Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

Handbook of Research on Digital Devices for Inclusivity and Engagement in Libraries

Adeyinka Tella
University of Ilorin, Nigeria

IGI Global
DISSEMINATOR OF KNOWLEDGE

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

Published in the United States of America by
IGI Global
Information Science Reference (an imprint of IGI Global)
701 E. Chocolate Avenue
Hershey PA, USA 17033
Tel: 717-533-8845
Fax: 717-533-8661
E-mail: cust@igi-global.com
Web site: http://www.igi-global.com

Copyright © 2020 by IGI Global. All rights reserved. No part of this publication may be reproduced, stored or distributed in any form or by any means, electronic or mechanical, including photocopying, without written permission from the publisher. Product or company names used in this set are for identification purposes only. Inclusion of the names of the products or companies does not indicate a claim of ownership by IGI Global of the trademark or registered trademark.

Library of Congress Cataloging-in-Publication Data

Names: Tella, Adeyinka, 1972- editor.
Title: Handbook of research on digital devices for inclusivity and engagement in libraries / Adeyinka Tella, editor.
Description: Hershey, PA : Information Science Reference, an imprint of IGI Global, [2020] | Includes bibliographical references. | Summary: "This book examines the development and transforming effects of information and communication technology on the use of interactive digital devices in libraries. It also explores how digital devices can be used for inclusivity and engagement in libraries"-- Provided by publisher.
Identifiers: LCCN 2019021164 | ISBN 9781522590347 (hardcover) | ISBN 9781522590361 (ebook)
Subjects: LCSH: Libraries--Information technology--Social aspects. | Libraries--Information technology--Nigeria. | Libraries--Communication systems. | Libraries--Communication systems--Nigeria. | Academic libraries--Information technology--Nigeria. | Digital media. | Mobile communication systems--Library applications. | Web services--Library applications.
Classification: LCC Z678.9 .H315 2020 | DDC 025.00285--dc23
LC record available at https://lccn.loc.gov/2019021164

This book is published in the IGI Global book series Advances in Library and Information Science (ALIS) (ISSN: 2326-4136; eISSN: 2326-4144)

British Cataloguing in Publication Data
A Cataloguing in Publication record for this book is available from the British Library.

All work contributed to this book is new, previously-unpublished material. The views expressed in this book are those of the authors, but not necessarily of the publisher.

For electronic access to this publication, please contact: eresources@igi-global.com.

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243



Advances in Library and Information Science (ALIS) Book Series

Alfonso Ippolito
Sapienza University-Rome, Italy
Carlo Inglese
Sapienza University-Rome, Italy

ISSN:2326-4136
EISSN:2326-4144

Mission

The **Advances in Library and Information Science (ALIS) Book Series** is comprised of high quality, research-oriented publications on the continuing developments and trends affecting the public, school, and academic fields, as well as specialized libraries and librarians globally. These discussions on professional and organizational considerations in library and information resource development and management assist in showcasing the latest methodologies and tools in the field.

The **ALIS Book Series** aims to expand the body of library science literature by covering a wide range of topics affecting the profession and field at large. The series also seeks to provide readers with an essential resource for uncovering the latest research in library and information science management, development, and technologies.

Coverage

- Library Budget Allocation
- Gaming in Libraries
- Collaborative Learning and Libraries
- Distance Learning and Librarianship
- Succession Planning in Libraries
- Remote Access Technologies
- RFID (Radio Frequency Identification)
- Discoverability of E-Content in Libraries
- Marketing Library Products and Services
- Librarian Education

IGI Global is currently accepting manuscripts for publication within this series. To submit a proposal for a volume in this series, please contact our Acquisition Editors at Acquisitions@igi-global.com or visit: http://www.igi-global.com/publish/.

The Advances in Library and Information Science (ALIS) Book Series (ISSN 2326-4136) is published by IGI Global, 701 E. Chocolate Avenue, Hershey, PA 17033-1240, USA, www.igi-global.com. This series is composed of titles available for purchase individually; each title is edited to be contextually exclusive from any other title within the series. For pricing and ordering information please visit http://www.igi-global.com/book-series/advances-library-information-science/73002. Postmaster: Send all address changes to above address. Copyright © 2020 IGI Global. All rights, including translation in other languages reserved by the publisher. No part of this series may be reproduced or used in any form or by any means – graphics, electronic, or mechanical, including photocopying, recording, taping, or information and retrieval systems – without written permission from the publisher, except for non commercial, educational use, including classroom teaching purposes. The views expressed in this series are those of the authors, but not necessarily of IGI Global.

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

Titles in this Series

For a list of additional titles in this series, please visit: www.igi-global.com/book-series

Handbook of Research on Transdisciplinary Knowledge Generation
Victor X. Wang (Liberty University, USA)
Information Science Reference • copyright 2019 • 475pp • H/C (ISBN: 9781522595311) • US $285.00 (our price)

Social Media for Communication and Instruction in Academic Libraries
Jennifer Joe (University of Toledo, USA) and Elisabeth Knight (Western Kentucky University, USA)
Information Science Reference • copyright 2019 • 319pp • H/C (ISBN: 9781522580973) • US $195.00 (our price)

Enhancing the Role of ICT in Doctoral Research Processes
Kwong Nui Sim (Victoria University of Wellington, New Zealand)
Information Science Reference • copyright 2019 • 278pp • H/C (ISBN: 9781522570653) • US $185.00 (our price)

Social Research Methodology and New Techniques in Analysis, Interpretation, and Writing
M. Rezaul Islam (University of Dhaka, Bangladesh & University of Malaya, Malaysia)
Information Science Reference • copyright 2019 • 320pp • H/C (ISBN: 9781522578970) • US $195.00 (our price)

Ethics in Research Practice and Innovation
Antonio Sandu (Stefan cel Mare University of Suceava, Romania) Ana Frunza (LUMEN Research Center in Social and Humanistic Sciences, Romania) and Elena Unguru (University of Oradea, Romania)
Information Science Reference • copyright 2019 • 373pp • H/C (ISBN: 9781522563105) • US $195.00 (our price)

Marginalia in Modern Learning Contexts
Alan J. Reid (Coastal Carolina University, USA)
Information Science Reference • copyright 2019 • 250pp • H/C (ISBN: 9781522571834) • US $175.00 (our price)

Scholarly Publishing and Research Methods Across Disciplines
Victor C.X. Wang (Grand Canyon University, USA)
Information Science Reference • copyright 2019 • 372pp • H/C (ISBN: 9781522577300) • US $195.00 (our price)

Advanced Methodologies and Technologies in Library Science, Information Management, and Scholarly Inquiry
Mehdi Khosrow-Pour, D.B.A. (Information Resources Management Association, USA)
Information Science Reference • copyright 2019 • 684pp • H/C (ISBN: 9781522576594) • US $275.00 (our price)



701 East Chocolate Avenue, Hershey, PA 17033, USA
Tel: 717-533-8845 x100 • Fax: 717-533-8661
E-Mail: cust@igi-global.com • www.igi-global.com

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

List of Contributors

Aba, Jane Igie / *Ambrose Alli University, Nigeria* 328, 350, 382
Adegbore, Adebayo Muritala / *University of Ibadan, Nigeria* 185
Adegun, Adekanmi A. / *Landmark University, Nigeria* 45, 93
Adewuyi, Kayode Wale / *Faith Academy Ilorin, Nigeria* 238
Afolabi, Abiola G. / *Michael Imoudu National Institute for Labour Studies, Nigeria* 45, 93
Afolayan, Joel O. / *Michael Imoudu National Institute for Labour Studies, Nigeria* 45, 93
Ajiboye, Olubukola Oluyemisi / *University of Ilorin, Nigeria* 70
Akinboro, Evelyn Olakitan / *University of Ilorin, Nigeria* 406
Alonge, Ayodele John / *University of Ibadan, Nigeria* 258
Amuda, Halimah Odunayo / *Al-Hikmah University, Nigeria* 278
Ayodeji, Ajani Yusuf / *Independent Researcher, Nigeria* 307
Bashorun, M. T. / *University of Ilorin, Nigeria* 113
Dahiru, Garba / *Abubakar Tafawa Balewa University, Nigeria* 113
Edam-Agbor, Imelda Barong / *University of Calabar, Nigeria* 278
Fagbola, Olaronke O. / *University of Ilorin, Nigeria* 135
Famuyiwa, Shola Temitope / *University of Ilorin, Nigeria* 307
Isah, Abdulmumin / *University of Ilorin, Nigeria* 297
Kowalsky, Michelle / *Rowan University, USA* 160
Makinde, Theresa Osasu / *Ambrose Alli University, Nigeria* 328, 350, 382
Mutula, Stephen / *University of KwaZulu-Natal, South Africa* 1
Mwageni, Rhodes Elias / *Teofilo Kisanji University, Tanzania* 25
Obinyan, Oluwatoyin Oyeyemi / *Ambrose Alli University, Nigeria* 371
Ochonogor, Wilson Chukwunedum / *University of KwaZulu-Natal, South Africa* 1
Ogundele, Olubunmi Ruth / *University of Ilorin, Nigeria* 297
Ogundokun, Roseline O. / *Landmark University, Nigeria* 45, 93
Okojie, Victoria / *University of Abuja, Nigeria* 208
Oladele, Muhammed Jamiyu / *University of Ilorin, Nigeria* 278
Olayinka, Taylor Morenikeji / *University of Ilorin, Nigeria* 406
Oluwaseun, Babarotimi Opeyemi / *National Open University of Nigeria, Nigeria* 135
Oluwatoyin, Oso / *Ajayi Crowther University, Nigeria* 208
Omopupa, K. T. / *University of Ilorin, Nigeria* 113
Onwuchekwa, Edeama O. / *National Open University of Nigeria, Nigeria* 231
Onyebinama, Colette Ogugua / *Federal University of Technology, Nigeria* 278, 307

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

Orim, Faith / *University of Calabar, Nigeria* 208
Quardri, Femi / *Federal Polytechnic, Nigeria* 70
Smart, Ambrose E. / *National Open University of Nigeria, Nigeria* 135
Sunday Segun Bamidele / *Kwara State College of Education, Nigeria* 70
Tella, Adeyinka / *University of Ilorin, Nigeria* 70, 208, 307

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

Table of Contents

Foreword xxi

Preface xxiii

Chapter 1
The Use of Social Media by Medical Librarians for Inclusive Engagement in the Management of HIV/AIDS in Nigeria University Teaching Hospitals 1
Wilson Chukwunedum Ochonogor, University of KwaZulu-Natal, South Africa
Stephen Mutula, University of KwaZulu-Natal, South Africa

Chapter 2
The Use of Digital Devices in Marketing Library Products in an Inclusively Engaged Academic Library 25
Rhodes Elias Mwageni, Teofilo Kisanji University, Tanzania

Chapter 3
Artificial Intelligence, Cloud Librarianship, and Infopreneurship Initiatives for Inclusiveness 45
Joel O. Afolayan, Michael Imoudu National Institute for Labour Studies, Nigeria
Roseline O. Ogundokun, Landmark University, Nigeria
Abiola G. Afolabi, Michael Imoudu National Institute for Labour Studies, Nigeria
Adekanmi A. Adegun, Landmark University, Nigeria

Chapter 4
Resource Sharing: Vehicle for Effective Library Information Dissemination and Services in The Digital Age 70
Adeyinka Tella, University of Ilorin, Nigeria
Femi Quardri, Federal Polytechnic, Nigeria
Sunday Segun Bamidele, Kwara State College of Education, Nigeria
Olubukola Oluyemisi Ajiboye, University of Ilorin, Nigeria

Chapter 5
Marketing Information Products and Services Through Digital Platforms: Tools and Skills 93
Roseline O. Ogundokun, Landmark University, Nigeria
Joel O. Afolayan, Michael Imoudu National Institute for Labour Studies, Nigeria
Adekanmi A. Adegun, Landmark University, Nigeria
Abiola G. Afolabi, Michael Imoudu National Institute for Labour Studies, Nigeria

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

Chapter 6
Cloud Computing and Academic Libraries in Nigeria 113
M. T. Bashorun, University of Ilorin, Nigeria
K. T. Omopupa, University of Ilorin, Nigeria
Garba Dahiru, Abubakar Tafawa Balewa University, Nigeria

Chapter 7
Application of Cloud Computing Technologies in Academic Library Management: The National Open University of Nigeria Library in Perspective 135
Olaronke O. Fagbola, University of Ilorin, Nigeria
Ambrose E. Smart, National Open University of Nigeria, Nigeria
Babarotimi Opeyemi Oluwaseun, National Open University of Nigeria, Nigeria

Chapter 8
School Librarian Experiences of Learning Management Implementation 160
Michelle Kowalsky, Rowan University, USA

Chapter 9
Digital Storytelling, Podcasting, and New Format of Messaging in the Libraries 185
Adebayo Muritala Adegbore, University of Ibadan, Nigeria

Chapter 10
Opportunities and Challenges of E-Book Readers and Mobile Devices in Libraries: Experiences From Nigeria 208
Victoria Okojie, University of Abuja, Nigeria
Faith Orim, University of Calabar, Nigeria
Oso Oluwatoyin, Ajayi Crowther University, Nigeria
Adeyinka Tella, University of Ilorin, Nigeria

Chapter 11
Library Signage and Information Graphics: A Communication Tool for Library Users 231
Edeama O. Onwuchekwa, National Open University of Nigeria, Nigeria

Chapter 12
New Tools, Gadgets, and Devices in Libraries 238
Kayode Wale Adewuyi, Faith Academy Ilorin, Nigeria

Chapter 13
Library Markers Space in Academic and Public Libraries 258
Ayodele John Alonge, University of Ibadan, Nigeria

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

Chapter 14
New Opportunities in Libraries: Open Access, Open Content, and Collection 278
Halimah Odunayo Amuda, Al-Hikmah University, Nigeria
Imelda Barong Edam-Agbor, University of Calabar, Nigeria
Muhammed Jamiyu Oladele, University of Ilorin, Nigeria
Colette Ogugua Onyebinama, Federal University of Technology, Nigeria

Chapter 15
Exploring the Use of Social Media as Tools for Information Sharing Among Undergraduates of University of Ilorin 297
Abdulmumin Isah, University of Ilorin, Nigeria
Olubunmi Ruth Ogundele, University of Ilorin, Nigeria

Chapter 16
Looking Beyond Now in Publishing: The Print vs. Digital Debate – What Should Be the Focus Content or Platform? 307
Ajani Yusuf Ayodeji, Independent Researcher, Nigeria
Adeyinka Tella, University of Ilorin, Nigeria
Shola Temitope Famuyiwa, University of Ilorin, Nigeria
Colette Ogugua Onyebinama, Federal University of Technology Owerri, Nigeria

Chapter 17
Utilization of Smartphones for Retrieving Research Information Resources in Libraries by Undergraduates 328
Jane Igie Aba, Ambrose Alli University, Nigeria
Theresa Osasu Makinde, Ambrose Alli University, Nigeria

Chapter 18
Use of Social Media in Libraries and Impact on Undergraduates 350
Jane Igie Aba, Ambrose Alli University, Nigeria
Theresa Osasu Makinde, Ambrose Alli University, Nigeria

Chapter 19
Application of Mobile Technologies in Library Service Delivery 371
Oluwatoyin Oyeyemi Obinyan, Ambrose Alli University, Nigeria

Chapter 20
Relevance of Web 2.0 for Library Services in Digital Era 382
Jane Igie Aba, Ambrose Alli University, Nigeria
Theresa Osasu Makinde, Ambrose Alli University, Nigeria

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

Chapter 21
Impact of Social Media Usage on Information Retrieval Among Undergraduate Students in Faculty of Management Sciences, University of Ilorin 406
Evelyn Olakitan Akinboro, University of Ilorin, Nigeria
Taylor Morenikeji Olayinka, University of Ilorin, Nigeria

Compilation of References 437

About the Contributors 482

Index 489

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

Detailed Table of Contents

Foreword xxi

Preface xxiii

Chapter 1
The Use of Social Media by Medical Librarians for Inclusive Engagement in the Management of HIV/AIDS in Nigeria University Teaching Hospitals 1
Wilson Chukwunedum Ochonogor, University of KwaZulu-Natal, South Africa
Stephen Mutula, University of KwaZulu-Natal, South Africa

Information and communication technologies (ICTs) have over the years evolved and synthesized to leverage a wide variety of tasks in all fields of human endeavor including library services. This rapid transformation has not only affected information handling procedures but has equally reshaped approach to the work environment in that librarians attached to medical libraries is required to acquire some knowledge of medicine in order to adequately and efficiently make informed decisions that can positively impact on the general medical practice and specifically the management of HIV/AIDS. The use of ICTs such as social media (SM) has further made the work environment a community pivot, a rallying point, rather than the solitary tedium that has retarded learning, communication, advancement, cooperation, and community support in the past. The internet has greatly influenced SM penetration into all aspects of library services especially in the medical library where community of users (CoUs) can converge, confer and proffer simplified work output, better doctor-patient relationship and effective treatment. Hence, for effective implementation of SM in Nigeria university teaching hospitals, there is the need for the following to be put into consideration: formulation of online groups; schedule of regular updating of the site and contact information; simplification of keywords for easy content search and profiling; need to always inform members of current items, creating novel ideas as cleverly and satisfying as possible, need to widen out or reach others with novelties, advancement, activities, current drugs for specific ailments, and resistivedrugs.

Chapter 2
The Use of Digital Devices in Marketing Library Products in an Inclusively Engaged Academic Library 25
Rhodes Elias Mwageni, Teofilo Kisanji University, Tanzania

This chapter scrutinizes and identifies critical issues in the use of digital devices, opportunities and challenges in marketing library products and services in academic libraries. It surveys and examines empirical literature as a review method on the use of digital devices in an engaged academic libraries

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

in marketing library products and services. From the findings, it was revealed that library products and services are underutilized because of lack of marketing strategies and programmes to create awareness of available resources and services in academic libraries. This resulted from negative attitude and behaviours towards reading culture among library users. The implications of this study is in the operations of academic libraries in various academic institutions and the community at large. This made easier accessibility of information and to retain library users to visit and use library products and services. Digital devices transform and widening up the reach, management, storage and delivery. It diversifies library users' demands stimulated by developments of technologies. Also, digital devices make library products and services more interactive hence maximize utilization of library products and services. They influenced attitudes, behaviours and perceptions of library users into a positive reading habits. Therefore, there is a great need to employ digital devices in marketing library products and services in academic libraries. The challenges involve library users' over expectations, diverse needs, wants and choices emanated from technological evolutions, poor ICT infrastructures, insufficient bandwidth, lack of knowledgeable librarians and copyright and intellectual property rights. Also, wide digital split in developing countries compared to developed world and the threats of technologies to librarianship which make librarians to remain redundant and their roles being replaced by digital devices.

Chapter 3
Artificial Intelligence, Cloud Librarianship, and Infopreneurship Initiatives for Inclusiveness..... 45
Joel O. Afolayan, Michael Imoudu National Institute for Labour Studies, Nigeria
Roseline O. Ogundokun, Landmark University, Nigeria
Abiola G. Afolabi, Michael Imoudu National Institute for Labour Studies, Nigeria
Adekanmi A. Adegun, Landmark University, Nigeria

Artificial intelligence (AI) is a broad and complex area of study, which can be difficult for non-specialists to understand. Yet, its ultimate promise is to create computer systems that manifest human intelligence. This chapter coins 'Machinzation' for the application of literary machine (computer) to human operations. This clearly has major implications for library and information science profession. In principle and practice, AI has penetrated virtually all walks of human life. Many authors have previously provided in-depth overviews of AI technologies. Service is the vocal point of librarianship and particularly in the era where information is the fifth and most important factor of production. Cloud computing stems from the principle of AI while when applied into the operations and routines in libraries and information centre gives a brand new concept 'Cloud Librarianship'. The new concept is dealt with in this work. Emergence of this concept opens up the entrepreneur opportunities in the information sector of the economy-Inforpreneurship. This chapter therefore examines certain key aspects of AI that determine its potential utility as a tool for enhancing and supporting library operations. It reviews the possible areas in which AI is applicable in librarianship, with a glimpse into areas like expert systems, intelligent computer-assisted instruction, and natural language applications. Also the infopreneural opportunities are also highlighted for eventual adoption. Some of the barriers that inhibit the infopreneursip are not left out. It also gives facility to induce new applications quickly without having to focus on identifying available server space or configuration and information technology-based library services can be delivered much more quickly than when using local-based hardware or software.

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

Chapter 4
Resource Sharing: Vehicle for Effective Library Information Dissemination and Services in The Digital Age 70
Adeyinka Tella, University of Ilorin, Nigeria
Femi Quardri, Federal Polytechnic, Nigeria
Sunday Segun Bamidele, Kwara State College of Education, Nigeria
Olubukola Oluyemisi Ajiboye, University of Ilorin, Nigeria

The chapter examined resource sharing as vehicle for effective library information dissemination and services in the digital age. In relation to this purpose, Studies have shown that the global information explosion, the cut in library budgetary allocations, the rising costs and complexities of information resources as well as the need to provide the user community with optimal access to needed information make resource sharing initiatives indispensable particularly among academic libraries for effective information dissemination and service delivery in the digital age. However, certain questions remained unanswered in the literature regarding resource sharing. They include, How can libraries engage in effective dissemination of information to the clientele through resource sharing? How can resource sharing result to effective service delivery in academic library? Is there a reflection of resource sharing in Nigeria? What is the nature of resource sharing in this digital age? What does the future hold regarding resource sharing in academic libraries and what are the issues/challenges associated with resource sharing by academic libraries in the digital age? It is expected that this chapter will provide answers to all these pertinent questions.

Chapter 5
Marketing Information Products and Services Through Digital Platforms: Tools and Skills 93
Roseline O. Ogundokun, Landmark University, Nigeria
Joel O. Afolayan, Michael Imoudu National Institute for Labour Studies, Nigeria
Adekanmi A. Adegun, Landmark University, Nigeria
Abiola G. Afolabi, Michael Imoudu National Institute for Labour Studies, Nigeria

Library and information science (LIS) have developed gradually over a period of time taking the opportunity of technology being spread widely. Library management system (LMS) is one of such earlier areas where ICT have been applied to the operations of the library. LSM will allow librarians to be keeping greater restriction over data stores and applications containing delicate, secretive, confidential or unrevealing information about customers, products, clients. The emergence of cloud computing is creating a new area of research in relation to libraries. Cloud computing is being influenced by the developers of library systems to facilitate the possibility of moving away from ILS/LMS called library services platforms (LSP). This chapter reviewed cloud computing, it uses, cloud computing in libraries and projects LSPS, Market Information products and services, identified the available digital platforms and makes appropriate and relevant recommendations.

Chapter 6
Cloud Computing and Academic Libraries in Nigeria 113
M. T. Bashorun, University of Ilorin, Nigeria
K. T. Omopupa, University of Ilorin, Nigeria
Garba Dahiru, Abubakar Tafawa Balewa University, Nigeria

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

The advent of computers and other communication technologies led to major transformations in the ways library services are rendered and the profession practiced. The libraries have been automated, networked and now moving towards paperless or virtual libraries. This chapter examines various facets of cloud computing, describes types and applications. It also outlines the benefits and challenges of cloud computing in academic libraries. Further, the chapter gives direction about the use of cloud computing services to the library professionals and academic libraries in Nigeria. This chapter may be helpful in generating cloud based services for academic libraries. The chapter suggests that quality service assurance by cloud providers must be ensured, upgrading of internet bandwidth for fast access and quick information dissemination that would improve academic library services. It concludes that cloud computing are crucial and vital in modern information innovation especially in academic libraries.

Chapter 7
Application of Cloud Computing Technologies in Academic Library Management: The National Open University of Nigeria Library in Perspective 135
Olaronke O. Fagbola, University of Ilorin, Nigeria
Ambrose E. Smart, National Open University of Nigeria, Nigeria
Babarotimi Opeyemi Oluwaseun, National Open University of Nigeria, Nigeria

Cloud computing is an umbrella term used to describe a category of sophisticated on-demand computing services. Libraries generally have been adopting cloud-based solutions for different services such as electronic journal access management, integrated library system (ILS) hosting, electronic databases, digital library hosting, and cloud OPAC. This chapter discusses how cloud computing technology tools can be deployed to ensure uniformity in library services and standard of information resources available to students at all the study centers spread across the six geo-political zones. The chapter concludes that cloud computing offers many opportunities for academic libraries, and especially for the NOUN Library.

Chapter 8
School Librarian Experiences of Learning Management Implementation 160
Michelle Kowalsky, Rowan University, USA

This case will describe a school librarian's experiences in assisting the faculty and staff of a public high school as they attempted to adopt school-wide learning management system. A compelling example of change management, this initiative describes solutions to challenges common to many types of schools and libraries. This installation served as a local and early solution in developing teachers' skill in online learning management and asynchronous communication with students outside of school hours. Details include the conditions and procedures of the Moodle implementation, the leadership philosophies which facilitated collaboration, and the change dynamics at the school which led to a successful outcome.

Chapter 9
Digital Storytelling, Podcasting, and New Format of Messaging in the Libraries 185
Adebayo Muritala Adegbore, University of Ibadan, Nigeria

This chapter discusses how to transform storytelling, oral information, oral archiving and oral communication and other traditional formats of communication in libraries into digital formats. Information and communication technologies have changed how libraries communicate and render services as hitherto done traditionally. The conversion of traditional storytelling, oral information and the communication services of the library to digital storytelling, podcasting and instant messaging are dealt with in this

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

chapter. The chapter looks at traditional storytelling, traditional folklore, oral information and information dissemination in libraries. It also defined digital storytelling, values of digital storytelling in libraries, digital storytelling creation guidelines for libraries, podcasting and the importance of podcasting in libraries, steps in creating podcast for libraries, instant messaging in information dissemination in libraries, what libraries should know before implementing instant messaging, implementing IM in libraries, best practices for IM in libraries and more resources on instant messaging for libraries. The chapter is handy for libraries that are willing to transform some traditional services to digital driven practices.

Chapter 10
Opportunities and Challenges of E-Book Readers and Mobile Devices in Libraries: Experiences From Nigeria 208
Victoria Okojie, University of Abuja, Nigeria
Faith Orim, University of Calabar, Nigeria
Oso Oluwatoyin, Ajayi Crowther University, Nigeria
Adeyinka Tella, University of Ilorin, Nigeria

There is a common saying that "books are the windows to the world". Despite the fact that in this digital age the leading role is taken by the internet, books still play their part as openings to the vast knowledge. It is no longer news that changes have been brought to the book world due to the development in modern technology. As we have printed contents, so also are digital version of books or e-books which can be read on any digital devices with e-book reader applications installed. This development has enable people to bring library into their pockets. It has also resulted to a number of opportunities and associated challenges although these vary from developed and developing environment experiences. In the light of these, this chapter sought to examine based on experience from Nigeria, mobile devices and libraries - identified the mobile devices now integrated with library services, the use of e-book readers and mobile devices for reading - types and forms of e-book reader, future potentials of mobile application in the libraries, opportunities associated with e-book reader and mobile devices; mobile devices and e-reader in the libraries: experiences from Nigeria; challenges associated with the use of e-book reader and mobile devices and the way forward towards promoting the use of e-book readers and mobile devices for reading in the Nigeria.

Chapter 11
Library Signage and Information Graphics: A Communication Tool for Library Users 231
Edeama O. Onwuchekwa, National Open University of Nigeria, Nigeria

Libraries are gradually becoming spaces for discovery, innovation and community empowerment by catering to the various needs of the public. To harness the unlimited resources in the library, library digital signage is the perfect tool to help transform old buildings and spaces into a place of collaboration and innovation. Since it's a content-centric solution at its core, digital signs can go beyond looping a series of pictures. It's an intelligent tool that cans tailor-fit content relative to the audience, location, time of the day and even process. This chapter will address the different roles of signages and buttress the fact that Digital signage can play a major role in this communication process in addition to demonstrating a "green" environment for library patrons. Graphic Information can be displayed to the public in meeting rooms, at the front desk, in vestibules or cafeterias/cafes. The messaging can range from programs being held at the library to public service announcements to emergency messaging and so much more. There is no limit to the information that a library signage can convey to its users.

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

Chapter 12
New Tools, Gadgets, and Devices in Libraries 238
Kayode Wale Adewuyi, Faith Academy Ilorin, Nigeria

The internet explosions, proliferation of online resources and the advent of free and open access resources in the last two decades provided the much needed impetus for libraries to inject new energy into providing quality service delivery of its services. More and more applications and databases are being provided to the libraries as mobile products. This chapter that focuses on new tools, gadgets, and devices in the libraries; summarizes, to some extent and expatiate to a large extent, the various new tools, devices and gadgets operational and adaptable to various aspects of librarianship and sections of the librarians. After an exploration of how these devices and tools work, and the different types, the author provided a comparison of current popular products, followed by a look at some of the new tools, gadgets and devices that we have available (toand around us). With the awareness that we are in the midst of an ongoing information revolution, the internet and personal computing are key components of this transition,and has tremendous potential to transform library services. In this chapter, all tools/devices and gadgets therefore, will be analyzed with an eye towards the future, cost-effectiveness, performance and functionality.

Chapter 13
Library Markers Space in Academic and Public Libraries 258
Ayodele John Alonge, University of Ibadan, Nigeria

This study examines the library markers space in academic and public libraries. These spaces are specifically designed, aimed at meeting the unexpressed needs of library users and to influence them to profitably engage in the library by creating physical or digital objects, which are open for the free use of all library users. Library makers space enables graphic arts, web design and animation and assists students in their projects that involve digital images. Nevertheless, factors such as lack of technical skills, inadequate power supply and lack of trained manpower distort the application of Library Markers Space in academic and public libraries.

Chapter 14
New Opportunities in Libraries: Open Access, Open Content, and Collection 278
Halimah Odunayo Amuda, Al-Hikmah University, Nigeria
Imelda Barong Edam-Agbor, University of Calabar, Nigeria
Muhammed Jamiyu Oladele, University of Ilorin, Nigeria
Colette Ogugua Onyebinama, Federal University of Technology, Nigeria

The emergence of Open Access initiative is one of the most significant changes to the world of scholarly publications since the migration from print to digital publishing began. Reports of some authors have demonstrated how libraries across the membership are changing, in response to a need for new services and an increasingly diverse client group. In order to contribute to the existing knowledge in the area of open access movement in libraries, this chapter discusses how the 21st century library provides a service that can open access to knowledge for the growth and development of communities they serve by highlighting the concept of open access and open content, roles of libraries in open access initiative as well as library collection development and open access. This chapter also sheds light on legal & ethical issues in open access and the future of open access in Libraries.

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

Chapter 15
Exploring the Use of Social Media as Tools for Information Sharing Among Undergraduates of University of Ilorin..... 297
Abdulmumin Isah, University of Ilorin, Nigeria
Olubunmi Ruth Ogundele, University of Ilorin, Nigeria

The emergence of social media in the 21st century has revolutionized social interaction among individuals and groups beyond the physical and geographical boundary. Social media tools such as Facebook, Whatsapp, Twitter, MySpace, Skype, Messengers, etc. have affected our traditional face-to-face interaction. It has facilitated extensive communication and sharing of knowledge in the society in general and schools in particular. In the academic field, social media serves as a powerful tool for communication. This chapter, therefore, explores the use of social media for sharing information among undergraduate students. The research design adopted was a descriptive survey. A pre-tested questionnaire was employed for data collection. Out of three hundred and fifteen (315) copies of the questionnaire administered to students of Faculty of Communication and Information Sciences of the University of Ilorin, three hundred (300) was returned, however, two hundred and ninety (290) copies of the returned questionnaire was found useful for the study. The data obtained were analyzed using simple percentages and frequency counts. The findings of the study show that students make use of social media tools for chatting and exchanging information aside academic dealings. It also revealed that the majority of respondents 242 (83.4%) use social media for obtaining research information. In addition, the findings also revealed that majority of the respondents 283 (97.6%) use Facebook for posting and sharing information, and a considerable amount respondents (260 (89.7) also agreed that WhatsApp is used for sharing information and useful documents. The study concluded with recommendations on the need to educate students on the negative influence of social media and also to strike balance between chitchatting and academic activities.

Chapter 16
Looking Beyond Now in Publishing: The Print vs. Digital Debate – What Should Be the Focus Content or Platform?..... 307
Ajani Yusuf Ayodeji, Independent Researcher, Nigeria
Adeyinka Tella, University of Ilorin, Nigeria
Shola Temitope Famuyiwa, University of Ilorin, Nigeria
Colette Ogugua Onyebinama, Federal University of Technology Owerri, Nigeria

The chapter emphasises that due to digital revolution there have been lot of development in the publishing industry and this has also affect access to and dissemination of information. The issue about print and digital debate is now common everywhere. However, the question about what the focus should be whether the content or the platform is yet to be answered. While some believe that digital revolution will continue giving room for digital publishing to thrive, others are saying that it is not the platform that matters but rather the contents which should made available to the users when needed. Based on this background, this chapter of the book discussed the historical background of digital publishing, digital publishing initiatives, advantages and disadvantages of digital publishing, challenges associated with digital publishing, the print and the digital debate, looking beyond now: in terms of what the future holds for publishing? The chapter concludes by indicating that annexing new and emerging technologies by authors, publishers and librarians to get the contents across to the various audiences should be the target. This is because the era we are going into 'the internet of thing' is an era whereby everything related to contents and information will be dictated by technologies.

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

Chapter 17
Utilization of Smartphones for Retrieving Research Information Resources in Libraries by Undergraduates 328
Jane Igie Aba, Ambrose Alli University, Nigeria
Theresa Osasu Makinde, Ambrose Alli University, Nigeria

The chapter examined the utilization of smart phones for retrieving research information resources in libraries by undergraduates. The study covers awareness, utilization; benefits, effects and constraints that affect smart phones for retrieving research information resources by undergraduates. These concepts generally implied that awareness facilitates interest for use. It was concluded that smartphone were used by undergraduate students to retrieve research information resources and this had positive impact on research out of students will produce positive impact on academic performance of students. It was recommended among others that efforts should be made by the university to inculcate mobile teaching and learning curriculum in to the school syllabuses at the various levels, and library staff, lecturers and university staff generally should be sensitized and trained in the use of mobile devices for teaching and learning.

Chapter 18
Use of Social Media in Libraries and Impact on Undergraduates 350
Jane Igie Aba, Ambrose Alli University, Nigeria
Theresa Osasu Makinde, Ambrose Alli University, Nigeria

This chapter examined the use of social media in libraries and impact on undergraduates. The chapter covers concepts of utilization of social media; benefits, impact and challenges that affect the use of social media and academic performance of undergraduate students. The concepts generally implied that social media is the use of technology as the best medium to explore wide area of knowledge to produce positive impact on academic performance of students. Social media usage is beneficial to academic performance of students. It was recommended among others that awareness programmes of use of social media platforms should be provided by the university and library to students, access to use of social media resources and services by librarians should be provided to students; educational forums that will facilitate group collaboration and discussion on academic performance should be promoted in universities, connectivity to social media network sites and internet should be improved to facilitate instant information search by students.

Chapter 19
Application of Mobile Technologies in Library Service Delivery 371
Oluwatoyin Oyeyemi Obinyan, Ambrose Alli University, Nigeria

The chapter emphasised the rapid advancement in technology in last two decades, mainly because of the advent of Internet, the world no longer works the same. The chapter explains that the advent of wireless networks and more recently mobile devices such as smart phones, tablets etc. following the internet, contributed a lot their applicability in library's operations. As contained in extant literature, mobile devices have become a very important part of communication not only for telephone service users but also for the internet users. The two main reasons behind success of mobile technology is the benefits such as mobility and ubiquity served by mobile devices. It is on that that the chapter explores the application of mobile technology on service delivery in libraries, the advantages and disadvantages, also highlighted were the skills required by the librarians in incorporating mobile technologies to library services.

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

Chapter 20
Relevance of Web 2.0 for Library Services in Digital Era 382
Jane Igie Aba, Ambrose Alli University, Nigeria
Theresa Osasu Makinde, Ambrose Alli University, Nigeria

The chapter examined relevance of Web 2.0 for library services in digital era. it has been concluded that Web 2.0 tools play crucial role in effective service delivery of librarians. The chapter covers awareness, utilization; benefits and challenges that affect the use of Web 2.0 by librarians for effective service delivery. The concepts generally implied that Web 2.0 can be used by librarians as information acquisition tools that are used to gather information from sources outside libraries (for example, blogs and wikis), information dissemination tools that are used to distribute content and information to patrons (such as RSS feeds), information organization tools that facilitate storage and subsequent retrieval of information (social bookmarking and tagging), and information sharing tools that facilitate the bilateral flow of information between libraries and patrons (social networking and media sharing sites. It was concluded that Web 2.0 tools play crucial role in effective service delivery of librarians. Therefore, librarians should be proactive in the adoption and use of upgrade of web 4.0 which is more current than Web 2.0 to become relevant in the digital era.

Chapter 21
Impact of Social Media Usage on Information Retrieval Among Undergraduate Students in Faculty of Management Sciences, University of Ilorin 406
Evelyn Olakitan Akinboro, University of Ilorin, Nigeria
Taylor Morenikeji Olayinka, University of Ilorin, Nigeria

The study examined the impact of social media on information retrieval among undergraduate students in the Faculty of Management Sciences, University of Ilorin. It determined the social media network that undergraduate students were more exposed to for retrieving information, identified the differences in their usage of social media network for information retrieval based on gender and age brackets, explored preferences for social media compared to other sources of information retrieval systems available for students, explored the types of information retrieved from social media network, and identified the challenges they faced in the use of social media networks. The population of the study comprised of 3,634 students out of which a sample of 360 was chosen through stratified random technique. A self-designed questionnaire was used to collect data. Five research questions were developed and answered by the study. The findings revealed that undergraduate students exposure to social media was very high. The social media tools where students exposure was highest was WhatsApp application compared to any other social media platform. Students preferred using social media platforms to retrieve information than using conventional resources like textbooks, journals, etc. There was a negligible difference between social media exposure level of male gender and female gender. Furthermore, the study revealed that undergraduate students level of exposure varied by age brackets while those within age bracket 21-25 years have the highest level of exposure. The study also demonstrated that a higher percentage of students like using social media platforms to retrieve information on the latest update of school activities and to gratify their needs in entertainment. The major challenge faced by students is the high cost of access to social media platforms (subscription). The study recommended that the students exposure to and bias preference for social media over other available information retrieval systems should be controlled.

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

Compilation of References 437

About the Contributors 482

Index 489

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

Foreword

Prof. Tella has requested me to write the foreword to this very important book. It is gratifying to write a Foreword for such a prolific researcher's book, who has made a significant contribution to this scholarly world in a short time. Some of his achievements include: recognized as no 1 scientist in his University in Nigeria by Webometrics in March, 2015 and a three times winner of the prestigious Dr. T.M. Salisu award for the Most Published Librarian for the year 2015, 2017 and 2018 by the Nigerian Library Association. He has 8 books included 4 edited book and this being the 5th edited book and has published extensively in several peer reviewed national and international Web of Science/Scimago ranked journals. No doubt about the credibility of the book.

Rapid advancement of technology has transformed the information environment entirely. The penetration of digital technologies has made it easier for both information professionals and library users. Users prefer and thrive in a digitized environment. Digital platforms and digital devices have become central to all types of twenty-first century libraries and information centers. Social media platforms and different digital devices, such as, tablets, self-service scanners, digital signage, digital lockers, MakerSpace,3D printers and 3D scanners, cloud computing are used in libraries to optimize library services in the Digital Milieu. Hence, libraries spend huge amount of budgets to acquisitions of digital devices and e-resources.

This book titled *Handbook of Research on Digital Devices for Inclusivity and Engagement in Libraries* explores the use and benefits of digital devices in several ways focusing on inclusivity and engagement in libraries, such as, use of social media by medical librarians for inclusive engagement; use of digital devices for marketing library products; use of artificial intelligence; cloud librarianship and infopreneurship initiatives for inclusiveness; resource sharing; learning management and library collection enhancement. The book provides an array of observations and insights, from authors in Nigeria, Tanzania, USA, and South Africa.

Wilson Chukwunedum Ochonogor and Stephen Mutula from University of Kwazulu-Nata, South Africa kicks off the book by examining the use of social media by medical librarians for inclusive engagement in the management of HIV/AIDS in Nigeria university teaching hospitals. Many authors including Elias Mwagen, Teofilo Kisanji University Tanzania and Roseline O. Ogundokun, Joel O. Afolayan, Michael Imoudufrom Nigeria have investigated the use of digital devices in marketing library products in an inclusively engaged academic library. Joel O. Afolayan et al from Nigeria examine Artificial intelligence, cloud librarianship and infopreneurship initiatives for inclusiveness.

Tella, Adeyinka, Femi Quardri, Bamidele, Sunday Segun, and Ajiboye, Olubukola Oluyemisi from Nigeria embark on resource sharing vehicle for effective library information dissemination and services in the digital age, while Abdulmumin Isah from University of Ilorin, Nigeria examine the use of social media as tools for information sharing among undergraduates of university of Ilorin.

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

Several authors have explored use of cloud computing, for example, M.T. Bashorun, and K.T. Omopupa from the University of Ilorin, Nigeria, GarbaDahiru, Abubakar Tafawa Balewa University (ATBU), Bauchi, Nigeria examine cloud computing and academic libraries in Nigeria, while Olaronke O. Fagbola, University of Ilorin, Nigeria, Ambrose Smart, National Open University of Nigeria, Abuja, Nigeria, Babarotimi Opeyemi Oluwaseun, National Open University of Nigeria, Abuja, Nigeria assess the application of Cloud Computing Technologies in Academic Library Management at the National Open University of Nigeria Library in Perspective.

Michelle Kowalsky, from Rowan University, USA shares his School Librarian's experiences of Learning Management Implementation. Adebayo Muritala Adegbore from the University of Ibadan examines the use of Digital Storytelling, Podcasting and New Format of Messaging in the Libraries. Victoria Okojie, University of Abuja, Faith Orim, University of Calabar, Oluwatoyin Oso, Ajayi Crowther University, and Adeyinka Tella, University of Ilorin, Nigeria identify the Opportunities and challenges of e-book readers and mobile devices in libraries based on experiences from Nigeria.

Edeama O. Onwuchekwa from the United State of America Library deliberate on signage and Information Graphics as a communication tool for library users. Kayode Wale, Adewuyi, Faith Academy Ilorin, Kwara State from Nigeria discuss the new tools, gadgets and devices in libraries. Ayodele Alonge from University of Ibadan explores the Markerspace as motivating, engaging spaces in libraries and information centers.

Halimah Odunayo. Amuda, AlHikma Univrsity, Ilorin, Imelda Barong Edam-agbor University of Calabar, and Muhammed Jamiyu Oladele, University of Ilorin, Nigeria investigate open access, open contents and collections as new opportunities in libraries. Yusus Ayodeji Ajani, Tella, Adeyinka and Shola Temitope Famuyiwa from University of Ilorin debate on the print versus digital publishing answer what should be the focus, contents or platform? Other chapters featured in the book are Utilization of Smartphones for Retrieving Research Information Materials in the Libraries by Undergraduate Students, Use of social media in the libraries and impact on undergraduate students, Application of mobile technologies for service delivery in libraries and Relevance of web 2.0 for library services in digital era. Finally, in the last chapter of the book, Akinboro and Taylor look at the Impact of social media usage on information retrieval among undergraduate student in faculty of management sciences, University of Ilorin, Nigeria.

Thus, the book has observed assessed the digital devices for inclusivity and engagement in libraries from different perspectives. Notably, the 21 chapters of the book basically presents the current library environment of use of digital devices for inclusivity and engagement in libraries. The authors of this volume present analysis, and recommendations on the use of digital devices, that will help us make progress on these issues.

Priti Jain
University of Botswana, Botswana

Priti Jain *is a Professor of Information and Knowledge Management in the Department of Library and Information Studies at the University of Botswana. She holds BA (Hons) and LLB degrees from Meerut University, India, a Master's in Library and Information Studies from the University of Botswana, and a DLit et Phil (Doctor of Literature and Philosophy) from UNISA, South Africa. In her 16 years' working experience in Library and information world, Priti has written extensively in referred journals and has presented several papers in international conferences. She serves on five editorial boards in international journals. She is engaged in various community initiatives. She teaches and researches in knowledge management and information Science courses. Her current areas of research interest are: Knowledge management, Open access, Institutional Repositories, and Digital Scholarship.*

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

Preface

The rapid advances taking place in information and communication technologies is enabling transformation in libraries irrespective of their types. Libraries the world over have been undergoing massive technology shift, and digital signage is playing a big role in this transformation. What used to be an isolated and sedate environment has become more of a community hub where people interact, learn and communicate together. The internet has helped libraries connect to a worldwide network, where information is exchanged globally and consumed locally.

The switch from printed, static signs to interactive digital signage displays has helped libraries engage with visitors. Content is updated in real-time so people always know which events are coming up. Touch-enabled displays let visitors find their way around large buildings using interactive maps and way finding applications. Books with RFID tags trigger content on nearby displays to help people find related reading material. Displays connected to various sensors and automated systems can display evacuation notices, alarms or other useful live messages to visitors so they can safely exit the building in case of fire or other emergency. Digital interactive display is helping the library clienteles to say informed, entertained and motivated throughout their visit to the library.

This book therefore involves discussion on how development in information and communication technology has enabled the use of interactive digital display in libraries and the bigger roles it is playing in transforming the libraries. This comprehensive, timely and seasoned publication aims to be an essential reference source which will drive the use of interactive digital display in libraries and the bigger roles it is playing. The book discusses how digital devices can be used for inclusivity and engagement in libraries.

There are 21 major chapters in the book. These chapters detailed the contents represented in the book and more importantly, they appeal to readers to read along and enjoy the piece.

The book commences with a chapter that examines the use of social media by medical librarians for inclusive engagement in the management of HIV/AIDS in Nigeria university teaching hospitals. The chapter emphasises that the internet has greatly influenced SM penetration into all aspects of library services especially in the medical library where community of users (CoUs) can converge, confer and proffer simplified work output, better doctor-patient relationship and effective treatment. For this reason, the author pointed out that, there is need for effective implementation of SM in Nigeria university teaching hospitals. Parts of the suggestions include formulation of online groups; schedule of regular updating of the site and contact information; simplification of keywords for easy content search and profiling; need to always inform members of current items, creating novel ideas as cleverly and satisfying as possible, need to widen out or reach others with novelties, advancement, activities, current drugs for specific ailments, and resistive drugs.

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

The chapter that follows scrutinizes and identifies critical issues in the use of digital devices, opportunities and challenges in marketing library products and services in academic libraries. It surveys and examines empirical literature as a review method on the use of digital devices in an engaged academic libraries in marketing library products and services. From the findings, the chapter reveals that library products and services are underutilized because of lack of marketing strategies and programmes to create awareness of available resources and services in academic libraries. This resulted from negative attitude and behaviours towards reading culture among library users. The chapter suggests there is a great need to employ digital devices in marketing library products and services in academic libraries.

The next chapter looks at artificial intelligence (AI), cloud librarianship and infopreneurship initiatives for inclusiveness in libraries. The chapter examines certain key aspects of AI that determine its potential utility as a tool for enhancing and supporting library operations. It reviews the possible areas in which AI is applicable in librarianship, with a glimpse into areas like expert systems, intelligent computer-assisted instruction, and natural language applications. Also the infopreneural opportunities are also highlighted for eventual adoption. Some of the barriers that inhibit the infopreneursip are not left out.

Following this chapter is the discussion on resource sharing as vehicle for effective library information dissemination and services in the digital age. The chapter emphasizes that studies have shown that the global information explosion, the cut in library budgetary allocations, the rising costs and complexities of information resources as well as the need to provide the user community with optimal access to needed information make resource sharing initiatives indispensable particularly among academic libraries for effective information dissemination and service delivery in the digital age. The chapter claims that, certain questions remained unanswered in the literature regarding resource sharing. Such question as indicated in the chapter include: how can libraries engage in effective dissemination of information to the clientele through resource sharing?, how can resource sharing result to effective service delivery in academic library?, Is there a reflection of resource sharing in Nigeria?, what is the nature of resource sharing in this digital age?, what does the future hold regarding resource sharing in academic libraries and what are the issues/challenges associated with resource sharing by academic libraries in the digital age?. The chapter provides answers to all these pertinent questions.

The next chapter addresses marketing information products and services through digital platform: tools and skills. The chapter emphasized that library and Information Science (LIS) have developed gradually over a period of time taking the opportunity of technology being spread widely. Library Management System (LMS) is one of such earlier areas where ICT have been applied to the operations of the library. LSM will allow librarians to be keeping greater restriction over data stores and applications containing delicate, secretive, confidential or unrevealing information about customers, products, clients. The emergence of Cloud Computing is creating a new area of research in relation to libraries. Cloud computing is being influenced by the developers of library systems to facilitate the possibility of moving away from ILS/LMS called Library Services Platforms (LSP). On that notes, the chapter reviews cloud computing, discusses it uses in the library, looks at cloud computing and projects LSPS, discusses market information products and services.

The following related chapter looks at cloud computing and academic libraries in Nigeria. The chapter examines various facets of cloud computing, describes types and applications. It also outlines the benefits and challenges of cloud computing in academic libraries. Further, the chapter gives direction about the use of cloud computing services to the library professionals and academic libraries in Nigeria. The author of the chapter emphasised that it may be helpful in generating cloud based services

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

for academic libraries. The chapter suggests that quality service assurance by cloud providers must be ensured, upgrading of internet bandwidth for fast access and quick information dissemination that would improve academic library services. It concludes that cloud computing are crucial and vital in modern information innovation especially in academic libraries.

Preceding the two previous similar chapters is the chapter that discusses how cloud computing technology tools can be deployed to ensure uniformity in library services and standard of information resources available to students at all the study centres of Nigeria National Open University spread across the six geo-political zones. The chapter concludes that cloud computing offers many opportunities for academic libraries, and especially for the NOUN Library.

The school librarian's experiences of learning management implementation was the subject of discussion in the following chapter of the book. The chapter describes a school librarian's experiences in assisting the faculty and staff of a public high school as they attempted to adopt school-wide learning management system. A compelling example of change management, this initiative describes solutions to challenges common to many types of schools and libraries. This installation served as a local and early solution in developing teachers' skill in online learning management and asynchronous communication with students outside of school hours. Details include the conditions and procedures of the Moodle implementation, the leadership philosophies which facilitated collaboration, and the change dynamics at the school which led to a successful outcome.

Following the chapter is the discussion on how to transform storytelling, oral information, oral archiving and oral communication and other traditional formats of communication in libraries into digital formats. The chapter looks at traditional storytelling, traditional folklore, oral information and information dissemination in libraries. It also defined digital storytelling, values of digital storytelling in libraries, digital storytelling creation guidelines for libraries, podcasting and the importance of podcasting in libraries, steps in creating podcast for libraries, instant messaging in information dissemination in libraries, what libraries should know before implementing instant messaging, implementing IM in libraries, best practices for IM in libraries and more resources on instant messaging for libraries. The chapter is handy for libraries that are willing to transform some traditional services to digital driven practices.

The chapter that follows emphasizes that there is a common saying that "books are the windows to the world". Despite the fact that in this digital age the leading role is taken by the internet, books still play their part as openings to the vast knowledge. It is no longer news that changes have been brought to the book world due to the development in modern technology. In the light of these, this chapter sought to examine based on experience from Nigeria, mobile devices and libraries - *identified the mobile devices now integrated with library services, t*he use of e-book readers and mobile devices for reading - types and forms of e-book reader, future potentials of mobile application in the libraries, opportunities associated with e-book reader and mobile devices; mobile devices and e-reader in the libraries: experiences from Nigeria; challenges associated with the use of e-book reader and mobile devices and the way forward towards promoting the use of e-book readers and mobile devices for reading in the Nigeria.

The next chapter addresses the different roles of signages and buttress the fact that Digital signage can play a major role in this communication process in addition to demonstrating a "green" environment for library patrons. Graphic Information can be displayed to the public in meeting rooms, at the front desk, in vestibules or cafeterias/cafes. The messaging can range from programs being held at the library to public service announcements to emergency messaging and so much more. The chapter points out that there is no limit to the information that a library signage can convey to its users.

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

Next in the series of chapters featured in the book is the chapter that focuses on "new tools, gadgets, and devices in the libraries"; summarizes, to some extent and expatiate to a large extent, the various new tools, devices and gadgets operational and adaptable to various aspects of librarianship and sections of the librarians. After an exploration of how these devices and tools work, and the different types, the author provided a comparison of current popular products, followed by a look at some of the new tools, gadgets and devices that we have available (to and around us). With the awareness that we are in the midst of an ongoing information revolution, the internet and personal computing are key components of this transition, and has tremendous potential to transform library services. In this chapter, all tools/devices and gadgets therefore, will be analyzed with an eye towards the future, cost-effectiveness, performance and functionality.

Part of the new drama users are witnessing in the libraries today is the issue of marker-space. In the light of this, the next chapter in this book looks at Markerspace: motivating, engaging spaces in libraries and information centres.

It has been pointed out that the emergence of Open Access initiative is one of the most significant changes to the world of scholarly publications since the migration from print to digital publishing began. Reports of some authors have demonstrated how libraries across the membership are changing, in response to a need for new services and an increasingly diverse client group. In order to contribute to the existing knowledge in the area of open access movement in libraries, this chapter discusses how the 21st century library provides a service that can provide open access to knowledge for the growth and development of communities they serve by highlighting the concept of open access and open content, roles of libraries in open access initiative as well as library collection development and open access. Against the background, the chapter sheds light on legal and ethical issues in open access and the future of open access in Libraries.

The use of social media is now trending is libraries as a number of studies have reported that it now facilitate effective delivery library services. In the light of this, the next chapter in this book discusses the use of social media as tools for information sharing among undergraduates of university of Ilorin. The chapter, therefore, explores the use of social media for sharing information among undergraduate students. The research design adopted was a descriptive survey. A pre-tested questionnaire was employed for data collection. Out of three hundred and fifteen (315) copies of the questionnaire administered to students of Faculty of Communication and Information Sciences students of the University of Ilorin, three hundred (300) was returned, however, two hundred and ninety (290) copies of the returned questionnaire was found useful for the study. The data obtained were analyzed using simple percentages and frequency counts. The findings of the study show that students make use of social media tools for chatting and exchanging information aside academic dealings. It also revealed that the majority of respondents 242 (83.4%) use social media for obtaining research information. In addition, the findings also revealed that majority of the respondents 283 (97.6%) use Facebook for posting and sharing information, and a considerable amount respondents (260 (89.7) also agreed that WhatsApp is used for sharing information and useful documents. The study concluded with recommendations on the need to educate students on the negative influence of social media and also to strike balance between chitchatting and academic activities.

The focus of the next chapter is looking beyond now in publishing: the print versus digital debate. What should be the focus, contents or platform? In the light of this, the chapter emphasises that due to digital revolution there have been lot of development in the publishing industry and this is also affect

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

access to and dissemination of information. The issue about print and digital debate is now common place. However, the question about what the focus should be whether the content or the platform is still yet to be answered. While some believe that digital revolution will continue giving room for digital publishing to thrive, others are saying that it is not the platform that matters but rather the contents which should made available to the users when needed. Based on this background, this chapter of the book discussed the historical background of digital publishing, digital publishing initiatives, advantages and disadvantages of digital publishing, challenges associated with digital publishing, the print and the digital debate, looking beyond now: in terms of what the future holds for publishing? The chapter concludes by indicating that annexing new and emerging technologies by authors, publishers and librarians to get the contents across to the various audiences should be the target. This is because the era we are going into 'the internet of thing' is an era whereby everything related to contents and information will be dictated by technologies.

The preceding chapter examines the utilization of smart phones for retrieving research information resources from libraries by undergraduates. The study covers awareness, utilization; benefits, effects and constraints that affect smart phones for retrieving research information resources by undergraduates. These concepts generally implied that awareness facilitates interest for use. It was concluded that smartphone were used by undergraduate students to retrieve research information resources and this had positive impact on research out of students will produce positive impact on academic performance of students. It was recommended among others that efforts should be made by the university to inculcate mobile teaching and learning curriculum in to the school syllabuses at the various levels, and library staff, lecturers and university staff generally should be sensitized and trained in the use of mobile devices for teaching and learning.

The next chapter examines the use of social media in libraries and impact on undergraduates. The chapter covers concepts of utilization of social media; benefits, impact and challenges that affect the use of social media and academic performance of undergraduate students. The concepts generally implied that social media is the use of technology as the best medium to explore wide area of knowledge to produce positive impact on academic performance of students. Social media usage is beneficial to academic performance of students. It was recommended among others that awareness programmes of use of social media platforms should be provided by the university and library to students, access to use of social media resources and services by librarians should be provided to students; educational forums that will facilitate group collaboration and discussion on academic performance should be promoted in universities, connectivity to social media network sites and internet should be improved to facilitate instant information search by students.

The second to the last chapter emphasises the rapid advancement in technology in last two decades, mainly because of the advent of Internet, the world no longer works the same. The chapter explains that the advent of wireless networks and more recently mobile devices such as smart phones, tablets etc following the internet, contributed a lot their applicability in library's operations. As contained in extant literature, mobile devices have become a very important part of communication not only for telephone service users but also for the internet users. The two main reasons behind success of mobile technology is the benefits such as mobility and ubiquity served by mobile devices. It is on that that the chapter explores the application of mobile technology on service delivery in libraries, the advantages and disadvantages, also highlighted were the skills required by the librarians in incorporating mobile technologies to library services.

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

So far so good, the last chapter of the book features discussion on the relevance of web 2.0 for library services in digital era. It emphasises that Web 2.0 tools play crucial role in effective service delivery of librarians. The chapter covers awareness, utilization; benefits and challenges that affect the use of web 2.0 by librarians for effective service delivery. The concepts generally implied that Web 2.0 can be used by librarians as information acquisition tools that are used to gather information from sources outside libraries (for example, blogs and wikis), information dissemination tools that are used to distribute content and information to patrons (such as RSS feeds), information organization tools that facilitate storage and subsequent retrieval of information (social bookmarking and tagging), and information sharing tools that facilitate the bilateral flow of information between libraries and patrons (social networking and media sharing sites. The chapter concluded that web 2.0 tools play crucial role in effective service delivery of librarians. Therefore, librarians should be proactive in the adoption and use of upgrade of web 4.0 which is more current than web 2.0 to become relevant in the digital era.

Adeyinka Tella
University of Ilorin, Nigeria

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

Chapter 1
The Use of Social Media by Medical Librarians for Inclusive Engagement in the Management of HIV/AIDS in Nigeria University Teaching Hospitals

Wilson Chukwunedum Ochonogor
University of KwaZulu-Natal, South Africa

Stephen Mutula
University of KwaZulu-Natal, South Africa

ABSTRACT

Information and communication technologies (ICTs) have over the years evolved and synthesized to leverage a wide variety of tasks in all fields of human endeavor including library services. This rapid transformation has not only affected information handling procedures but has equally reshaped approach to the work environment in that librarians attached to medical libraries is required to acquire some knowledge of medicine in order to adequately and efficiently make informed decisions that can positively impact on the general medical practice and specifically the management of HIV/AIDS. The use of ICTs such as social media (SM) has further made the work environment a community pivot, a rallying point, rather than the solitary tedium that has retarded learning, communication, advancement, cooperation, and community support in the past.

BACKGROUND

The internet has greatly influenced SM penetration into all aspects of library services especially in the medical library where community of users (CoUs) can converge, confer and proffer simplified work output, better doctor-patient relationship and effective treatment. Hence, for effective implementation of SM in Nigeria university teaching hospitals, there is the need for the following to be put into consid-

DOI: 10.4018/978-1-5225-9034-7.ch001

Copyright © 2020, IGI Global. Copying or distributing in print or electronic forms without written permission of IGI Global is prohibited.

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

eration: formulation of online groups; schedule of regular updating of the site and contact information; simplification of keywords for easy content search and profiling; need to always inform members of current items, creating novel ideas as cleverly and satisfying as possible, need to widen out or reach others with novelties, advancement, activities, current drugs for specific ailments, and resistive drugs.

INTRODUCTION

The success of every establishment depend largely on the availability of information at its disposal. University teaching hospitals are charged with the responsibility of providing useful information to its community and for caring for their patients. They depend on the services of the library to be able to meet with this demand. The library itself in modern times largely depends on information and communication technologies (ICTs) in order to satisfy the information needs of both medical staff, students, and the community. ICT has evolved, diversified, and synthesized to leverage a wide variety of tasks in the medical field as such, the fastest means of communication that can get to the intended public mostly would be sought after. Access to current and useful information is an integral part of national development, whilst ICT such as SM plays a vital role in leveraging university teaching hospital objectives in ensuring that adequate and swift response to healthcare service delivery is practiced (Ochonogor & Okite-Amughoro 2018). To achieve this objective, both the medical practitioners, librarians, students, patients, and the stakeholders must be inclusively engaged and ensure a shared and satisfactory obligations.

The use of SM has however made the work environment a community pivot, or a rallying point, rather than the solitary tedium that has retarded learning, communication, health service delivery and advancement, cooperation or collaboration, and community support in the past. The term social media is broad and constantly evolving (Ventola, 2014) and generally referred to as internet-based tools that allow individuals and communities to gather and communicate; to share information, ideas, personal messages, images and other contents; and, in some cases, to collaborate with other users in real time; (Chauhan, & Coffin, 2012; ASHP, 2012; Duke, Anstey, Carter, Gosse, Hutchens & Marsh, 2017; Lambert, Barry, & Stokes 2012; Von Muhlen & Ohno-Machado, 2012; Ventola 2014) to sustain and ensure inclusivity within the health system. Such prevalent usage of SM has triggered the growing need for a corresponding and enhanced awareness of the field upon which groups forming a social network should be based. Hence, sustaining the group by soliciting information from all its members especially those who are vast in topics of discussion.

As SM use in the field of medical profession gains more ground, it provides tools for the sharing of health information, to debate healthcare policy and practice issues, to promote good health behaviors, to engage with the public, and to educate and interact with patients, caregivers, students, and colleagues (Ventola, 2014) including librarians who source, locate, preserve, and share the required information; and stakeholders responsible for the policy formulation and day-to-day administrative care of man and material items of the teaching hospital. Hence, for a modern UTH librarian or generally, clinical medical librarian (CML) to perform their duty of information provision for the community of medical profession, they require at least some degree of medical training. According to Taggart, Grewe, Conserve, Gliwa, & Isler, (2015) SM, including mobile technologies and social networking sites, are being used increasingly as part of human immunodeficiency virus (HIV) prevention and treatment efforts. They further asserted that SM is an important avenue for communication about HIV, likewise its use may continue to increase and become more widespread. This increase can only arise when librarians attached to teaching hospitals

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

or any other medical library circulate adequate information concerning the use of SM as a tool for HIV/AIDS management and prevention.

According to Hu, Farnham & Monroy-Hernández (2013) SM systems promised powerful opportunities for people to connect to timely, and relevant information at the hyper local level. They also said it has become one of the few sources of local news and life-saving information where traditional media is sometimes censored by governments or even criminal organizations. Social networking media (SNM) affords all the users freedom of expression that no government of criminal organization can censor, and it generates huge information content streams, which leverage, both academia, health profession, developers efforts in providing unbiased, powerful indications of users' opinion and interests (Vakali, Giatsoglou & Antaris (2012). It generally becomes imperative for the health profession under the oversight of seasoned and medical certified librarian to adopt and use SM for their effective medical health service delivery and be able to manage the wide spread of HIV/AIDS.

As the library has the responsibility for the provision of information, to organize and disseminate such information, it becomes interesting for them – librarians to ensure proper search for social media groups (SMGs) that will be of benefit to the medical profession for clinical excellence. Achieving this requires that the librarians become conversant with the profession by acquiring a certificate to position them on how to connect clinicians to various SMGs using their profiles to organize such groups as was done in periodical routine. When the librarian sought and provides the needed information through his online search for groups that the clinicians may form strong tie, they may readily accept to use SM even when they initially would have objected. Bearing in mind that the medical field is time staking, the librarian should work towards saving the time of the health professionals so that they can attend to their duty of saving lives. This unsolicited information delivery will motivate medical practitioners to have a rethink towards SM use in fostering their life saving job. Once they become motivated, they will naturally yearn for more of such services. This is especially important as HIV/AIDS causes stigmatization, depression and shame leading to most affected people in Nigeria not being interested in revealing their status or going for the test all together.

In this chapter, we will look at:

1. The meaning of social media
2. Social media sites
3. What is inclusive engagement?
4. The role of librarian in a medical library
5. Using social media to manage HIV/AIDS
6. Doctors, librarians, students and stakeholders' inclusivity

MEANING OF SOCIAL MEDIA

Having alluded to the varied definitions given by scholars on social media, it would be important to note the several forms of social media. SM are web-based tools that are used for computer-mediated communication and in health care, they have been used to maintain or improve peer-to-peer and clinician-to-patient communication, provide institutional branding, and improve the speed of interaction between and across different healthcare stakeholders (Grajales, Sheps, Ho, Novak-Lauscher & Eysenbach, 2014). SM is internet-based media interface, designed to connect people to each other irrespective of location and

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

facilitate intellectual interaction with user-generated content (Brasg, 2013), for advancement and effective contributions to health care service provision and especially management of HIV/AIDS among members of the same group. SM can be defined to include YouTube, Twitter, and Facebook (Nair, 2011) for the sole aim of communicating amongst a group of people with common objective. Social media technologies (SMTs) have many different forms including blogs, business networks, enterprise social networks, forums, microblogs, photo sharing, products/services review, social bookmarking, social gaming, social networks, video sharing, and virtual worlds (Aichner & Jacob, 2015). The versatility, portability and usefulness of SM in modern workplace permeates compactly with library profession especially those attached to health institutions. With SM, librarians will be able to adequately offer specialized services to the medical library audience (MLA), chiefly the medical professionals and students as they are bound to interact with a wide and varied community of group members, filtering the results of their conversation and making informed recommendations on sources and materials to be consulted by these users to enable them render better and efficient services.

SM refers to software that enables individuals and communities to gather, communicate, share, and in some cases collaborate or play, typically in the context of applications accessible through internet browsers or mobile devices (von Muhlen & Ohno-Machado, 2012). They inferred that it has broadly affected medicine publicly by increasing communication with and among patients who are connected in one social network. Social network applications (e.g., Facebook, Twitter, Foursquare) have gone viral and are dominating the internet today, and they are uniting with conventional applications, such as multimedia streaming, to produce new social media applications, e.g., YouTube-like sites (Wu, Wu, Li, Zhang, Li, & Lau, 2012). It is expected that the future of SM will continue to adopt other versatile technologies for functionalities like streaming to perfect proactive information service and technology demand especially in the field of medicine and particularly for the management of HIV/AIDS and other dreaded diseases.

SM builds on the ideological and technological foundations of the web 2.0 and that allow the creation and exchange of user-generated content (Van Dijck & Poell, 2013). They bolstered this point by inferring that over the past decade, SM platforms have penetrated deeply into the mechanics of everyday life, affecting people's information interactions, as well as institutional structures and professional routines. As such SM can be said to have reshaped the normative face-to-face interaction between family members, friends, workmates, schoolmates and the world in general. Generally, SM has the potentials to transcend its intended membership as each participating members might share the output of their group discussions with others who are none members of the group while the generating source remains normal, unless otherwise negatively affected. The pervasive SMT provides prodigious momentum for a more disruptive mode of information-sharing and relationship building practice and within the space of, a large portion of previously passive information consumers has been transformed into powerful creators, transmitters, and discussants of information (Lee. Oh & Kim, 2013). Hence SM can be said to have broken the ethics of once exclusive reserve of most organizations as debate for a more proactive opinions are solicited from members of an organization before decisions are taken.

The entrant of SMTs in the medical profession must be capitalized on by medical professionals to unprecedentedly accelerate medical public awareness (MPA) especially in relation to management and preventing of the spread of HIV within Nigeria. SMTs are global information infrastructure (GII), where individuals, such as medical doctors and librarians bring their social relations online and share information, photos, videos, songs, as well as ideas (Magno, Comarela, Saez-Trumper Cha, & Almeida, 2012), and these helps to create awareness if properly deployed by medical physicians and MLs in Nigeria. It is clear from all indication that the use of SMN either in the medical field for health care service delivery,

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

or in the library for the dissemination of information within Nigeria is much needed as records shows the effect of HIV/AIDS in Nigeria.

SMTs harnesses the collective knowledge, ignorance, biases, and insights of the active participants (Nair, 2011) thus, informing, awakening a need for an answer, critic others contributions, and or drawing conclusions on generated issues among members of a group. This makes SM use more interesting as important life questions can be anonymously asked, answers sought, thereby making informed decision. SM is much like a continuous learning process whereby new information is constantly created as such Prensky, 2003; Anderson, 2004) postulates that, in SM generally, we socialize and learn:

- Behavior through imitation, feedback, and practice;
- Creativity through playing and socializing;
- Facts through association, drill, memory, and questions;
- Judgement through reviewing cases, asking questions, making choices, and receiving feedback and coaching;
- Language through imitation, practice, and immersion;
- Observation through viewing examples and receiving feedback;
- Procedures through imitation and practice;
- Processes through system analysis, deconstruction, and practice;
- Systems through discovering principles and undertaking graduate tasks;
- Reasoning through puzzles, problems, and examples;
- Skills (physical or mental) through imitation, feedback, continuous practice, and increasing challenge;
- Speeches or performance roles through memorization, practice, and coaching;
- Theories through logic, explanation, and questionings.

It has been observed in recent times that SM creates a great influence on how the work environment functions. As such it becomes critical to measure the influence of social media in areas where it has been applied. Gu & Ye, (2014) averred that with the growing influence of social media, firms increasingly take an active role in interacting with their audience (Gu & Ye, 2014). According to Kami (2013), social media measurement can be as fairly simple or highly complex depending on one's organizational goals or objective.

Social Media Sites

The advent of SM has caused almost every profession around the globe to appraise the features of several networks to adopt and use those that are best suited for their profession. This has adversely affected the number of SMNS with many ascribed to various fields of study and discipline. The following are some of the SMNSs they include both general and specialized sites:

- **Twitter**: This is an online social networking service that enables users to send and receive 140-character messages or tweet (Attai, Cowher, Al-Hamadani, Schoger, Staley, & Landercasper, 2015). It is a space for the informal sharing of health information and advice and may also provide a venue to identify potential dangers, promote positive behavior change and disseminate valid information (Scanfeld, Scanfeld, & Larson, 2010) to facilitate management of HIV/AIDS.

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

- **Instagram**: Instagram is a social media site that is associated with mobile applications such as iOS and Android. It prompts users to turn their mobile photographs into visually alluring pictures, and these are shared within members of the same network or group. These images can be made public in other social networks, such as Twitter, Facebook, Tumblr, Flickr, and Foursquare. The advent of smartphones with unprecedented high and clear image quality, led to the grand adoption of Instagram where pictures including comments can be posted online. Images posted on the Instagram projects better quality than other social media network/site (SMN/S), hence, its use in the field of medicine can lend credence to better medical images and effective health care service delivery.
- **Pinterest**: This is a photo-only microblogging site where users define themed boards for posting content (e.g., food, art, marine fish including HIV/AIDS images) which can equally be shared via Facebook and Twitter (Bik & Goldstein, 2013). The images are like adverts but can contain warning signs as well, so when used for HIV/AIDS images, group members or the general public after accessing them would be able to know some of the signs or symptoms of the disease. This affords the physician an anonymous posting and patients and the general public benefits from such posts after viewing them.
- **Tumblr**: Tumblr is a microblogging site that can publish any type of media very easily and quickly, such media includes: photos, videos, or short quotes as posted to long written narratives (Bik & Goldstein, 2013). Physicians can take advantage of this kind of site to reach as many persons as possible whenever he makes a post. The librarian can equally ascribe reference on how to reach a physician charged with the management of HIV/AIDS within an hospital or contact information of such physicians.
- **Blackboard VLE**: The blackboard VLE is a learning centered interface or application which allows for mapping of schedules, tracking of activities and achievement, online learning support, online tutor support, peer group support, general communications – through several media, and a connection to other networks both internally and externally. Blackboard facilitating features according to Heaton-Shretha, Gipps, Edirisingha & Linsey, (2007) includes: An 'announcements' area: a type of noticeboard, where message might be uploaded by staff (physicians) ; documents and files area, to which files in a wide variety of formats (word, PowerPoint, Excel, or video and audio creation software) might be uploaded by staff; communication tools: - each department in Blackboard can be allocated its own discussion board, virtual classroom (virtual theatre) or chatroom, and email function; a digital drop-box through which students (patients) might submit assignments (health information query) to physicians electronically; assessment facilities, through which staff (physicians) might create quizzes (health information needs) and tests (health reports) for summative or formative (health requirement) purposes; group features: distinct 'group areas' can be created for groups of students (such as, HIV/AIDS infected persons and those not infected) on a Blackboard module – notice (e.g., students working on a common project – management and or prevention), each with its own discussion board, online file exchange and email function.
- **Facebook**: This is a social media network that is widely used among social network users. it is very popular especially among students and is divided into two opinions: (1) create public profile that may reach a different audience than Twitter or blogs; or (2) they eschew using Facebook for research-related purposes at all, perhaps maintaining private profile for only their closest friends and family (no one should get offended if people do not accept their friend request) (Bik & Goldstein, 2013). Facebook allows users to accept or add friends, send message, and update

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

personal profiles in order to notify friends and peers about themselves, personal activities, current medical procedure, prevention counsel on diseases like HIV/AIDS, HIV/AIDS secure information profiles (Quan-Haase, & Young, 2010). Again, they said, users can also join or form virtual groups, develop applications, host content, and learn about each other's interests, hobbies, and relationship statuses through users' online profiles. In fact, Facebook can help users' widen their range of friendship as they form peer-to-peer, special group, and general group. This implies that while the medical doctors form their medical group, medical librarians also form theirs, HIV/AIDS carriers also form their groups, but does not relinquish members of all these various groups forming a general yet specific group on HIV/AIDS in order to be able to effectively manage the spread and if possible, prevent it altogether.

- **WhatsApp**: This is a cost effective messaging application that allows a user to send and receive messages called chats over internet data plan that is used for emails and web browsing. WhatsApp messenger is applicable with several phone mobile devices such as iPhones, Nokia, Blackberry, Android, and most smart phones that are available in the market today (Mbanaso, Dandaura, Ezeh, & Iwuckukwu, 2015). The WhatsApp application allows only the sender and the receiver of any of the sent content such as: photos, videos, messages, files, or any kind of message will be able to access such chats. Since health especially HIV/AIDS related issue and records are always treated with outmost confidentiality, this use of WhatsApp for medical update and HIV management through this medium becomes considerably an issue of significance.
- **LinkedIn**: This is an SMN that is professionally inclined and emboldens users to build abridged CV in order to institute 'connections'. It makes strict use of individuals' profiles and eliminates other personal details such as favorite music, favorite movies, books, political affiliations, religious affiliations, hobbies, and others. Much like other SM, LinkedIn friendship or membership can be solicited or recommended as stale members notifies others about a members recent achievements in the field. It is increasing its popularity and has become the most used SMN platform for professional activities, even exceeding the popularity of Facebook. While medical librarians can use the LinkedIn to solicit information from other medical librarians across the globe on how to better serve physicians with their information needs, physicians can equally use LinkedIn to get professional information from colleagues who live in a distant location on how to manage HIV/AIDS pandemic. Hence, HIV/AIDS patients can benefit twofold: from the physician and the medical librarian. While the physician handles treatment and advice, the librarian provides the necessary information for the patients' consultation.
- **Flickr**: Flickr is a photo sharing website that aims to provide new ways of organizing photos and other images (Rafferty, & Hidderley, 2007). Flickr adopts author-based indexing but can be done collaboratively if the author allows his family members, friends, and other contacts permission to organize photos – not just to add comments, but also notes and tags (Rafferty, & Hidderley, 2007). It does not only share photos, it also shares videos which can be retrieved in many formats just as photos and videos can be uploaded from a variety of appliances such as mobile devices, the web, and personal computers; and is easy to access from a variety of software as well. This makes its usefulness valid as it will allow physicians to upload photos and videos to educate their patients on how to individually manage HIV/AIDS. On the part of the librarian assisting the physicians becomes even simpler as they can organize site where relevant HIV/AIDS related photos and videos can be found online and forward same to the physician to enable them attend to patients needs

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

on time and with adequate and vivid illustrations on what the patients should do and at what time they should do such things.

- **Google+**: this is an SMN created by google and announced as a new generation of social network and included several new features, such as circles that allow users to share different content with different people and hangouts that lets users to create video chatting session and invite up to nine people from their circle of friends to share the environment (Magno, Comarela, Saez-Trumper Cha, & Almeidda, 2012). They also said since its launch, google+ has been adding new users rapidly as the mere registration of a Gmail account automatically registers such individual google+ account. The good thing about this is that rather than asking An HIV/AIDS patient for registration in order to get updates on new treatments or change of drugs, the mere registration of the patient in the electronic registry of the hospital qualifies such an individual if he or she has a Gmail account. This also helps the librarian to be able to tract and forward relevant health tips on healthy life style that will help HIV carriers remain in stable condition for a long time.
- **YouTube**: This a social media site created in 2005 with the aim of allowing users' to share video, and interact. It can serve the purpose of providing health information for the general public on issues relating to HIV/AIDS drugs, prevention, and other counselling. This network or site facilitates easy access of information that are posted by physicians charged with the responsibility of handling HIV/AIDS cases. Since YouTube has long been in use by many, and it provides an accessible and popular medium for librarians to deliver point of contact and supplementary information and library instruction (Monge, 2007) and also facilitates patients accessibility for their HIV/AIDS counselling, while the physicians can constantly generate or create new videos for their willing patients to access. One very good thing about YouTube is that it does not require any registration, just click and the video or audio is right there on the screen for your viewing or listening. Hence, so, users are not always faced with the challenge of being identified as the sickness in most countries or communities comes with stigmatization.
- **Azure**: This is an enterprise integration solution designed by Microsoft, it combines both computing infrastructure and a platform for developing applications. Although Azure is not a social medial, it is a facilitator as it allows streaming both upstreaming and down-streaming otherwise known as decoupling in real-time. For those who would love to stream or download or upload any content, this application becomes useful.
- **Vlogs**: Vlogs are a form of online publishing, it allows everyone with web access and simple video production tools – such as a computer and a webcam or cell phone with video capabilities – to create and post content (Molyneaux, O'Donnell, Gibson & Singer, 2008). They are generated by individual user members and posted online to solicit comments from members of the group.
- **Wikis**: Wikis used in medical and health care information (MHCI) facilitate information circulation among professionals as it help create and share new knowledge and dialogue collaboratively in virtual terms. It also enable learners engage with others in the same group. Wikis help medical doctors in local or remote locations to collaborate with friends in other parts of the world to share experiences on how they coped with particular disease pandemic. Although wikis has good features, it is prone to hacking and health being a sensitive issue, this makes the use of wikis risky in the health environment.
- **Podcasts**: This is a social networking site that allows the creation of audio and video contents for an audience that would want to listen or view the content when they want, where they want, and how they want ((Buolos, Maramba & Wheeler, 2006) choosing the form that they prefer. They

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

also stated the current educational podcasting applications for medical use to include: recording of lectures for those students unable to attend the lecture in person – this is also applicable to the theatre environment where surgical activities are recorded for future references and display of novelty; audio recordings of textbook content by chapter allowing students to read or view text while walking or driving to class; and downloadable libraries of high resolution heart and respiratory sounds for medical students. Podcast uses really simple syndicate (RSS) which is embedded in Windows Internet Explorer 7. As such, users do not have to depend on devoted "podcatcher-programme" in order to access and download items.

- **Blogs**: Blog is a web site of engages people in knowledge sharing, reflection, and debates, so it often attracts a large and dedicated readership; with main features which include easy posting, archives of previous posts, and standalone Web page for each post to the blog with a unique URL (Buolos, Maramba & Wheeler, 2006). In this way, a clinician can post a photo taken with his digital camera, and make comment on the post for debate.
- **Mashups**: This is a web site that combines information and services from multiple sources on the web; it can be grouped into seven categories, namely: mapping, search, mobile, messaging, sports, shopping, and movies and serves to enhance user interface, value-added information by aggregation and value-added information augmented with and enhanced user interface (Murugesan, 2007).
- **Sermo**: This site is regarded as "virtual doctors' lounge", it's one of the most popular medical site around the globe. Doctors can interact with their peers on issue concerning their patients anonymously and their peers can relate experiences similar to such issue and using discernment to provide care and advice to the patient.
- **Doximity**: This site is United State of America (USA) biased as members are mainly based in the US. Here, journal article are available for members to consult and prepare for their certificate examinations.
- **Orthomind**: This social media site is mainly for orthopedic surgeons and is accessible on smart phones, IPad, and laptops.
- **QuantiaMD**: This site is designed for education and teamwork among medical doctors. If physicians become members and carry their students along, it will lessen the financial burden of materials acquisition in the library.
- **WeMedUp**: This site projects latest medical advancements, generates access to job openings, and keeping abreast with new treatments for diseases. This site enables healthcare service providers to share and compare images like X-ray around the world and can be better use by doctors in isolated areas to function adequately. This sharing of such images and followed by diagnosis and prescription by other doctors equip medical doctors in distant locations the new idea on how some sicknesses are presently treated.
- **Digital Healthcare**: This google+ site is a general site as it welcome both doctor, patients and stakeholders who are involved on healthcare debates.
- **Student Doctors Network**: This is a student support site aimed at helping student attain their goal of becoming a professional. It prepares them by providing assistance needed during training from high or secondary or middle school years of study.
- **Healthcare and Medical Software**: It's a google+ site that provide specific software applications concerning medical profession.

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

- **DoctorsHangout**: This is a global site for both students and veteran doctors with different groups which allow members to make their choices on which of the groups to join and discuss with.
- **Medical Doctors Medicos Clinical Medicine**: A google+ site for international connections and assistance.
- **MomMD**: This site is gender bias and discusses issues bordering on salaries as women medical practitioners are affected.
- **Medical Doctor**: This google+ site deploys comic reliefs for the entertainment of medical memes as members use their favorite images to.
- **AllNurses**: This is a core professional site designed for advice on topical issues amongst peers.
- **Medical Apps**: This is a google+ site that targets students for assistance on their medical training.
- **NurseZone**: This site deals exclusively on matters bordering on nursing issues ranging from assistance given to newcomer nurse, those already in their carrier path, to seasoned nurses in other to learn a variety of current activities relating to nursing. They also discuss issues on choices of career available in the work of nursing.
- **Ozmosis**: This is a secure site that enable physicians to communicate amid professional groups for the purpose of information sharing devoid of advertisement.
- **Physician's Practice**: This is a LinkedIn professional group that facilitates physicians' day-to-day activities and simplifies discussion.
- **Medical Group Management Association (MGMA)**: This is another professional group from LinkedIn that facilitates skillful track record management practices among health care professionals around the globe for standardization of practice and patient healthcare delivery.
- **Mayo Clinic Social Media Network**: This social media network site (SMNS) is comprehensive, and resourceful for health care professionals as it allows forum discussion, blogging, hence, enabling a user to expand his professional skills.
- **Hootsuite**: this SM tool allows a user to manage several social media profiles at any given time and be able to track increase in followership.

It has become clear then that there are many SMN that is at the disposal of the medical doctors, however, the medical librarian (ML) should be of assistance to these clients to enable them make good choices. They should be aware of the various SMNs available for the profession, join the professionally recognized network; affiliate themselves with those that can facilitate learning, encourage patients to associate with groups that discusses HIV and so on. Through this means therefore, both the librarians, physicians/doctors, and patients can work together to reduce the spread of HIV/AIDS in Nigeria.

WHAT IS INCLUSIVE ENGAGEMENT?

The advent of the internet, chiefly social media, has reshaped the approach to healthcare service delivery and library services as it leverages their access to information. SM have generated tremendous prospects for librarians, students, healthcare professionals, stakeholders and a heterogeneous groups to promote effective communication on healthcare services delivery and wellness. Patients have also tapped from the many benefits of SM, as it leverages anonymous interaction with peers, physicians, librarians and educate others on the peril HIV/aids has caused globally.

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

The term social inclusion or inclusive engagement is understood as a process by which efforts are made to ensure equal opportunity for all regardless of their background, that is: age, pigmentation, educational background, social status, profession, or otherwise, so that they can achieve their full potentials in life. It is a multi-dimensional process aimed at creating conditions which enable full and active engagement or participation of every member of the society in all aspects of life including civic, social, economic, and political as well as participation in decision making process (Mancinelli, 2008), participating as a full member of society or group and the capacity to realize the conditions of social citizenship (Sinclair, Bramley, Dobbie & Gillespie, 2007). As such, it becomes obvious that social inclusion or engagement exists when people accept and care for each other from the heart regardless of their social class, occupation, sex, and race (Chan, Evans, Ng, Chiu & Huxley, 2014) or on what they stand to benefit from the friendship or group.

According to Moorhead, Hoving, & Sipsma (2015) SM platforms, including mobile technologies and SNSs, are being used increasingly as part of human immunodeficiency virus (HIV) prevention and treatment efforts. They also said that using SM to bridge communication among diverse range of users, in various geographic and social contexts, may be leveraged through pre-existing platforms and with attention to the roles of anonymity and confidentiality in the communication about HIV prevention and treatment. The interesting thing about SM is that any member of the society has equal right of becoming a member, unless otherwise restricted as in the case of medicine where physicians' membership would be screened before they may be allowed to register. In this kind of situation, it is expected that since such site is distinct in nature, only certified or recommended individuals would be granted membership, while the general or open sites can as well serve the general public and they will get as much needed information from such sites as physicians and librarians also are eligible in these networks. The traditional and conventional role of the librarian which is to make information and information materials available to its audience remains paramount especially given the urgency the treatment and prevention HIV demands.

While the medical doctors or physicians are responsible for the treatment and counselling of HIV patients, the librarians' responsibility remains that of providing the needed information in support of any form it may come to satisfy the physicians' information need and quell the information demands of the patients concerning HIV/AIDS treatment and prevention. Although stigma and cultural considerations forms a major prevention for people living with HIV/AIDS and at-risk population from accessing in-person HIV prevention and treatment initiative (Mahajan, Sayles, Patel, Remien, Ortiz Szekeres, & Coates, 2008; Taggart, Grewe, Conserve, Gliwa, & Isler, 2015; Moorhead, Hoving, & Sipsma, 2015; Turan, Cohen, Bukusi, Turan, Stringer, Onono, & Weiser 2014) SM can offer a neutral platform for engagement (Blackstock, Haughton, Garner, Horvath, Norwood, & Cunningham, 2015) in discussions that border on HIVAIDS treatment and prevention. For example, individuals can seek and share information about specific prevention strategies, engage in dialog about HIV research, and leverage support for issues such as medication adherence and emotional coping strategies for HIV research (Taggart, Grewe, Conserve, Gliwa, & Isler, 2015; Muessig, Nekkanti, Bauermeister, Bull, &Hightow-Weidman, 2015; Ko, Hsieh, Wang, Lee, Chen, Chung &Hsu, 2013; DeSouza, & Jyoti Dutta, 2008; Coursaris, & liu, 2009; and Strand, 2012), this is not an exclusive reserve of the physicians or librarians as all renders their separate obligations. According to Taggart, Grewe, Conserve, Gliwa, & Isler, (2015), the increased social support provided by SM has been shown to improve treatment adherence and access to HIV testing and prevention services (León, Cáceres, Fernández, Chausa, Martin, Codina, & Blanco, 2011; Hailey

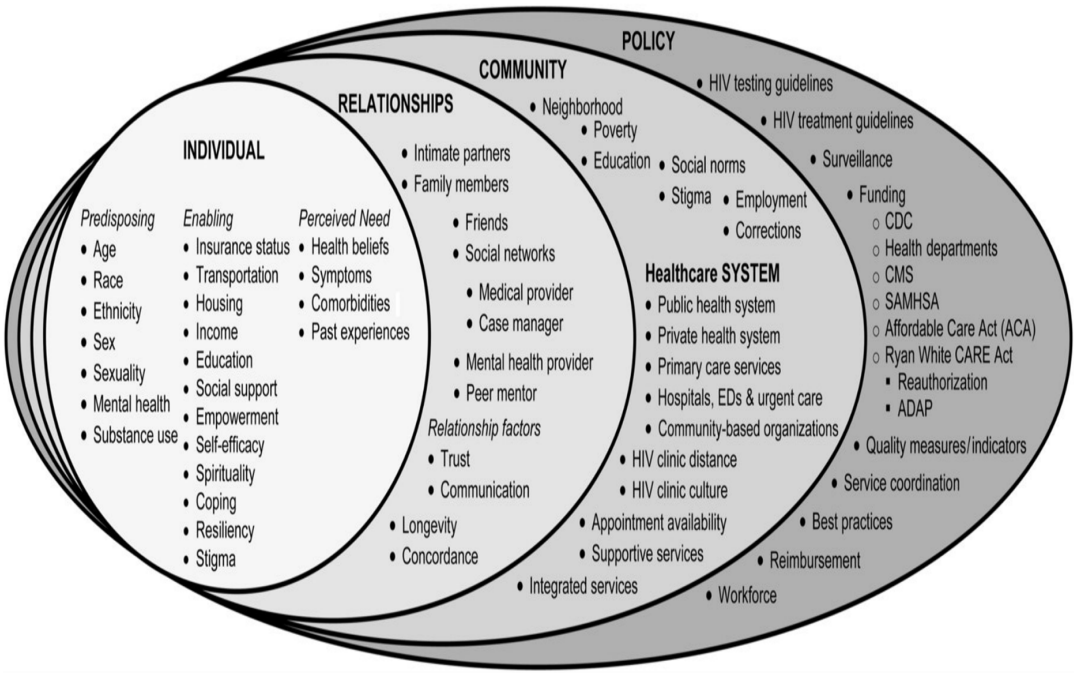
Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

& Arscott, 2013), and also grant HIV patients necessary support to deal with stigmatization associated with the disease as they independently search for information predominantly through SM. The pervasive use of SM has been of great benefit as it help the MLs provide HIV persons with adequate, timely, and relevant information on how to form groups with their peers (people living with HIV-PLHIV), gain emotional backing, and build ties with others suffering from the disease.

Figure 1 show a clear indication of the various categories of individuals that play major roles in inclusivity engagement in the management of HIV/AIDS. Not to be undermined is the significant role information and information providers contribute to satisfy the information needs of these individuals that are engaged for the purpose of providing the needed HIV/AIDS care to patients. Without information, no part of the circle would function because from individual, relationship, community, and policy; all depend on information, and this is the librarians' exclusive reserve as he chooses suitable SMNS for each group and further integrate all in a single network where anonymity facilitates individuals' activities among peers. While individuals are the various members of the group, the relationships simply mean those who are their friends within the group, community refers to the entire group or network, and the policy aspect of the figure is responsible for the rules guiding the entire network for sustainability. No part of the figure is less, as they collaboratively contribute to the general activities of the system.

As the use of SM has crept into all facets of human endeavor, it harmoniously facilitates the way information demand and handling structured. While SM simplifies the work of a librarian, it equally facilitates the physicians' research and leverages patients' mode of communicating with their doctors.

Figure 1. The state of engagement in HIV care in the United States: from cascade to continuum to control
(Source: Mugavero, Amico, Horn, & Thompson, 2013)



Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

THE ROLE OF LIBRARIAN IN A MEDICAL LIBRARY

According to Veenstra, (1992), the primary role of the clinical medical librarian (CML) is locating and providing quality-filtered, patient-specific information to physicians. As in the past, librarians participated in evidence-based medicine (EBM) which is rooted in past practices, most notably in clinical medical librarianship (Scherrer, &Dorsch, 1999). According to Scherrer, & Dorsch (1999), EBM is defined as the conscientious, explicit, and judicious use of current best evidence in making decisions about the care of individual patients. For a librarian to function, in this capacity, he must be able to search for literature, select what he considers appropriate at the time, and appraise such information by criticizing the source. Since clinicians have their special information needs, and by the librarians' professional training, he must be concise about the information that would be selected to serve health professionals better. Even though the librarians is not trained to go on ward rounds, he must interact with both clinicians and patients to elicit areas of information needed to facilitate his information search and provision. Scherrer & Dorsch (1999) stated that to provide information quickly to physicians and other members of the healthcare team; to influence the information seeking behavior of clinicians and improve their library skills (social media use skills – SMUS); and to establish the medical librarian's role as a valid member of the health care team.

According to Giuse (1997), it is CML responsibility to teach our constituents (physicians and patients) that accurate, up-to-date, quality filtered information provided by CML programs can have a measurable positive impact on the clinical environment. Giuse (1997) also said librarians should engage on rounds and share their findings in the same way the residents do: they should step in front of the group and present what they discovered through their research; by so doing fostering verbal, interactive, eye-to-eye with other members of the team as this is crucial for establishing the librarians credibility not only in terms of understanding the medical issues of the question asked, but also of demonstrating familiarity with and understanding of the information selected and filtered. When CML take up this responsibility, supporting themselves with SM, and certificate in medicine, they make a formidable input in the management of HIV/AIDS.

CML requires background knowledge of clinical activities to prepare for the cultural shift in their role of information provision, and positively discuss with any medical team. As part of their effort to assimilate the new culture, CMLs should seek instructions in the techniques of clinical trials, including randomization and blind techniques; they should study the tenets of evidence-based medicine; they should consult with subject experts and clinicians who can evaluate and support their filtering and interpretation skills; and they should take clinical courses in the medical and nursing schools [(possibly by auditing courses for free; otherwise by drawing on the library professional budget), Giuse, 1997]. This effort will adequately position them with the requisite knowledge that will facilitate their effective interaction with team members and understand clinical professional jargons. Much as this need is important, they do not want to lose sight of the fact that they must be lovers of gadgets for them to be able to effectively use SM in providing information for their clients.

SM has proved to be of crucial significance in harnessing the success of health care service delivery, especially in a debilitating situation such as that created by HIV/AIDS. For clarity on what should be forwarded to the medical professionals, Scherrer, & Dorsch, (1999) pointed out that clinical medical librarians be well-versed in medical terminologies to understand the conversations on round thoroughly. This knowledge will not only be useful in the print arena but will also be relevant searching for SMSs for the clinicians to belong. Once this is done, the librarian also sifts through conversations from such

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

SMSs and inform the clinicians on what is new especially novel areas that has to do with HIV both for the management and prevention.

USING SOCIAL MEDIA TO MANAGE HIV/AIDS

According to Campbell, Evans, Pumper, & Moreno (2016) research to date on social media and health has largely focused on the patients' experience. They engage in extensive information that most often leads to discussions as a group, using messages, chatrooms and other methods through the internet. They feel critical about the kind of information that will make them get well again and are ready to search and seek it from any available source. They further asserted that not much has been done on the physicians even though physician-generated health information is growing. They pointed out that a growing number of physicians are currently using SM as a professional platform for health communication. Giving the busy nature of medical doctors, it becomes a prerogative responsibility for CMLs to satisfy the information needs of their clients, the doctors, and medical students as well as PLWHA by searching for relevant information using their individual profiles to gather such information and circulate for choices to be made.

The menace brought by HIV/AIDS has been faced with great enthusiasm by doctors around the world, yet its ravaging effect still remains high and challenging as the cure evades science for the time being. Controlling its spread should rather be the focus rather than cure. Hence it has been observed that SM which includes mobile technologies and social networking sites are being used increasingly as part of human immunodeficiency virus (HIV) prevention and treatment (Taggart, Grewe, Conserve, Gliwa & Isler, 2015). This effort will bridge the information divide between those who currently are negative on issues surrounding HIV and adequately inform those whose status have been confirmed positive on how to manage themselves and save members of the public from contracting the deadly virus. Face-to-face discussion between physicians and PLWHA in Nigeria will be a milestone regarding HIV/AIDS as stigmatization is the order of the day. Rather, discussing in anonymous forum where many may create different identity to avoid stigmatization would be of great impact to preventing further spread of this killer disease.

SM according to Young (2012) can be used as an innovative method of HIV prevention. He enunciated that SM enables HIV prevention among at-risk population. This way both those who are currently afflicted with the virus and those that are negative in their status can benefit as information is constantly shared amongst group members. Young also averred that social networking site (SNS) for HIV prevention is an exciting area that combines HIV prevention/public health, engineering/technology, and business. In summary, Young (2012) gave the following guidelines on using social media networking for HIV prevention research which when incorporated into the field of medicine with the cooperation of the librarian can leverage SM in managing HIV/AIDS especially in Nigeria; these guidelines include:

1. Research collaborator experienced in using social networking technologies:

Necessity behooves a progressive and focused system to realize that the future depends on how well today is treated. In the medical profession, life of all must be saved and this calls for adequate and timely information to facilitate prevention of a well-known disease like HIV/AIDS from spreading more than it already has gone. So, at least one of the collaborators should be someone with requisite knowledge of

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

social media network and its technicalities, organization of information, dissemination of information, and observer and listener, and with vision for future as the network system may change with time.

2. Create a plan for addressing duplicate respondents:

The quality of data/information churned out from a single response to an online query is sometimes amazing and can be confusing if care is not taken. Sequel to this, it becomes critically important for source verification to avoid duplication, and impersonation. Such multiplicity if not checked, can be potentially dangerous hence the need for plans to address them as quickly as they surface. Since HIV is a dreaded disease, sources of data/information on prevention and management must be thoroughly criticized to ensure ingenuity. Young (2012) states: data quality can be improved through the traditional online approaches, as well as method unique to social networking such as Facebook Connect, an application that requests Facebook to verify a Facebook user's identity, can validate that each participant is unique. Facebook user background check on users 'network of friends can also be a great way to avoid duplication. Since health care service delivery is a necessary and sensitive part of human life, members of any social media on health maters should be willing to allow others verify their demographic details, by so doing, lowering the risks associated with misleading information.

3. A collaborator who understands the social networking business:

The penetration of SM in various aspects of human life over the years has helped to simplify the way humans enjoy entertainment, listen to news, study, conduct research, and work in any field of endeavor. In this regards however, healthcare is not left out for clinicians currently use it to garner data/information respecting various ailments such as HIV/AIDS. Health researchers must be conversant with policies governing any SNS they choose to join and abide by the norms as so that site owners may not discontinue their use for if their reputation is smeared or image is negatively represented. Young gave this example; that as HIV-related studies can be controversial, Facebook might decide to close an HIV prevention study in the middle if Facebook is negatively represented, so, understanding the business objective of the technology company, as well as gaining support from the business will help to ensure the study progress.

4. Address participants privacy and confidentiality issues:

In every aspect of medical practice, ethical issue must be observed and individual privacy and discretion must be respected and addressed. Young (2012) opined that

Awareness of the current privacy concerns associated with each technology will help alleviate participants concerns and maintain a confidential study environment. In some parts of the world especially in Nigeria, the stigma associated with HIV/AIDS is too strong and the carriers of this diseases are discriminated against rather than being assisted. Hence, individuals who are sufferers from this disease will be more engaged using SMNSs to their advantage as they interact with others who also have the same disease and with doctors whom for fear of exposure would not been possible on a face-to-face consultation. When the privacy and confidentiality of the sufferers of HIV and image of the social media site (SMS) are observed, the users of such sites experience great joy and would be able to render accelerated

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

information service delivery and effective health care services. All of which will help reposition health industry and instill confidence in the mind of all concerning their health records and privacy.

5. Internal review boards (IRBs) should include a researcher who is knowledgeable about mobile technologies.

One of the hard challenge medical field has faced in recent times is the management of HIV. Scientific and medical researchers have conducted several researches to discover the cure for this disease but the answer keep alluding humans. Hence it is necessary to look for ways to prevent the disease from further spreading. One of such ways is by getting timely information which can be obtained from the SMN not restricting any who is interested for asking questions or making lucid contributions for the benefit of all. Although it has been on notice that the use of technologies for sexually transmitted diseases are always delayed, focusing on its use at this point where there is no known cure for HIV becomes a universal responsibility and the library cannot shy away from adequately circulating information to curtail this disease spread. Since the use of technologies in the field of medicine are always delayed before deployment, the Internal Review Board, policy makers in the field of medicine must make provisions to persistently conduct research on how to deploy new technologies into clinical practice. Again, it has to be on record that every member of the IRB has the willingness to train and retrain members of the medical community to keep-up with the new trend and technologies like social media. This practice will have both short and long term benefit to the field of medicine by reducing the time lapse on technology deployment to clinical practice and further decrease the spread of HIV especially in Nigeria.

Taggart, Grewe, Converse, Giwa, & Isler, (2015) noted some benefits the use of SM for the management of HIV/AIDS can bring to include:

1. Access to information,
2. Enhanced ability to communicate (freedom of expression),
3. Having an anonymous identity,
4. A sense of social and emotional support,
5. Establishing a virtual community, and
6. Geographical reach.

Access to information is a vital ingredient for survival and most important to those who have a terminal disease like HIV/AIDS which in some cases can be controlled over a long period of time. With the availability of information at the disposal of PLWHA, they would be better informed on how best to sustain their lives after identifying his or her status. People generally are always introverted when it comes to issue related to HIV/AIDS as a result of the stigmatization HIV+ people receive from the community. This is a major reason why most people do not care about checking for their status from time to time, since once an individual is tested positive, he immediately wares a condemned status as well. However, PLWHA demonstrates appreciation for the ease and convenience of accessing information related to HIV care, treatment, management, and prevention through social media (Taggart, Grewe, Converse, Giwa, & Isler, 2015). For example, a single piece of information gained by one HIV person can be circulated among members of a chat group he or she belong which can further spread to non-members of the group depending on the network site the members belong.

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

Enhanced ability to communicate or freedom of expression comes into play when a HIV+ person has mustered up the boldness to anonymously express himself or herself emotionally and otherwise before the public or with his or her peers. With the use of SM, individuals can easily discuss about HIV person's sexual patterns/attitude and partners, physician or healthcare provider, healthiness/wellbeing, status testing, and or HIV prevention methods. All of these are possible especially as these individuals will not have to be physically present or be face–to-face with whomever they wish to discuss with without living their homes or offices; this includes adolescents who unfortunately would have inherited the disease from their parents, or have been involved in rape of any kind by PLWHA. This kind of information can be generated from the local library after the librarian has sifted relevant ones that are fit for members of group which the medical hospital generated for their clients and community.

Stigmatization, depression, social depravities, and other associated syndromes relating to HIV drives HIV positive persons (HPPs) into anonymity. HPPs are courageous to freely discuss, comment, or ask questions relating to HIV treatments, access to professionals, and prevention plans, as stigmatization and discrimination are leveraged by SM, since they anonymously engage is such acts without being identified. This is further made easy as some of the social media web sites (SMWSs) does not display the actual identity of members who prefer to be anonymous.

Engaging in an online community is a sense of social and emotional support or security for PLWHA since they are always stigmatized and discriminated against. Some who have tested positive to HIV have suffered abandonment by their family and friends creating a void, this situation is being bridged by their group members who either are positive or willing to help through SM discussions.

PLWHA due to stigmatization and discrimination, form virtual communities as a social network base to anonymously interact with others through specific social media, potentially crossing the geographical and political boundaries in order to pursue mutual interests or goals of which some are pervasive virtual communities and online communities operating under social networking services (Rheingold, 1993; & Burger-Helmchen, & Cohendet, 2011). This too can be an efficient way for PLWHA especially embolden themselves as they have been restricted from social life and activities.

PLWHA have been able to get to others outside of their circle of old friends to a larger community for several reasons such as anonymously: getting information related to HIV/AIDS – prevention and treatment efforts, consulting with physicians for counselling, and engaging in social activities, as they communicate with their peers in geographically dispersed arena. For these whole thing to be possible therefore, it means the medical librarian (ML) must be versatile with the various SMS and their membership status.

DOCTORS, LIBRARIANS, STUDENTS, AND STAKEHOLDERS INCLUSIVITY

It is very pertinent to note the value of quick access to information via SM and the extent to which its use can prove efficient for information management within the healthcare environment in Nigeria. In the past, physicians faced enormous challenge in handling HIV persons, for example, a majority of patients did not feel they were properly informed, educated, or given adequate explanation of what to expect throughout the course of their incurable sickness (Valdiserri, Tama & Ho, 1988), this situation after about thirty (30) years, still persist as they fear for the difficulty the patient may face getting his or her scenario/diagnosis. Hence, the advent of the SMN not only benefited the patients, but has also given

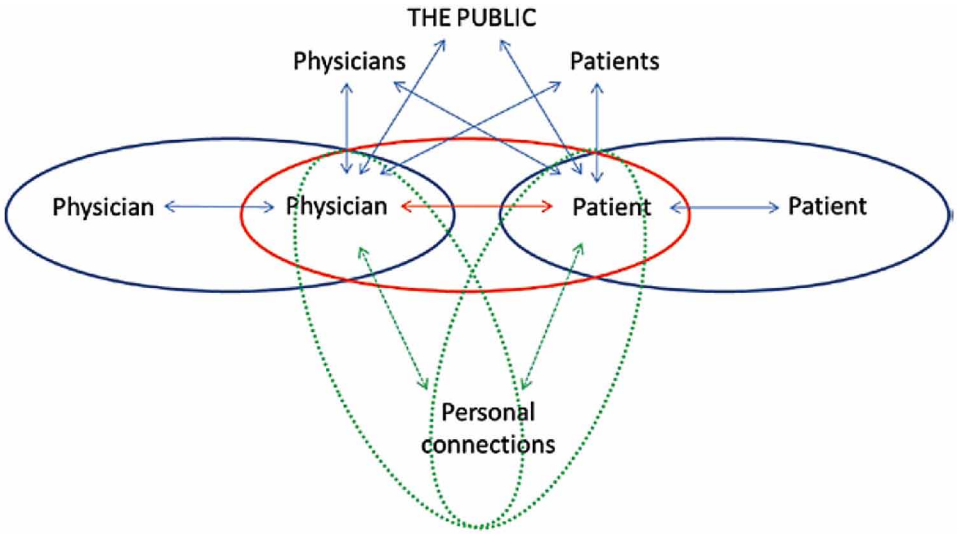
Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

the physicians an outlet to allow the patient find out some of the necessary information either through the help of a librarian or from SM.

While the medical doctors are responsible for the medical diagnosis, and health care service delivery, they depend on valid sources of information to be able to adequately dialogue and make informed decisions about their patients' health. In this regards, Nair (2011) points out four categories of healthcare on the internet today to include: dialogue, diagnosis, decisions and delivery (4D - for healthcare services on the internet). The 4D are critical to all as librarians, doctors, students, patients, and stakeholders interact before responding to any particular health condition. The librarian requires acceptable knowledge of what is going on around him so that when he makes search for materials to be acquired into the library for use, he will get the best available. Nair further stated that dialogue systems are proliferating as more and more customer (patients) want relevant and timely understanding of medical and health information both directly (from doctors) and from others who share their needs. On the issue of diagnosis, since patients require timely information, they are ready to search for information related to their diagnosed illness via the SM. Regarding this, Nair asserted that patients gain valuable treatment information and insight on social media platforms and online communities. This results when a patient post his diagnosed illness online and allow others to comment on possible treatments and or experience irrespective of the dangers associated with their actions.

In recent times, physicians have been observed using SM either for personal or professional purposes to find, interact, and share health information, communicate/network with colleague's and trainees, disseminate their research, market their practice, or engage in health advocacy (Chretien & Kind, 2013). They added that a growing minority of physicians use SM to directly interact with patients or in other ways that augment clinical care.

Figure 2. Key social media interactions among patients, physicians, (librarians), and the public. Solid line circles denote secure interactions. Dotted line circles denote personal networking interactions.
(Source: Chretien & Kind, 2013)



Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

The figure 1 above is a vivid representation of the life circle of a typical SMN. In a clinical setting, individual members of the network have their distinct ideas, experiences or health challenges and personal connections outside the network where some form of behind the scene interaction takes place. These are behind the scene activities and are diffused into the network for analysis and implementation. While the patients trying to understand the health challenge he or a member of his family is facing, the physicians are busy sourcing for solutions by making research and interacting with colleagues one network after another so as to provide and support HIV/AIDS care services delivery. At the same time, the much behind the scene information player - the CML is assembling adequate and timely information to equip the physicians' to be able attend to the health challenge; while the public critically watch and await the outcome.

Succinctly though, the CMLs role in the SM life circle even though invincible stands to facilitate the amount, form, and kind of information available for the physician to sift and come up with an efficient treatment that will be suitable for HIV/AIDS prevention. The public does not require a state of the art infrastructure but competence and confidence in the medical field before they can rely on it. Through social media tool, individual physician markets himself when his contributions in the group is always reliable and clearly understood by both colleagues and the public. This builds the patients confidence and trust as they likely will believe his answers to be more satisfactory. Even as this may seem hard to attain, all members of the group whether a physician, librarian, patient, or in the public group, need to cultivate quality of learning to listen before contributing to the group.

The patients use SM to find HIV/AIDS health information, support through discussion groups and forums, and chronicle their illness (Chretien, & Kind, 2013). The figure 2 shows that patients' discuses with one another and follow through with physicians as they become better equipped after they have searched and gathered view-points from other HIV/AIDS persons that have posted their experiences on the web. At this time, medical librarian (ML) become resourceful as they facilitate patients information needs that are consequently forwarded to the physician in preparation for professional interaction with the patient on later contact. This chain of process continues all through the period as long as the social media group (SMG) is functional.

The general public which often include all the stakeholders, continuously invest time and effort to ensure a more sustainable flow of information among group members. They gather interested individuals who have suffered some form of ailment such as HIV/AIDS to solicit information on how they have been able to cope with their situation in life so that they can use such experiences during their discussions with members of their group. It is expected that physicians and CMLs employ the services of psychologist to properly enlighten PLWHA on how best to sustain their lives and do not be discouraged about the stigmatization that may come with the ailment as this can be done through SMN.

CONCLUSION

Medical librarianship is a special aspect of librarianship that requires proper understanding of medical terminologies before venturing into it. In this era of SM, every unit of an organization need to have good knowledge of what is happening within the establishment to enable them make informed comment in the circle of friends or chat group within the network. This collaborative otherwise called inclusive engagement requires a corresponding obligation by the ML to be equipped with requisite certificate to function efficiently. There has been a growing need for the use of SM by medical doctors for the manage-

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

ment of diseases like HIV/AIDS within Nigeria. Nigeria has been adversely affected by the HIV/AIDS scourge as majority of the disease carriers do not have access to antiretroviral drugs for the control of the disease from blowing into a stage where it cannot be managed. Stigmatization has equally left most carriers whit shame as such would not openly go for test on time until the disease has become intensely rooted. Through SMN therefore, it is expected that Nigerians will become well equipped to battle with HIV/AIDS menace, as physicians, librarians, stakeholders and the general public with special focus on HIV persons' will create; circulate; discuss; support socially, emotionally and economically; all forms of information such as pictures, videos, and audio recordings for the purpose of managing this disease.

SM requires effective collaboration among group members. The field of medicine is

RECOMMENDATIONS

The use of social media by medical librarians for inclusive engagement in the management of HIV/AIDS in Nigeria university teaching hospitals, is expected to leverage HIV/AIDS management within Nigeria. Presently, observation shows that physicians argue among themselves and between medical departments about who and which department or unit in the hospital should attend to HIV/AIDS persons. As a result of this, some experienced physicians in the various university teaching hospitals are not given opportunity to PLWHA. This is dichotomous relationship need to be broken in order to realize the objective of provident good health for the public. The entire university teaching hospital should be internally connected and all university teaching hospitals in Nigeria be connected through social media so that they can form a community-based HIV/AIDS initiative and combat the dreaded disease as working as individuals will yield the needed result of preventing and eradicating the disease.

REFERENCES

Aichner, T., & Jacob, F. (2015). Measuring the degree of corporate social media use. *International Journal of Market Research*, *57*(2), 257–275. doi:10.2501/IJMR-2015-018

American Society of Health-System Pharmacists (ASHP). (2012). ASHP statement on use of social media by pharmacy professionals: developed through the ASHP pharmacy student forum and the ASHP section of pharmacy informatics and technology and approved by the ASHP Board of Directors on April 13, 2012, and by the ASHP House of Delegates on June 10, 2012. *American Journal of Health-System Pharmacy, 69*(23), 2095.

Anderson, T. (2004). Towards a theory of online learning. *Theory and Practice of Online Learning, 2*, 109-119.

Attai, D. J., Cowher, M. S., Al-Hamadani, M., Schoger, J. M., Staley, A. C., & Landercasper, J. (2015). Twitter social media is an effective tool for breast cancer patient education and support: Patient-reported outcomes by survey. *Journal of Medical Internet Research*, *17*(7), e188. doi:10.2196/jmir.4721 PMID:26228234

Bik, H. M., & Goldstein, M. C. (2013). An introduction to social media for scientists. *PLoS Biology*, *11*(4), e1001535. doi:10.1371/journal.pbio.1001535 PMID:23630451

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

Brasg, I. (2013). *CFMS guide to medical professionalism: recommendations for social media*. Ottawa: Canadian Federation of Medical Students.

Campbell, L., Moreno, M. A., Pumper, M., & Evans, Y. (2016). Social media use by physicians: A qualitative study of the new frontier of medicine. *BMC Medical Informatics and Decision Making*, *16*(1), 91. doi:10.118612911-016-0327-y PMID:27418201

Chan, K., Evans, S., Ng, Y. L., Chiu, M. Y. L., & Huxley, P. J. (2014). A concept mapping study on social inclusion in Hong Kong. *Social Indicators Research*, *119*(1), 121–137. doi:10.100711205-013-0498-1

Chauhan, B., & Janis Coffin, D.O. (2012). Social media and you: what every physician needs to know. *The Journal of Medical Practice Management: MPM, 28*(3), 206.

Chretien, K. C., & Kind, T. (2013). Social Media and Clinical Care. *Circulation*, *127*(13), 1413–1421. doi:10.1161/CIRCULATIONAHA.112.128017 PMID:23547180

Coursaris, C. K., & Liu, M. (2009). An analysis of social support exchanges in online HIV/AIDS self-help groups. *Computers in Human Behavior*, *25*(4), 911–918. doi:10.1016/j.chb.2009.03.006

DeSouza, R., & Jyoti Dutta, M. (2008). Global and local networking for HIV/AIDS prevention: The case of the Saathii E-forum. *Journal of Health Communication*, *13*(4), 326–344. doi:10.1080/10810730802063363 PMID:18569364

Duke, V. J., Anstey, A., Carter, S., Gosse, N., Hutchens, K. M., & Marsh, J. A. (2017). Social media in nurse education: Utilization and E-professionalism. *Nurse Education Today*, *57*, 8–13. doi:10.1016/j.nedt.2017.06.009 PMID:28683342

Giuse, N. B. (1997). Advancing the practice of clinical medical librarianship. *Bulletin of the Medical Library Association*, *85*(4), 437. PMID:9431437

Grajales, F. J. III, Sheps, S., Ho, K., Novak-Lauscher, H., & Eysenbach, G. (2014). Social Media: A of Applications in Medicine and Health Care. *Journal of Medical Internet Research*, *16*(2). PMID:24518354

Gu, B., & Ye, Q. (2014). First step in social media: Measuring the influence of online management responses on customer satisfaction. *Production and Operations Management*, *23*(4), 570–582. doi:10.1111/poms.12043

Hailey, J. H., & Arscott, J. (2013). Using technology to effectively engage adolescents and young adults into care: STAR TRACK Adherence Program. *The Journal of the Association of Nurses in AIDS Care*, *24*(6), 582–586. doi:10.1016/j.jana.2013.03.001 PMID:23809658

Heaton-Shrestha, C., Gipps, C., Edirisingha, P., & Linsey, T. (2007). Learning and e-learning in HE: The relationship between student learning style and VLE use. *Research Papers in Education*, *22*(4), 443–464. doi:10.1080/02671520701651797

Hu, Y., Farnham, S. D., & Monroy-Hernández, A. (2013, April). Whoo. ly: facilitating information seeking for hyperlocal communities using social media. In *Proceedings of the SIGCHI Conference on Human Factors in Computing Systems* (pp. 3481-3490). ACM. 10.1145/2470654.2466478

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

Johnson, H. A. (2017). Trello. *Journal of the Medical Library Association: JMLA*, *105*(2), 209. doi:10.5195/jmla.2017.49

Kami Huyse, A. P. R. (2013). *Social Media Measurement: A Step-by-Step Approach*. Academic Press.

Ko, N. Y., Hsieh, C. H., Wang, M. C., Lee, C., Chen, C. L., Chung, A. C., & Hsu, S. T. (2013). Effects of Internet popular opinion leaders (iPOL) among Internet-using men who have sex with men. *Journal of Medical Internet Research*, *15*(2), e40. doi:10.2196/jmir.2264 PMID:23439583

Lambert, K. M., Barry, P., & Stokes, G. (2012). Risk management and legal issues with the use of social media in the healthcare setting. *Journal of Healthcare Risk Management*, *31*(4), 41–47. doi:10.1002/jhrm.20103 PMID:22528403

Lee, K., Oh, W. Y., & Kim, N. (2013). Social media for socially responsible firms: Analysis of Fortune 500's Twitter profiles and their CSR/CSIR ratings. *Journal of Business Ethics*, *118*(4), 791–806. doi:10.100710551-013-1961-2

León, A., Cáceres, C., Fernández, E., Chausa, P., Martin, M., Codina, C., ... Blanco, J. L. (2011). A new multidisciplinary home care telemedicine system to monitor stable chronic human immunodeficiency virus-infected patients: A randomized study. *PLoS One*, *6*(1), e14515. doi:10.1371/journal.pone.0014515 PMID:21283736

Magno, G., Comarela, G., Saez-Trumper, D., Cha, M., & Almeida, V. (2012, November). New kid on the block: Exploring the google+ social graph. In *Proceedings of the 2012 ACM conference on Internet measurement conference*(pp. 159-170). ACM. 10.1145/2398776.2398794

Mahajan, A. P., Sayles, J. N., Patel, V. A., Remien, R. H., Ortiz, D., Szekeres, G., & Coates, T. J. (2008). Stigma in the HIV/AIDS epidemic: A review of the literature and recommendations for the way forward. *AIDS (London, England)*, *22*(Suppl 2), S67. doi:10.1097/01.aids.0000327438.13291.62 PMID:18641472

Mancinelli, E. (2008). e-Inclusion in the Information Society. *Information Society. From theory to political practice. Coursebook*, 171-182.

Molyneaux, H., O'Donnell, S., Gibson, K., & Singer, J. (2008). Exploring the gender divide on YouTube: An analysis of the creation and reception of vlogs. *American Communication Journal*, *10*(2), 1–14.

Monge, R. (2007, November). Designing YouTube instructional videos to enhance information literacy. In *Brick and Click Libraries: An Academic Library Symposium.* Northwest Missouri State University.

Muessig, K. E., Nekkanti, M., Bauermeister, J., Bull, S., & Hightow-Weidman, L. B. (2015). A systematic review of recent smartphone, Internet and Web 2.0 interventions to address the HIV continuum of care. *Current HIV/AIDS Reports*, *12*(1), 173–190. doi:10.100711904-014-0239-3 PMID:25626718

Mugavero, M. J., Amico, K. R., Horn, T., & Thompson, M. A. (2013). The state of engagement in HIV care in the United States: From cascade to continuum to control. *Clinical Infectious Diseases*, *57*(8), 1164–1171. doi:10.1093/cid/cit420 PMID:23797289

Murugesan, S. (2007). Understanding Web 2.0. *IT Professional*, *9*(4).

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

Nair, M. (2011). Understanding and measuring the value of social media. *Journal of Corporate Accounting & Finance*, *22*(3), 45–51.

Ochonogor, W. C., & Okite-Amughoro, F. A. (2018). Building an Effective Digital Library in a University Teaching Hospital (UTH) in Nigeria. In Handbook of Research on Managing Intellectual Property in Digital Libraries (pp. 184-204). IGI Global.

Prensky, M. (2003). Digital game-based learning. *Computers in Entertainment*, *1*(1), 21–21. doi:10.1145/950566.950596

Quan-Haase, A., & Young, A. L. (2010). Uses and gratifications of social media: A comparison of Facebook and instant messaging. *Bulletin of Science, Technology & Society*, *30*(5), 350–361. doi:10.1177/0270467610380009

Rafferty, P., & Hidderley, R. (2007, July). Flickr and democratic indexing: Dialogic approaches to indexing. *Aslib Proceedings*, *59*(4/5), 397–410. doi:10.1108/00012530710817591

Rheingold, H. (1993). *The virtual community: Finding commection in a computerized world*. Addison-Wesley Longman Publishing Co., Inc.

Scanfeld, D., Scanfeld, V., & Larson, E. L. (2010). Dissemination of health information through social networks: Twitter and antibiotics. *American Journal of Infection Control*, *38*(3), 182–188. doi:10.1016/j.ajic.2009.11.004 PMID:20347636

Scherrer, C. S., & Dorsch, J. L. (1999). The evolving role of the librarian in evidence-based medicine. *Bulletin of the Medical Library Association*, *87*(3), 322. PMID:10427434

Sinclair, S., Bramley, G., Dobbie, L., & Gillespie, M. (2007). *Social inclusion and communications: a review of the literature*. Communications Consumer Panel.

Strand, C. (2012). Blogging: a new tool for coping and accessing psycho-social support for people living with HIV? In E-Health communities and online self-help groups: Applications and usage (pp. 106-120). IGI Global. doi:10.4018/978-1-60960-866-8.ch007

Taggart, T., Grewe, M. E., Conserve, D. F., Gliwa, C., & Isler, M. R. (2015). Social media and HIV: A systematic review of uses of social media in HIV communication. *Journal of Medical Internet Research*, *17*(11), e248. doi:10.2196/jmir.4387 PMID:26525289

Turan, B., Cohen, C. R., Bukusi, E. A., Turan, J. M., Stringer, K. L., Onono, M., & Weiser, S. D. (2014). Linkage to HIV care, postpartum depression, and HIV-related stigma in newly diagnosed pregnant women living with HIV in Kenya: A longitudinal observational study. *BMC Pregnancy and Childbirth*, *14*(1), 400. doi:10.118612884-014-0400-4 PMID:25467187

Valdiserri, R. O., Tama, G. M., & Ho, M. (1988). A survey of AIDS patients regarding their experiences with physicians. *Academic Medicine*, *63*(9), 726–728. doi:10.1097/00001888-198809000-00011 PMID:3418679

Van Dijck, J., &Poell, T. (2013). *Understanding social media logic*. Academic Press.

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

Veenstra, R. J. (1992). Clinical medical librarian impact on patient care: A one-year analysis. *Bulletin of the Medical Library Association*, *80*(1), 19. PMID:1537012

Ventola, C. L. (2014). Social media and health care professionals: Benefits, risks, and best practices. *P&T*, *39*(7), 491. PMID:25083128

Von Muhlen, M., & Ohno-Machado, L. (2012). Reviewing social media use by clinicians. *Journal of the American Medical Informatics Association*, *19*(5), 777–781. doi:10.1136/amiajnl-2012-000990 PMID:22759618

Von Muhlen, M., & Ohno-Machado, L. (2012). Reviewing social media use by clinicians. *Journal of the American Medical Informatics Association*, *19*(5), 777–781. doi:10.1136/amiajnl-2012-000990 PMID:22759618

Wu, Y., Wu, C., Li, B., Zhang, L., Li, Z., & Lau, F. (2015). Scaling social media applications into geo-distributed clouds. *IEEE/ACM Transactions on Networking*, *23*(3), 689–702. doi:10.1109/TNET.2014.2308254

Young, S. D. (2012). Recommended guidelines on using social networking technologies for HIV prevention research. *AIDS and Behavior*, *16*(7), 1743–1745. doi:10.100710461-012-0251-9 PMID:22821067

ADDITIONAL READING

World Health Organization. (2016). *Consolidated guidelines on the use of antiretroviral drugs for treating and preventing HIV infection: recommendations for a public health approach*. World Health Organization.

Haider, M., & Subramanian, A. (2004). *Analysis of Experience: The Role of Public-private Partnerships in HIV/AIDS Prevention, Control and Treatment Programming*. University Press of America.

Schiavo, R. (2013). *Health communication: From theory to practice*. John Wiley & Sons.

KEY TERMS AND DEFINITIONS

Inclusive Engagement: The action of involving every individual in an establishment by granting all equal opportunities in the decision-making process towards achieving a common purpose.

Management of HIV/AIDS: Acts involving the prevention, control, education, support, and adherence to treatment.

Medical Librarians: Librarians with knowledge of medical profession by training and certification.

Social Media: Online tools that facilitates sharing of information, photos, and videos that is available in smartphones.

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

Chapter 2
The Use of Digital Devices in Marketing Library Products in an Inclusively Engaged Academic Library

Rhodes Elias Mwageni
Teofilo Kisanji University, Tanzania

ABSTRACT

This chapter identifies critical issues in the use of digital devices, opportunities, and challenges in marketing library products and services in academic libraries. It examines empirical literature as a review method on the use of digital devices in engaged academic libraries in marketing library products and services. From the findings, it was revealed that library products and services are underutilized because of lack of marketing strategies and programs to create awareness of available resources and services in academic libraries. This resulted in negative attitudes and behaviors towards reading culture among library users. Digital devices transform and widen the reach, management, storage, and delivery of information. They make library products and services more interactive and maximize utilization of library products and services. The study shows that digital devices influenced attitudes, behaviors, and perceptions of library users positively, which shows that there is a great need to employ digital devices in marketing library products and services in academic libraries.

INTRODUCTION

Information is extricable intertwined to any society's developments. It is assumed a one of the basic needs including air, water, food and shelter. The fact that information plays a great role in all development endeavours makes it special to be stored in libraries. Library is a building where a collection of information materials are kept. The libraries work to collect, organize and make information materials available and accessible to library users. Thus, academic library is a hub of academic institutions and intellectual life. The types of libraries are based on the purpose, functions and the learning community

DOI: 10.4018/978-1-5225-9034-7.ch002

Copyright © 2020, IGI Global. Copying or distributing in print or electronic forms without written permission of IGI Global is prohibited.

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

they serve. Libraries can be categorized into four types which are academic libraries, public libraries, special libraries, school libraries and private libraries. Issa (2009) and Bothma, Cosijn, Fourie and Penzhorn (2014) state that libraries are of four types which are public or community libraries, special libraries, academic libraries and national libraries.

This study deals with the use of digital devices in marketing library products in an inclusively engaged academic library which evolved from higher learning institutions. Academic library was established to serve communities of library users in schools, college and universities. The communities served in academic libraries include: students, lecturers, researchers and external users who form the bedrock of academic library users. Amongst the services provided by academic library to intensify the utilization of library products and services are user education, exhibitions, displays and provision of information materials.

In the late 19th and 20th centuries, competitions and evolutions of digital devices led to new systems of creation of library products and services, organization, storage, dissemination and creation of awareness to library patrons on available products and services. In reciprocal, it changed the roles, attitude and behaviours of library staff and library users to inline the drives perpetuated by competitions and evolutions (Tait, Martzoukou and Reid, 2016). Consequently, academic library as an integral instrument of teaching and learning intensified the use of library products and services (Agyen-Gyasi, Lamptey and Frimpong, 2010). In this era of technologies, academic library faces a lot of challenges to effectively satisfy library users' needs and expectations. The application of digital devices in marketing library products and services have brought about challenges associated to diversity information formats, landscape, needs, expectations, attitude and behaviours of library staff and users. Studies by Madhusudhan (2008), Agyen-Gyasi, Lamptey and Frimpong (2010), Krubu and Osawaru (2011), Odine (2011), Chandratre and Chandratre (2015), Dey and Satpathy (2015) and Khan (2016) show that libraries and academic libraries in particular face a lot of challenges to effectively meet their goals of serving their communities. These include: library users' over expectations, diverse needs, wants and choices emanated from technological evolutions, poor ICT infrastructures, insufficient bandwidth, lack of knowledgeable librarians and copyright and intellectual property rights.

Rapid growth of technologies led to wide digital split in developing countries compared to developed world. This is revealed in the internet world penetration rates worldwide. Internet regional statistics indicate that internet world penetration rate in North America, Europe and Asia of 95 percent, 85.2 percent and 48.1 percent respectively compared to 35.2 percent in Africa and world average internet penetration rate of 54.4 percent (De Argaez, 2018). This entails internet rate discrepancies and that there is still a wide gap of internet penetration among regions world over. In reciprocal, digital split hinders integrating ICT in academic library in developing countries.

Other challenges facing the use of digital devices in academic libraries are such as lack of necessary ICT skills to both library users and information providers, lack of marketing library products programmes, increased costs of information materials, limited infrastructures, the increase of students enrollment in academic institutions, student-centred learning approach incompatible with new technological inventions and lack of strategies to attract users to intensify utilization of information materials, lack of expertise to integrate library users' needs and requirements, lack of skills to apply marketing in library contexts, lack of studies in the field of marketing library products and services (Agyen-Gyasi, Lamptey and Frimpong, 2010). These challenges in one way or another hinder application of digital devices in marketing and utilization of library products and services in academic library.

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

However, it was realized that the major constraint for underutilization of library products and services in academic library is lack of marketing strategies. Dey and Satpathy (2015) assessed that marketing library products and services is all about planning, identifying, defining and promoting values to satisfy library users' needs and expectations. Studies by Odine (2011), Dey and Satpathy (2015) observed that marketing library products and services are of paramount importance to create awareness on available services and information materials, increase library users satisfaction and value of academic libraries. For the sake of dealing with all these challenges, academic libraries are necessitated to adopt digital devices and marketing concepts to identify library users, determine their needs and provide relevant library products and services (Madhusudhan, 2008). Owing to the fact that the best way to accomplish academic library goals is to use digital devices to market library products and services to the library users (Okon and Umoh, 2014). It is against this background that this study investigates academic library and the use of digital devices in marketing library products in reference to the existing literature.

The study therefore is in response to addressing underutilization of library products and services, the need for attracting library users in the 'techno stress' environments and the application of digital devices in marketing library products and services in academic library. It also surveys the opportunities, challenges and associated issues related to ICT and digital devices in an interconnected world. It is an attempt to further contribute to knowledge and literature pertaining digital devices in marketing library products and services in academic library. The study presents practical implications on how to effectively plan and use digital devices in marketing library products and services to promote academic library. It examines in-depth scholarly works to provide the way forward to go about effecting digital devices in marketing library products and services.

Marketing is a process of analyzing, planning, assessing and evaluating exchange mode of goods and services. The marketing concept is not a new concept. Over years it has been used in different disciplines and several scholars had adopted it in different ways to suit their purposes. The concept was adopted from disciplines such as commerce, economics, business administration and marketing itself as an independent discipline. The concept was confined to making profit in business other than non-delivery profit oriented such as library products and services. The concept was built in a belief that libraries should not be marketed because they are social agencies meant to provide library products and services for academic achievement and lifelong learning (Anafo, 2014; Chandratre and Chandratre, 2015). The concept was changed until Ranganathan mainstreamed it in his five laws of library in 1930s (Kumar, 2014; Chandratre and Chandratre, 2015). Ranganathan's five laws articulated that books are for use, every reader has his/her book, every book has its reader, save time of the reader and library is a growing organism. These laws brought the sense that library is a market and library users as buyers or consumers of library products and services. The laws help academic library in preparing a framework to design, assess and evaluate library products, services and programmes. Marketing library products and services streamlined into marketing concepts and Ranganathan's laws for maximum utilization of library products and services. Marketing outlook in library context incorporates identification of library goals and objectives, equipping library staff with marketing knowledge and skills, analysis of users' profiles and needs, planning marketing strategies and implementation and promote and increase quality and standards of library products and services (Singh and Shukla (2009).Focusing on similar domain, library users' needs are the main focus in academic library entwined in the beliefs on Ranganathan's laws. Therefore, it was necessary for academic library to adopt marketing concept and the use of digital devices as necessary tools to satisfy users' needs and expectations (Okon and Umoh, 2014).

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

Ranganathan's five laws placed library users a major focus and the practice involved strategic planning, advertising, promotion and public relations phenomena. In India the concept of marketing library products was adopted in 1970s. However, the situation is different in developed countries where it seems the concept was adopted earlier. In the discipline of information science, marketing library products and services concept was adopted in 1970s to maintain sustainability and competitive environments of information centres such as cyber cafes, online book dealers, bookstores and internet providers. In North America, librarians started marketing library products and services earlier in 1876 (Gupta and Savard, 2010). According Singh (2013) due to digital revolutions, libraries had no options rather than adopting digital devices to facilitate marketing library products and services. Chandratre and Chandratre (2015) and Edewor, Okite-Amughoro, Osuchukwu and Egreajena (2016) affirmed that the need for marketing library products and services was adopted due to rapid information explosion, revolutions of ICT, the decline of reading attitude and behaviours, information complexities and competitive grounds where libraries were no longer the only information providers. The study by Dey and (2015), on; 'Trends in library technology and marketing of information' stressed that marketing library products and services concept was adopted due to drives of marketplace, new paradigms of managing libraries and improving library values.

In this study context, marketing library products involves analyzing, planning, and identifying information needs, appropriate formats, marketing channels and dissemination of information materials to satisfy library users' needs and expectations (Batt, Kumar and Yusuf, 2016). The adoption of marketing is mainstreamed towards formulating plans, strategies and programmes to attract wider populations to utilize library products and services. Today, ICT and application of digital devices have improved provision of library products and services. Marketing library products and services has become significant if academic libraries would like to continue providing information in this competitive digital environment. According to Islam and Islam (2009) and Anafo (2014) libraries cannot be effective unless they market their products and services to attract library users to utilize them. Marketing library products and services enables the libraries to promote the use of information materials, anticipate and identify users' needs to cope with information interventions caused by technologies, save the decline of reading culture and uphold the values of libraries and information useful in all life endeavours (Madhusudhan, 2008).

In academic context, it was realized that marketing library products and services is of paramount importance and integral part of the core missions of academic institutions to serve library users with library products and services to meet integral mission of training, research, teaching and learning. The concept of marketing library products and services expedites awareness and improve utilization of library products especially in academic libraries. Therefore, marketing library products and services is an integral part of librarianship and important virtue to library staff and users. Due to the complex nature of attitudes and behaviours of library staff and users towards library products and services, there was a great need for the academic libraries to adopt different interventions to ensure maximum utilization of academic libraries.

For academic libraries to address challenges in marketing library products and services and fulfill core missions of academic institutions were not divorced from digital devices. Hussain, Khan and Zaidi (2013) confirmed that academic libraries had no options but to adopt marketing strategies, ICT and digital devices as a new paradigm to satisfy users' needs and expectations, increase performance and compete with other information providers. This necessitated academic libraries to adapt marketing strategies tandem with digital devices. These are the general terms used to explain technologies integration

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

into library operations. In a wider scope, digital devices describe applications in information creation, management, storage and dissemination (Omosor, 2014).

The major integral tools used in marketing library products include library websites, web 2.0 and webmaster for designing library portals thereby fulfilling users' needs through cross searching and digital references (Veeramani and Vinayagamoorthy, 2010; Bishop and Rowley, 2012; Khan and Bhatti, 2012). Hence, academic libraries integrated digital devices to market library products via websites, e-mails, social media, blogs, databases and web pages. This resulted to greater preference for digital resources and services among library users (Emezie and Nwaohiri, 2015).

Engaging digital devices in marketing library products and services has been vital in dissemination and communication of information to both library staff and users. Digital devices have improved positive attitude and collaborative approach in teaching and learning processes to academic staff and students (Tait, Martzoukou and Reid, 2016). The adoption of digital devices facilitated the marketing interventions and reduced the tedium in library operations. It opened up effectiveness in marketing library products and services (Bhardwaj, 2016). Digital devices widened the scope of marketing library products and services through sophisticated means world over. They play an important role in this regard because they facilitate quick and easy marketing practices. Digital devices ameliorated easy access of online information materials, improved marketing library products and services, information materials scope and library operations (Igbokwe, Ezeji and Obidike, 2010; Chegwe and Anaehobi, 2015).Also, digital devices enabled interactive communication between the library users and information providers (Bishop and Rowley, 2012). They help appropriate library organization, preservation, conservation, arrangement and facilitate patrons' awareness, retention and utilization of library products and services in academic library (Bhatt, Kumar and Yusuf, 2016). In addition, digital devices expedite library patrons to access online sources of information, enhance competitiveness in information provision, use the information and give feedback through statistical databases for assessment and evaluation to improve library products, services and operations (Hussain, Khan and Zaidi, 2013).

Furthermore, digital devices provided library users with information, knowledge and motivation to use the library products and services. The use of digital devices have enabled library users to acquire skills, competences and understanding on how to access and use information materials in academic libraries (Patil and Pradhan, 2014). This is achieved through information literacy programmes, workshops, seminars and training. Similarly, Dongardive (2013), in the study on; 'Marketing library and information services' opines that marketing library products helps to understand library users' dynamics and impart necessary skills to select useful information in this era of information explosions.

Recognizing the importance of marketing library products in academic library, Igbokwe, Ezeji and Obidike (2010)and Aderibigbe and Farouk (2017)conceded that marketing library products is a fundamental practice to maximize utilization of library products and services to their capacities. Marketing library products and services has yielded positive results towards creating knowledge, awareness and competence to library users in the age of ICT and digital devices. This has not only changed the fundamental nature of academic libraries but also increased the vitality, viability and sustainability of library products and services (Crawford, 2015). This view is supported by Emezie and Nwaohiri (2015) who reported that in recent years technologies have changed the roles of academic libraries which include: the trend of information provision, electronic means of communication and preservation in libraries and information centres. The study by Mitra (2016) claimed that adoption of ICT has changed attitude and behaviours of young generation. For the sake of coping with new marketing paradigms, information professionals started to equip themselves with knowledge and skills to adopt interventions in marketing

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

library products and services. They were required to understand library users' perceptions, attitude and behaviours, skills to obtain feedback from library users, how to use digital devices such as computers and marketing skills and strategies (Chandratre and Chandratre, 2015).

The advent of ICT and adoption of digital devices in marketing library products and services created expectations that academic library resources would be well utilized (Kaur and Rani, 2008).Hence, academic libraries the world over have adopted various interventions to facilitate utilization of library products and services. As a result, schools, colleges and universities invest on digital devices for interventions in marketing library products and services. It was also expected that marketing library products and services would attract library users to visit academic library and influence positively their reading attitude and behaviours (Mitra, 2016). However, studies show that there is a decline of utilization of library products and services in academic libraries. Ukachi, Onuoha and Nwachukwu (2014) revealed that reading resources in academic libraries are underutilized because of a lack of reading attitude and behaviour of patrons. Therefore, evolutions of technologies assumed to result to negative attitude and behaviours to use library products and services and younger people assume technologies as a cheap solution of everything in life endeavours. Adegoke (2015) agrees that there might be ineffectiveness in marketing library products and services as it is reported low frequency of library visit and underutilization of library products and services in academic libraries. This has resulted to a general feeling that academic institutions waste time, funds and energy to market library products and services devoid expectations to effecting positive utilization of library products and services in academic libraries. The relationship between marketing library products and services and underutilization of library resources in academic libraries needs to be addressed. This study therefore maps the use of digital devices, opportunities and challenges towards engaging digital devices in marketing library products and services in academic library and way forward.

LITERATURE REVIEW

Marketing library products and services involves activities which foster to create awareness of resources available in libraries as noted by the study by Odine (2011) which revealed that marketing library products and services serves to achieve library objectives and creates awareness to the library users on the information materials and services available in the libraries. Consistently, the study by Okon and Umoh (2014) revealed that marketing library products and services serves to educate library staff and users, create positive attitudes, behaviours and perceptions of library users towards library products and services, increase visits and efficient usage of library products and services hence increase relevance of academic libraries in achieving academic performance and life endeavours.

DIGITAL DEVICES APPLICATION IN MARKETING LIBRARY PRODUCTS AND SERVICES OVERVIEW

Traditionally, customer care, exhibitions and displays were techniques mostly used to marketing library products (Odine, 2011). The evolution of ICT and digital devices enhanced marketing library products and services. This was reinforced by the fact that it was an inevitable paradigm shift in which academic libraries had to adapt to suit competitive environments and library users' needs and expectations (Singh,

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

2013). Digital devices have changed the scope of marketing library products. The library products and services which prior were located in print formats are currently accessible via technologies. Veeramani and Vinayagamoorthy (2010) and Adegoke (2015) are of the opinions that digital devices have supported marketing library products and services and library clientele are able to access information materials in digital sources. This led to satisfy academic library users' needs and expectations hence to increase utilization of library products and services which in turn influenced on students' academic achievement and individual lifelong learning for personal and national developments.

The use of digital devices in marketing library products and services has brought both opportunities and challenges. Amongst of the opportunities associated to ICT and digital devices are the greater impact in library users' needs, expectations and satisfaction. Digital devices created a number of opportunities to include: quality information services delivery, demands, scope of research, availability and accessibility (Edewor et al., 2016). Other opportunities include: timely provision of information, adequate information, relevant formats as per the users' needs and expectations and enabling environments for the academic libraries to compete with other information providers (Adekunmisi, 2013). ICT and application of digital devices in academic libraries saves time, resources and labour as most of the library operations and services are made easier as digital resources are accessible without boundaries worldwide (Singh, 2013). The study by Bishop and Rowley (2012), on; 'Digital marketing in independent libraries in the United Kingdom' found that the use of digital devices in marketing library products and services clearly define the value of academic libraries.

The challenges associated to marketing library products and services include: negative attitude and behaviour of librarians towards application of digital devices, lack of enough funds to facilitate marketing library products and services using digital devices, lack of ICT knowledge among librarians and library users, lack of realization of the value of information and complexity nature of studying attitude and behaviours of librarians and library users (Bishop and Rowley, 2012; Okon and Umoh, 2014). They also observed that most of academic libraries in the United Kingdom use traditional tools in marketing library products and services because of lack of digital integrated marketing policy. Besides, academic libraries have no independent websites as a tool to market library products and services. The study by Brown and Swan (2007) found that the rapid growth of information materials has created a new challenge in marketing library products and services associated to data management, storage, preservation and dissemination in academic libraries. Singh (2013), on the study of 'ICT and its impact on library and information services in universities in India' lauds that library staff and users lack confidence and motivation to use digital resources and education systems do not accommodate integration of ICT in teaching and learning processes.

Chegwe and Anaehobi (2015) viewed the use of digital devices as a threat to the existence of librarianship and academic libraries as patrons no longer pay physical visits to the libraries as library products and services are accessible remotely through digital devices. This causes underutilization of academic libraries because library users rely on computers, laptops and mobile phones to access library products and services. Tait, Martzoukou and Reid (2016) observed that the fact that library users can now access library products and services without physical library visit, this causes the decline of library visits as the majority of students access library products and services in digital formats. The study by Ryan (2013) groups challenges in adopting digital devices in three major areas. These include: lack of technological skills among library staff and users, lack of modern digital devices and copyright issues. Ryan is of the view that librarians and library users lack modern digital devices and necessary skills to use digital

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

devices to access library products and services. This is because most academic libraries especially in developing countries still use outdated digital devices due to incapacity to acquire modern ones.

Igbokwe, Ezeji and Obidike (2010) found that the challenges facing marketing library products include: inadequacy of funds, poor library infrastructure, lack of library professionals and dearth of necessary resources in academic libraries. Similarly, Odine (2011) and Aderibigbe and Farouk (2017) are of the view that unwillingness of library staff to market library products, lack of skills and competence of staff and library users, limited social media, dearth of libraries, underutilization of library products and services, lack of policy to guide marketing library products and services and ineffective marketing strategies.

The study by Schmidt (2006), on; 'Marketing library and information services in Australian academic libraries' posits that the challenges facing marketing library products through digital devices include: poor ICT interventions to integrate digital devices into marketing library products and services, negative attitude and behaviours of librarians towards digital devices, lack of skills and competence of information providers and new teaching and learning processes. In the same vein, the study by Islam and Islam (2009) found that amongst the challenges of marketing library products are ignorance over marketing strategies, negative attitude of users toward information and complex nature of marketing interventions. Kaba (2011) indicated two hindrances towards marketing library products and services including users do not visit websites as a tool of marketing library products.

Khan and Bhatti (2012) view lack of knowledge and training of library users as challenges towards using digital devices to marketing library products and services. According to Chegwe and Anaehobi (2015) challenges associated with marketing library products are lack of funds, dynamics of user's needs and expectations. Edewor *et al.* (2016) showed that poor use of social media to market library products, lack of marketing strategic plan, ignorance on what to market and what not to and lack of facilities are the barriers towards using digital devices to marketing library products and services. In addition, Yi (2016) in his study observed other variable which hinder application of digital devices in marketing library products and services to include demographic, human capital and perceptions of library staff and users. Also, reluctance of some of academic libraries to adopt marketing concept poses challenges to effectively make library products and services utilized. This might be because many academic libraries depend on their mother institutions to operate which hinder application of digital devices and autonomous creativity to market library products and services (Patange, 2013).

Another major challenge in applying digital devices in marketing library products and services is about copyright and intellectual property rights. This is all about exclusive right granted to the originator to protect and regulate the use of creative works. There are specific copyright laws under Berne Convention and World Intellectual Property Organization (WIPO) later ratified by member states to inline their environments and cultures which are the treaties to protect literary and artistic works. Copyright and intellectual property rights in digital era distinguished copyright into four components as follows: software copyright which illuminates authorizing license to use digital materials without committing software piracy, copyright law and the internet which regard any information uploaded in the internet is bound to copyright laws regardless they are without copyright notice and labelled "free access", Digital Rights Management (DRM) which demonstrates digital systems to encrypting digital contents to be accessed by observing copyright laws and marking them with digital watermarks to protect creativity of the originators, copyright and social media which put forward policies and intellectual property rights for social media such as facebook, instagram, whatsup, twitter, linkedln, pinterest, viber, tumblr, weChat, wikia, imo and snapchat. However, it was reported in the study by Edewor et al. (2016) that there is low level of using social media to market library products and services.

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

Digital devices application also raised some challenges of dealing with copyright infringement in cyberspace (Nasir, Ponnusamy and May, 2007). From this, the challenge associated to marketing library products and services in the digital, copyright and intellectual property environments includes unfamiliarity of staff and library users over copyright and intellectual property rights to use digital materials. The study by Palfrey, Gasser, Simun and Barnes (2009), on; 'Youth, creativity and copyright in the digital age' and Kaba (2011), on; 'Marketing information resources and services in United Arab Emirates' found that the majority of digital realm users lack copyright laws and fair use knowledge. Library users and youth in particular, engage in downloading and use digital contents without any consideration of copyright laws. This was caused by the notion of taking into granted that any information found from digital devices are from free domain without any consent from originators. In addition, the boarder less and viral nature of communicating information materials from digital devices caused challenges not only to the information users but also information originators (Nasir, Ponnusamy and May, 2007). In this context, librarians and library users have to be aware of copyright right laws ratified from international organizations in their respective countries. Foristance, the US came up with the Digital Millennium Copyright Act (DMCA),Canada formed Canadian Intellectual Property, Malaysia created Malaysia Copyright Laws, the United Kingdom instituted the UK Digital Economy Act and The European Union (EU) Copyright Laws for the European Union and Tanzania established United Republic of Tanzania Copyright and Neighboring Rights Act which are basically concerned with protecting the rights and use of creative works.

At present many countries are aligning existing copyright and intellectual property rights with digital environments as new evolutions. The process of adopting digital contents in academic libraries and archives include: online copyright infringement liability limitation, computer maintenance and repair and phonogram in electronic resources. Also, copyright issues involve moral and economic rights. There are advantages associated with ratification of copyright laws in the digital age. These include: it evokes creativity and protecting the information originators and creation of awareness on copyright and intellectual property rights in digital age. Therefore, the understanding of copyright laws by librarians and patrons would enhance better use of digital contents (Ryan, 2013).

There are challenges in adopting copyright and intellectual property rights in digital age especially demarcation between fair use of digital contents and copyright and intellectual property rights. Shear (2010) asserts that the challenge encountered by authors, scholars, researchers, librarians and library users in using digital contents is unclear difference of fair use between digital materials with copyright infringement and those without copyright permission. However, there is ongoing debate on amorphous and unpredictable balance, guidance and scope between fair use of digital resources and copyright and intellectual rights which advocate making information readily available to everyone (Lafeber and Saunders, 2008). Lafeber and Saunders (2008) and Shear (2010) identify four factors for the digital contents originators and users to consider making value of their scholarly works. These include: (1) the purpose and use of digital contents whether for commercial, educational or non-educational purposes (2) the nature of copyrighted or without copyright permission and if the digital contents are all about facts or opinions (3) the amount of copyrighted digital materials used in the literary work compared to that without copyright permission (4) the impact of literary work as per the market drives and values of the copyrighted digital contents and that without copyright permission. Though other signatory states such as Canada and UK recognize fair dealing aligned with copyright and intellectual rights rather than fair use.

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

LIBRARY PRODUCTS AND SERVICES- MARKETING STRATEGIES: AN OVERVIEW

The effectiveness of academic libraries depends on marketing strategies. Marketing strategies enable academic libraries to attract library users for the sake of fulfilling academic library goals. Marketing creates a belief to library staff and users over the quality and types of library products and services which in turn influence utilization of academic libraries. Marketing library products and services help to determine needs and expectations of the library users, their attitude and behaviours towards library products and services. It enables information providers to design appropriate strategies to achieve academic library goals (Patange, 2013). According to Anafo (2014) marketing strategy patterns involve policies, programmes and guidelines to monitor, assess and evaluate marketing library products and services. According to Singh and Shukla (2009) marketing strategies enhance academic libraries and functions as analysis of users' requirements yardstick, getting across new products and services, controlling quality and standards of library products and services. Therefore, the purposes of marketing strategies are coined in three elements such as to raise library users' expectations over library products and services, evoke information providers' motivation to adopt various technologies to serve what is potential to the library users and in terms of economy, marketing strategies can serve as a source of income to reduce dependence on sponsors who sometimes influence selection of information materials to inline their personal interests.

In a broader view, the adoption of digital devices in marketing library products and services should consider users' needs, expectations and the goals of specific academic library. In addition, there are things librarians should consider in applying digital devices in marketing library products and services. These include: studies to identify specific needs and expectations, understanding of the nature of information as per the needs of users, dimensions of libraries in this technology era and specific policies of the countries (Patange, 2013). Marketing strategy patterns should examine users' needs useful in designing programmes. Anafo assets that in the context of marketing library products and services, there are marketing strategies as follows:

1. **Analysis**: Includes setting up goals, objectives and integrating them into library user's needs and expectations.
2. **Planning**: Involves preparing action plan for practical activities to undertake.
3. **Implementation**: Through action plan, programmes are extracted and put into practical activities to improve library capabilities to satisfy library users' needs and expectations.
4. **Evaluation**: This is done after lengthy assessments to pinpoint strengths and weaknesses of the marketing strategies employed in the due course. This process helps for the librarians to map a way forward towards improving application of digital devices in marketing library products and services.

Furthermore, Odine (2011) delineates that there are specific skills to effectively market library products and services. These include: abilities to assess and evaluate library products and services, competencies in interrogating and attending users' demands. There are specific tools used as marketing strategies include orientation, websites, flyers, bulletins, newsletters.

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

METHODOLOGY

This study surveys and examines empirical literature as a review method on the use of digital devices in marketing library products and services in academic libraries. The study covered application of digital devices in marketing phenomena of library products and services, opportunities and challenges in applying digital devices in marketing library products and services, various observations and discussions on marketing concept adoption to develop strategies to market library products and services. The literature to understand the concept of marketing, adoption of marketing concepts in marketing library products and services, the use of digital devices in marketing library products and services in academic library and the challenges and opportunities of applying digital devices in marketing library products and services include: books, journals, theses, electronic databases (Google, Google scholar and Emeralds)and reports. The literature search employed various terms such as "marketing", "digital devices" "marketing library products and marketing information services". Also, keywords were combined to search for the literature such as "marketing information services and academic library", "marketing library products and academic library", "library products and services and digital devices". The literature related to "marketing", "marketing library products and services" and "use of digital devices in marketing library products and services" world over were selected. The literature reviewed were analysed in the light of four patterns of digital devices, marketing products and services and academic library, compared and contrasted to build the gaps for further studies. The study presented practical application of digital device patterns in marketing library products and services in academic library.

RESULTS

The study reports the results from a larger literature survey to investigate the use of digital devices in marketing library products and services in academic libraries. The study revealed that library products and services are underutilized because of lack of marketing strategies and programmes to create awareness of available resources and services in academic libraries. This collaborates with the study by Gakibayo, Ikoja-Odongo and Okello-Obura (2013) which opined that apart from workshops, seminars and other communications to university students on availability and accessibility of e-resources in academic libraries are underutilized. Jankowska, Hertel and Young (2006), in the study of; 'Improving library services quality to graduate students at University of Idaho (UI) found out that graduate students were not aware of library products and services available in academic library hence there still a necessity to apply digital devices to market academic libraries. The study also revealed that academic libraries underutilization is the results of negative attitude and behaviours towards reading culture among library users. This might be because library users are not aware of the value of reading culture in their daily life, devotion of little time on reading compared to watching television, chatting on facebook, instagram, whatsup, twitter, linkedln, pinterest, viber, tumblr, weChat, wikia, imo and snapchat, irrelevant and outdated information materials and services, lack of necessary knowledge and ICT skills among library staff and users, lack of marketing strategies to market library products and services, perceptions of library staff and users that reading is a practice associated to schooling and obtaining good marks in assignments, tests, projects and examination and not for acquiring knowledge, skills, experiences and information for life endeavours.

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

Also, the study revealed that the influence of digital devices changed attitudes, behaviours and perceptions of library users which made easier accessibility of information and libraries retain library users to visit and use library products and services. Nasir, Ponnusamy and May (2007) laud that digital age has impacted low costs of processing, sharing and communicating information from libraries to information users. The results conform with the studies by Krubu and Osawaru (2011) on; 'The impact of information and communication technology (ICT) in Nigerian university libraries', Gakibayo, Ikoja-Odongo and Okello-Obura (2013) on; 'Electronic information resources utilization by students in Mbarara University Library in Uganda' stated that technologies have shaped academic libraries in terms of collection development strategies, acquisition, processing, storage, access, retrieval and dissemination of information to the stakeholders. Similarly, Adamou(2017), on the study of; 'The impact of digital technologies on academic libraries in Greece', digital devices application in academic libraries have improved attitudes and behaviours of library staff and users towards the use of library products and services.

This study revealed various opportunities associated with marketing library products and services. Studies by Jankowska, Hertel and Young (2006), Tait, Martzoukou and Reid (2016) opined that the use of digital devices has increased availability, easy access of library products and services library users' satisfaction and positive attitude and behaviours towards reading for academic achievement and life endeavours. Kenneway (2007) noted that digital devices have changed modality of teaching and learning, communicating and the way of doing researches for intellectual growth. Also, the study revealed that the impact of digital devices reinforced schools, colleges and universities to embed marketing programmes in curricular to equip librarians and library users with practical skills, knowledge, understanding library users needs and expectations, creating awareness, interest and value towards marketing library products and services. These inline with studies of Mohseni (2007), on; 'Marketing plan for Kajaani University of applied sciences library', Saxena, Yadav (2013), on; 'Impact of mobile technology on libraries in India', Connaway (2015), on; 'The library in the life of the users: Engaging with people where they live and learn' and Drake (n.d), on; 'The impact of electronic information on library and documentation center organization and services'. However, academic libraries still face with underutilization of library products and services perpetuated by challenges to marketing library products hindering attracting library users to utilize library resources.

DISCUSSION

The importance of marketing strategies emanate in five factors including; facilitation and fulfillment of library goals and objectives, changing the scope of libraries as store houses of knowledge to boundary less accessible library products and services to inline technological revolutions. This would promote availability and accessibility of information, changing attitudes, behaviours and perceptions of librarians and library users towards information and enabling assessment and evaluation of library operations to improve library products and services provision (Islam and Islam, 2009). It is imperative that academic libraries have been transformed by ICT to render relevant products and services to pace with modern academic world.

However, ICT developments threatened librarianship as a profession that librarians would remain redundant and their roles being replaced by digital devices. On contrary, librarianship roles remained the same but changed to accommodate digital era to meet library users' needs, expectations and the interventions of digital devices in marketing library products and services. This resulted to academic libraries

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

to establish new roles and techniques to provide services to the library users. The technical part of the new roles of academic libraries became a challenge to librarians as well as library users.

CONCLUSION

This study sought to examine the use of digital devices in marketing library products and services in academic libraries. Academic libraries have been and still play a great role to transform library products and services, widening up the reach, management, storage and delivery. The study presented the adoption of digital devices for serving a diversity of library users' demands stimulated by developments of technologies. The study affirms the positive impact of digital devices in expedition of utilization of academic libraries. Also, the study revealed that there is a great need for employing digital devices in marketing library products and services in academic libraries.

As indicated in the study, there is a general positive feedback on the impacts of ICT and applications of digital devices in academic libraries. However, the adoption of digital devices in marketing library products and services likely leads to opportunities and challenges. The study indicated that the application of digital devices transformed academic libraries in terms of library products, infrastructures and services. According to Head (2016) digital devices have affected academic libraries especially in the library resources, library design, physical facilities and library staff's attitude and behaviours towards information provision. This is in consonance with the study by Brown and Swan (2007), on; 'Researchers' use of academic libraries and their services' revealed that researchers have changed their attitudes and behaviours hence prefer online journal articles to other information materials. Consistently, Bothma et al. (2014), on; 'Navigating information literacy' noted that digital devices have made copyright and intellectual property issues easy though the principles still applicable. Also, pedagogies in teaching and learning processes facilitated changes in the academic library scope of information delivery under the umbrella of copyright laws in the digital age.

There have been various efforts of integrating digital devices in all library operations. This study presented overview of some of the key phenomena where marketing library products and services using digital devices, application in academic libraries, opportunities and challenges. In particular, academic libraries have adopted digital devices in at least all area pertaining to library services, information delivery, marketing library products, assessment and evaluation of library services. Though, there is uneven adoption of digital devices in marketing library products and services. In particular, this is a case of digital divide among countries world over.

Academic libraries have endeavoured to adopt digital devices to market library products and services which in reciprocal increases their patronage. But there are challenges hinder the development of adopting digital devices in marketing library products and services. In general, the major challenge facing today's academic libraries is to merge traditional and digital collections to satisfy library users' needs and expectations in this dynamic digital generation. But in marketing library products and services, it is evidenced that traditional way of marketing is no longer useful and safe to satisfy library users' information thirsty. Islam and Islam (2009) highlight challenges to marketing library products as follows: thinking stereo types of library staff and library users towards digital devices, attitude, behaviour and perception that marketing is only for profit making businesses, lack of skills, techniques and knowledge amongst information providers on marketing library products and services, lack of marketing library

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

products and services policy, strategies and programmes, lack of funds and lack of studies on marketing products and services.

RECOMMENDATIONS

Marketing library products and services is of paramount importance in academic libraries as a means of creating knowledge, understanding and awareness. Academic libraries should not continue assuming that they are the only sources of library products and services in this digital revolution. Based on the study results, the main recommendations for this study are as follows: there is a need for more interventions to meet integral goals of academic libraries in developing countries (Gakibayo, Ikoja-Odongo and Okello-Obura, 2013). Academic libraries should enable librarians and library users engage and learn about marketing strategies, technical knowledge such as the use of digital devices in marketing library products and services. There should be shared marketing strategies, collaborative working between academicians and library staff, knowledge transfer, assessment and evaluation of best practice guidelines of adopting digital devices in higher learning institutions. Within fast technological changes, there should be interventions through training and workshop programmes and integrate marketing skills and knowledge in staff development plans. It was also recommended that:

1. Funds should be allocated for library developments, marketing facilities, training, conferences, short courses, workshops, and seminars and curricular of marketing courses in academic institutions should be initiated and should be integrated into information science curricular in all levels of education.
2. (Islam and Islam, 2009; Oden, 2011).
3. Academic libraries should acquire up-to-date information materials to ensure clienteles visit and utilize library products.
4. Publicity and human relations should be observed by both librarians and clientele.
5. Academic libraries should lobby for specific marketing library products policy, constitute committee and budget for sustainability satisfaction of users' needs and expectations.
6. Academic librarians should be trained to apply ICT and creatively use local resources in marketing library products and services in academic libraries.
7. Academic institutions should facilitate conduction of more studies to widen up understanding and knowledge on marketing library products and services.
8. Digital contents should be ensured copyright protection for the validity, reliability and value of scholarly works (Shear, 2010).

Mitra (2016), on the study of; 'Promoting library services in the digital era' proposed that there should be interventions on marketing library products through "One Stop Info" a strategy which library users are directed automatically to the webpage without going anywhere else. Other strategies include: Web Opac which is accessible through web, tabs and mobile phones to market library products, e-books through e-reader linked to webpage, improving library infrastructure, staffing professional librarians and collection development as per the users' needs and expectations. Besides, Chegwe and Anaehobi (2015) claimed that together with the challenges facing academic libraries including the decline of using library products and services, there is a necessity to promote library products and services through marketing

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

strategies. They suggested that librarians should be equipped with skills, knowledge through seminars, workshops, courses and conferences as capacity building to pace with global challenges and information abundant. Shear (2010) concludes that for the signatory states to comply with international copyright laws, there should be a close relationship between copyright international organization and signatory states to guide and regulate digital contents and electronic media. Also, there should be monitoring by international organization in ratification of copyright laws to inline constitutional laws of their respective countries. Furthermore, Palfrey et al. (2010) recommend that there should be interventions in curricular to doctrine educators and students in copyright laws.

There is a need to redesign library building and facilities to inline users' changing learning and technological needs brought by digital era. Librarians, architects and information technologists should work together in planning and designing library infrastructures and facilities (Head, 2016).Similarly, the study by Okon and Umoh (2014) on; 'Marketing of information and library services in Nigerian university libraries' recommended that in order to satisfy library users' needs and expectations, academic libraries should create conducive environments to attract library users visit and utilize library products and services. There should be alternative of source of power supply as most of the libraries especially in developing countries experience frequent power cuts.

In order to maintain subscription of print and e-resources to ensure availability of library products and services, academic libraries should find out other sources to raise funds for library products and services and to incorporate marketing programmes and strategies in the yearly plans and strategic plans. Finally, there should be interventions to employ and retain technical library staff to facilitate the use of digital devices to maximize utilization of library products and services in academic libraries (Omosor, 2013).

REFERENCES

Adamou, S., & Ntoka, L. (2017). *The impact of digital technologies on academic libraries: A study in Greece.* Retrieved on 3rd May, 2018 from http://lnu.diva-portal.org/smash/get/diva2:1129431/FULLTEXT01.pdf

Adegoke, K. A. (2015). Marketing of library and information services in university libraries: A case study of UsmanuDanfodiyo University Library, Sokoto-Nigeria. *Intel Prop Rights, 3*, 143. Retrieved on 31st December, 2017 from https://www.omicsonline.org/open-access/marketing-of-library-and-information

Adekunmisi, S. R. (2013). Strategies for marketing library services and information products in Nigeria. *Global Advanced Research Journal, 2*(12), 240-245. Retrieved on 10st January, 2018 from file:///C:/Users/215080593/Downloads/strategies%20for%20marketing%20library%20s

Aderibigbe, O. A., & Farouk, B. L. (2017). Challenges on marketing of information resources and services in federal university libraries in North-West Zone of Nigeria. *International Journal of Academic Library and Information Science, 5*(3), 92-96. Retrieved on 31st December, 2017 fromhttp://www.academicresearchjournals.org/IJALIS/PDF/2017/May/Aderibigbe%20and

Agyen-Gyasi, K., Lamptey, R. B., & Frimpong, A. (2010). *Academic librarians' role in maximizing library use in Ghana.* Retrieved on 20th February, 2018 from http://ir.knust.edu.gh/bitstream/123456789/561/1/ACADEMIC%20LIBRARIANS%20

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

Anafo, P. (2014). Marketing strategies for information services: A case study of the institute of chartered accountants (Ghana) library and information services. *Library Philosophy and Practice*. Retrieved on 05th January, 2018 from https://digitalcommons.unl.edu/cgi/viewcontent.cgi?referer=https://www.google.co.za/

Bhardwaj, R. K. (2016). Marketing of library resources and services: A structured literature review. *DESIDOC Journal of Library and Information Technology*, *36*(3), 119–125. doi:10.14429/djlit.36.3.10027

Bhatt, R. K., Kumar, A., & Yusuf, M. (2016). Marketing of LIS products and services in select economics libraries in Delhi. *DESIDOC Journal of Library & Information Technology, 36*(3). Retrieved on 30th December, 2017 from file:///C:/Users/TEMP.UKZN.021/Downloads/9794-27723-1-PB.pdf

Bishop, T., & Rowley, J. (2012). Digital marketing in independent libraries in the United Kingdom. *Journal of Librarianship and Information Science*, *45*(4), 323–334. doi:10.1177/0961000612453473

Bothma, T., Cosijn, E., Fourie, I., & Penzhorn, C. (2014). *Navigating information literacy: Your information society survival toolkit* (4th ed.). Pearson.

Brown, S., & Swan, A. (2007). *Researchers' use of academic libraries and their services: a report commissioned by the Research Information Network and the Consortium of Research Libraries.* Retrieved on 3rd April, 2018 from http://www.rin.ac.uk/system/files/attachments/Researchers-libraries-services-report.pdf

Casali, G. L., Perano, M., & Abbate, T. (2017). Understanding roles and functions of academic libraries as innovation intermediaries within the service-dominant logic perspective: An Australian case study. *Journal of Library Administration*, *57*(2), 135–150. doi:10.1080/01930826.2016.1211400

Chandratre, S., & Chandratre, M. S. (2015). Marketing of library and information services. *Journal of Commerce & Management Thought*, *6*(1), 162–175. doi:10.5958/0976-478x.2015.00011.7

Chegwe, A. O., & Anaehobi, S. E. (2015). Academic Librarians Perception and Attitude towards Marketing of Library Services in Delta State, Nigeria. *Library Philosophy and Practice*. Retrieved on 28th December, 2017 from http://digitalcommons.unl.edu/cgi/viewcontent.cgi?article=3434&context=libphilprac

Connaway, L. S. (2015). *The library in the life of the user: Engaging with people where they live and learn*. OCLC Online Computer Library Center, Inc. Retrieved on 16th May, 2018 from https://www.oclc.org/content/dam/research/publications/2015/oclcresearch-library-in

Crawford, A. (Ed.). (2015). *The meaning of the library: A cultural history.* Princeton University Press. Retrieved on 27th April, 2018 from https://www.ideals.illinois.edu/bitstream/handle/2142/79053/John%20P.%20Wilkin%2

De Argaez, E. (2018). *Internet world penetration rate*. Retrieved on 19th April, 2018 from https://www.internetworldstats.com/stats.htm

Dey, S., Satpathy, D., & Chandra, K. (2014). *Marketing of information services in libraries: Trends in library technology & marketing of information*. Retrieved on 20th April, 2018 from https://ssrn.com/abstract=2977896

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

Dongardive, P. (2013). Marketing library and information services. *International Journal of Science and Research*, *2*(11), 227–234. Retrieved from https://www.ijsr.net/archive/v2i11/MDIwMTM0NDg=.pdf

Drake, M. A. (n.d.). The impact of electronic information on library and documentation center organization and services. *JornadesCatalanes de Documentació, 7*(99). Retrieved on 16thMay, 2018 from http://www.cobdc.org/jornades/7JCD/drake.pdf

Edewor, N., Okite-Amughoro, F., Osuchukwu, N. P., & Egreajena, D. E. (2016). Marketing library and information services in selected university libraries in Africa. *International Journal of Advanced Library and Information Science, 4*(1), 291-300. Retrieved on 01st January, 2018 from file:///C:/Users/215080593/Downloads/386-1171-2-PB.pdf

Emezie, N. A., & Nwaohiri, N. M. (2013). 21st century librarians and effective information service delivery. *Information Impact: Journal of Information and Knowledge Management, 4*(1), 30-43. Retrieved on 25th April, 2018 from https://www.researchgate.net/publication/282979435_21st_century_librarianns

Gakibayo, A., Ikoja-Odongo, J. R., & Okello-Obura, C. (2013). Electronic information resources utilization by students in Mbarara University Library. *Library Philosophy and Practice (e-journal), 869*. Retrieved on 9th April, 2017 from http://digitalcommons.unl.edu/libphilprac/869

Gupta, D. K., & Savard, R. (2010). *Marketing library and information services*. Taylor & Francis. Retrieved on 01st January, 2018 from http://www.mapageweb.umontreal.ca/savardr/pdf/Gupta_Savard_ELISbis.pdf

Head, A. J. (2016). *Planning and designing academic library learning spaces: Expert perspectives of architects, librarians, and library consultants*. Retrieved on 2nd April, 2018 from http://www.projectinfolit.org/uploads/2/7/5/4/27541717/pil_libspace_report_12_6_16

Hussain, A., Khan, M. A., & Zaidi, N. F. (2013). The ICT based library and Information services: A case study of B-Schools in Delhi and NCR region. *Library Philosophy and Practice*. Retrieved on 2nd May, 2018 from https://digitalcommons.unl.edu/cgi/viewcontent.cgi?referer=https://www.google.com

Hussain, A., & Kumar, K. (2013). Utilization of information resources and services of the master school of management library: A study. *International Journal of Library Science*, *9*(3), 39–52. Retrieved from https://www.researchgate.net/profile/Akhtar_Hussain4/publication/236861848

Hussain, A., & Lavanya, N. (2014). *The impact of ICTs in library and information services at Indus Business Academy, Bangalore*. Retrieved on 2nd May, 2018 from https://www.researchgate.net/publication/270279059_The_impact_of_ICTs_in_library

Igbokwe, J. C., Ezeji, E. C., & Obidike, N. A. (2010). Problems militating against marketing of library services in selected Nigerian libraries. *Journal of Applied Information Science and Technology, 4*. Retrieved on 31st December, 2017 from https://www.researchgate.net/publication/268504867_Problems_Militating_against

Islam, M. S., & Islam, M. N. (2009). Marketing of library and information products and services: A theoretical analysis. *Business Information Review*, *26*(2), 123–132. doi:10.1177/0266382109104414

Issa, A. O. (2009). *Fundamentals of library and information science*. Retrieved on 27th April, 2018 from http://elibrary.bsu.az/books_rax/N_24.pdf

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

Jankowska, M. A., Hertel, K., & Young, N. J. (2006). Improving library service quality to graduate students: Libqual+ TM survey results in a practical setting. *Portal: Libraries and the Academy, 6*(1), 59-76. Retrieved on 15thMay, 2018 from http://www.libqual.org/documents/admin/Jankowska_Hertel_Young.pdf

Kaba, A. (2011). Marketing information resources and services on the web: Current status of academic libraries in the United Arab Emirates. *Information Development*, *27*(1), 58–65. doi:10.1177/0266666910394625

Kaur, A., & Rani, S. (2008). Marketing of information services and products in university libraries of Punjab and Chandigarh (India): An attitudinal assessment of library professionals. *Library Management*, *29*(6/7), 515–537. doi:10.1108/01435120810894536

Kenneway, M. (2007). Marketing the library: Using technology to increase visibility, impact and reader engagement. *Serials, 20*(2). Retrieved on 16thMay, 2018 from file:///C:/Users/Rhodes%20Mwageni/Downloads/1196-1567-1-SM.pdf

Khan, J. (2016). Impact of information communication technology on library and its services. *International Journal of Research-Granthaalayah*, *4*(9), 97–100. Retrieved from http://granthaalayah.com/Articles/Vol4Iss9/11_IJRG16_C09_114.pdf

Khan, S. A., & Bhatti, R. (2012). Application of social media in marketing of library and information services: A case study from Pakistan. *Webology, 9*(1), 1-8. Retrieved on 01st January, 2018 from http://www.webcitation.org/6fLKoMowZ

Krubu, D., & Osawaru, K. (2010). *The impact of information and communication technology (ICT) in Nigerian university libraries*. Retrieved on 6th April, 2018 from https://digitalcommons.unl.edu/cgi/viewcontent.cgi?referer=https://www.google.com/&httpsredir

Kumar, A. (2014). Marketing of information products & services in Kurukshetra University Library in the disciplines of social science: A study. *IOSR Journal of Humanities and Social Science (IOSR-JHSS), 19*, 72-85. Retrieved on 30th December, 2017 from https://s3.amazonaws.com/academia.edu.documents/34090632/L019217285.pdf

Lafeber, M. M., & Saunders, L. D. (2008). *Copyright protection in the digital age: Google book settlement and beyond.* Retrieved on 4th April, 2018 from https://apps.americanbar.org/litigation/committees/intellectual/roundtables/1108

Madhusudhan, M. (2008). Marketing of library and information services and products in university libraries: A case study of Goa University Library. *Library Philosophy and Practice (e-journal)*, *175*. Retrieved on 14th February, 2018 from http://digitalcommons.unl.edu/libphilprac/175

Mitra, M. (2016). Promoting library services in the digital era among the children and young adults. *The International Federation of Library Association and Institutions (IFLA).* Retrieved on 7th January, 2018 from https://www.ifla.org/node/10518

Mohseni, S. (2017). *Marketing plan for Kajaani University of Applied Sciences Library*. Retrieved on 16th May, 2018 from http://www.theseus.fi/bitstream/handle/10024/123133/Marketing+Plan+for+Kajaani

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

Nasir, R., Ponnusamy, V., & Lee, K. M. (2007). *Copyright protection in the digital era: A Malaysian perspective.* Retrieved on 23rd March, 2018 from https://mpra.ub.uni-muenchen.de/8253/1/MPRA_paper_8253.pdf

Odine, R. O. (2011). *Marketing library and information services in academic libraries in Niger State* (Master's dissertation). University of Nigeria, Nsukka. Retrieved on 25th March, 2018 from http://www.unn.edu.ng/publications/files/images/Rita%20Project%20(2).pdf

Okon, M. E., & Umoh, M. O. (2014). Marketing of information and library services in Nigerian university libraries: the way forward. *Information and Knowledge Management*, *4*(6). Retrieved on 05th January, 2018 from https://s3.amazonaws.com/academia.edu.documents/34229361/Marketing

Omosor, U. A. (2014). Effect of technology on librarians in academic libraries in Nigeria. *Information Impact: Journal of Information and Knowledge Management, 5*(2), 203-212. Retrieved on 20th April, 2018 from https://www.ajol.info/index.php/iijikm/article/view/144661/134312

Palfrey, J., Gasser, U., Simun, M., & Barnes, R. (2009). *Youth, creativity, and copyright in the digital age*. Retrieved on 23rd March, 2018 from https://dash.harvard.edu/handle/1/3128762

Patange, J. T. (2013). Marketing of library and information products and services. *Global Journal of Human Social Science Linguistics & Education, 13*(1). Retrieved on 20th February, 2018 from https://socialscienceresearch.org/index.php/GJHSS/article/view/561

Patil, S. K., & Pradhan, P. (2014). Library promotion practices and marketing of Library services: A role of Library professionals. *Procedia: Social and Behavioral Sciences*, *133*, 249–254. doi:10.1016/j.sbspro.2014.04.191

Ryan, B. (2013). *Optimizing academic library services in the digital milieu: Digital devices and their emerging trends*. Elsevier. Retrieved on 6th January, 2018 from https://books.google.co.za/books?id=nGZEAgAAQBAJ&pg=PA27&lpg=PA27&dq

Saxena, A., & Yadav, R. D. (2013). Impact of mobile technology on libraries: A descriptive study. *International Journal of Digital Library Services*, *3*(4), 1–13. Retrieved from http://www.ijodls.in/uploads/3/6/0/3/3603729/vol-3_issue-4_part-1.pdf

Schmidt, J. (2006). Marketing library and information services in Australian academic libraries. *Marketing Library and Information Services: International Perspectives*, 120. Retrieved on 01 January, 2018 from http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.214.7367&rep=rep1&type

Shear, B. (2010). *Copyright protection in the digital age*. Association of Corporate Counsel. Retrieved on 26th March, 2018 from http://www.acc.com/legalresources/quickcounsel/icpituscaeu.cfm?makepdf=1

Singh, R., & Shukla, A. (2009). Role of marketing strategy in academic libraries: A study. *International Conference of Academic Libraries (ICAL)*. Retrieved on 28th March, 2018 from http://crl.du.ac.in/ical09/papers/index_files/ical-108_103_233_2_RV.pdf

Tait, E., Martzoukou, K., & Reid, P. (2016). *Libraries for the future: The role of IT utilities in the transformation of academic libraries*. Retrieved on 7th January, 2018 from https://www.nature.com/articles/palcomms201670.pdf

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

Ukachi, N. B., Onuoha, U. D., & Nwachukwu, V. N. (2014). Students' attitudes as a determining factor to electronic information resources use in university libraries in South-West, Nigeria. *DESIDOC Journal of Library and Information Technology*, *34*(4), 333–341. doi:10.14429/djlit.34.6269

Yi, Z. (2016). Effective techniques for the promotion of library services and resources. *Information Research, 21*(1). Retrieved on 01st January, 2018 from http://InformationR.net/ir/21-1/paper702.html

KEY TERMS AND DEFINITIONS

Attitude: A perception, belief, feelings which emanate from personal experiences towards behavioral patterns accrued from observations, environments and cognitive domains. In library context, attitude determines personal behaviors.

Behavior: Repeated patterns of actions influenced by personal attitude, experiences, environments and cognitive aspects and it is built over a period of time.

Digital Contents: Refer to both electronic and digital information materials in text formats include books, journal articles, research reports, internet, databases, and eBooks presented in smartphone, tablets, desktops, laptops.

Digital Device: Physical units of digital equipment including smartphone, smart watch, tablets, desktops, laptops, and computers.

Perception: A set of people's beliefs, feelings and opinions about a phenomenon which normally influenced by environments, attitudes, previous experiences and cognitive domains. In this study context, perception is an understanding of sensations experienced which necessitate librarians to market library products and services.

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

Chapter 3
Artificial Intelligence, Cloud Librarianship, and Infopreneurship Initiatives for Inclusiveness

Joel O. Afolayan
Michael Imoudu National Institute for Labour Studies, Nigeria

Roseline O. Ogundokun
Landmark University, Nigeria

Abiola G. Afolabi
Michael Imoudu National Institute for Labour Studies, Nigeria

Adekanmi A. Adegun
Landmark University, Nigeria

ABSTRACT

Artificial intelligence (AI) is a broad and complex area of study, which can be difficult for non-specialists to understand. Yet, its ultimate promise is to create computer systems that manifest human intelligence. This chapter coins "Machinzation" for the application of literary machine (computer) to human operations. This clearly has major implications for library and information science profession. In principle and practice, AI has penetrated virtually all walks of human life. Many authors have previously provided in-depth overviews of AI technologies. Service is the vocal point of librarianship and particularly in the era where information is the fifth and most important factor of production. Cloud computing stems from the principle of AI while when applied into the operations and routines in libraries and information center gives a brand new concept "CloudLibrarianship." The new concept is dealt with in this work. Emergence of this concept opens up the entrepreneur opportunities in the information sector of the economy-inforpreneurship. This chapter therefore examines certain key aspects of AI that determine its potential utility as a tool for enhancing and supporting library operations.

DOI: 10.4018/978-1-5225-9034-7.ch003

Copyright © 2020, IGI Global. Copying or distributing in print or electronic forms without written permission of IGI Global is prohibited.

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

BACKGROUND

The chapter reviews the possible areas in which AI is applicable in librarianship, with a glimpse into areas like expert systems, intelligent computer-assisted instruction, and natural language applications. Also, the infopreneural opportunities are also highlighted for eventual adoption. Some of the barriers that inhibit the infopreneursip are not left out. It also gives facility to induce new applications quickly without having to focus on identifying available server space or configuration and information technology-based library services can be delivered much more quickly than when using local-based hardware or software.

INTRODUCTION

Immemorially, attempts to improve on both service and product related components of information management have witnessed reengineering and refocusing. As an interdisciplinary field, researches in librarianship have advanced so rapidly that the need to adopt computing is no mean option. Cloud computing is an emerging technology characterized by an element of novelty where the research community has recently embarked. Digitisation, automation and computing take over the revolutionary dynamics hence cloud computing has emerged to be an indispensable option for library and information profession. Invariably, computing is the product of artificial intelligence. Human intelligent components are naturally but sophisticatedly knitted. This is visible in their ability to acquire, sort and apply knowledge and skills in decision-making process. Successive revolutions in either the form of ideology or research have attempted to probe into possibility of '*machinizing'* human mental capacity. The '*machinization'* process gave bath to the development of computer which has transformed in size, processing capacity, and speed among others. Industrial revolution attempted to create machines that could replace man's physical power.

Industrialization has transformed the society totally and brought immediate crises in later development. In fact there are machines that can outperform human beings. Over the century man's working ability and thinking process have seen a sea of changes owing to the complimentary role of computing and '*machinization'* protocols. The changes have left no aspect of human endeavour out. The wave of changes is so strong that the human race and generations cannot recover from them hence unparalleled reference will be made to events that surrounded revolutions. Librarianship has had its own fair share of the unending impact of the revolution, particularly in the aspect of technology. A step further from elementary computing towards cloud computing is another giant stride that the service—focussed profession like Librarianship has greatly benefitted from. The society is becoming increasingly centered on information handling, processing, storage and dissemination, using microelectronic based technologies, today's computers can stimulate many human capabilities such as reading, grasping, calculating, speaking, remembering, comparing numbers, drawing, making judgments, and even interactive learning.

Researchers are working to expand these capabilities and, therefore the power of computers by developing hardware and software that can initiate intelligent human behaviour. The circle of information management is grossly incomplete until it attains the actionable form as illustrated in pyramid by Liebowitz (2003) and Aina (2013). It therefore implies that notwithstanding the level of advancement in 'information', such is still a raw material, always requiring further processing for decision-making. Furtherance to the reuse and subsequently, the processing of information particularly for economic gain gave rise to information-entrepreneurship, which has transformed into *infopreneurship*. This is the

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

understanding and keeping abreast of the developments in information, communication technologies, and their business, skills and systems in order to identify and access relevant sources of knowledge and understanding, target markets, pricing models and relevant customer network trends. In other words, *infopreneurship* is the profit-oriented enterprising with the exhaustive manipulation of, but well structured, information, at any level thereby enabling them to sell their expertise to the right clientele, by packaging, repackaging, marketing and distribution/circulation of knowledge as information-based products, services, and premium information broker.

ARTIFICIAL INTELLIGENCE

Intelligence has been variously defined. It cannot be pinned to a single definition. Gottfredson (1994) viewed Intelligence as a very general mental capability that, among other things, involves the ability to reason, plan, solve problems, think abstractly, comprehend complex ideas, learn quickly and learn from experience. It is not merely book learning, a narrow academic skill, or test-taking smarts. Rather, it reflects a broader and deeper capability for comprehending our surroundings, "catching on," "making sense" of things, or "figuring out" what to do. It is the ability to deal with cognitive complexity. Simply, it is the ability to learn, understand and think in a logical way about things and the ability to do this well. To understand "intelligent" systems, we must first attempt to understand the nature of intelligence. Theories of human intelligence abound, but there is no consensus about what constitutes intelligence. (Sternberg, 1987). This lack of a widely accepted definition of intelligence is an obstacle for Artificial Intelligence researchers. Based on a review of major models of human intelligence, Cook, Whittaker, Thieme, Smith, & Salvendy (1988) conclude that the following ten factors are most pertinent to expert system research:

1. **Acquisition**: The ability to acquire new knowledge.
2. **Automatization**: The ability to refine procedures for dealing with a novel situation into an efficient functional form.
3. **Comprehension**: The ability to know, understand, cognize and deal with novel problems.
4. **Memory Management**: The ability to represent knowledge in memory, to map knowledge on to that memory representation, and to access the knowledge in memory.
5. **Meta Control**: The ability to control various processes in intelligent behaviour.
6. **Numeric Ability**: The ability to perform arithmetic operations.
7. **Reasoning**: The ability to use problem-solving knowledge.
8. **Social Competence**: The ability to interact with and understand other people, machines, or programs.
9. **Verbal Perception**: The ability to recognize natural language.
10. **Visual Perception**: The ability to recognize visual images (cook et al).

Mijwel (2015) traced the history of Artificial intelligence thus: To be informed about the history of artificial intelligence, itis necessary to go back to previous dates in Milat. In the Ancient Greek era, it is proven that various ideas about humanoid robots have been carried out. An example of this is Daedelus, who is said to have ruled the mythology of the wind, to try to create artificial humans. Modern artificial intelligence has begun to be seen in history with the aim of defining philosophers' system of human thought. 1884 is very important for artificial intelligence. Charles Babbage, on this date, has worked

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

on a mechanical machine that will exhibit intelligent behaviour. However, as a result of these studies, he decided that he would not be able to produce a machine that would exhibit as intelligent behaviours as a human being, and he took his work suspended. In 1950,Claude Shannon introduced the idea that computers could play chess. Work on artificial intelligence continued slowly until the early 1960s.He added that the emergence of artificial intelligence officially in history dates back to 1956. In 1956, a conference artificial intelligence session at Dartmouth College was introduced for the first time. Marvin Minsky stated in his book "Stormed Search for Artificial Intelligence" that "the problem of artificial intelligence modelling within a generation will be solved". The first artificial intelligence applications were introduced during this period. These applications are based on logic theorems and chess game. The programs developed during this period were distinguished from the geometric forms used in the intelligence tests; which has led to the idea that intelligent computers can be created.

In 1950, Alan Turing created a test to determine whether a machine was intelligent. This test shows the intelligence given to computers. The intelligence level of the machines that passed the test at that time was considered adequate. List Processing Language (LISP), developed by John McCarthy in 1957, is a functional programming language developed for artificial intelligence. One of the rather old and powerful programming languages, LISP is a language that allows you to create flexible programs that represent basic operations with list structure. Between 1965 and 1970,it could be called a '*darkperiod*' for artificial intelligence. The developments on artificial intelligence in this period are too few to be tested. The hasty and optimistic attitude due to the unrealistic expectations that have emerged has led to the idea that it will be easy to uncover the machines with intelligence. But this period was named as a dark period on behalf of artificial intelligence because it did not succeed with the idea of creating intelligent machines by simply uploading data. Between 1970 and1975, artificial intelligence gained momentum. Thanks to the success achieved in artificial intelligence systems that have been developed and developed on subjects such as disease diagnosis, the basis of today's artificial intelligence has been established. During the period 1975-1980 they developed the idea that they could benefit artificial intelligence through other branches of science such as psychology.

Artificial Intelligence began to be used in large projects with practical applications in the 1980s. The next time the day light is passed, the artificial intelligence has been adapted to solve real life problems. Even when the needs of users are already met with traditional methods, the use of artificial intelligence has reached to a much wider range thanks to more economical software and tools. Artificial Intelligence has come a long way from its early roots, driven by dedicated researchers. The expression "artificial intelligence" was introduced as a 'digital' replacement for the analog 'cybernetics'. Artificial intelligence began as an experimental field with pioneers like George Boole (1815-1864), Allen Newell & Herbert Simon, who founded the first artificial intelligence laboratory (Kumar,2004) as well as Alan Mathison Turing. The earliest substantial work in the field of artificial intelligence was done in the mid-20th century by the British logician and computer pioneer Alan Mathison Turing. In 1935 Turing described an abstract computing machine consisting of a limitless memory and a scanner that moves back and forth through the memory, symbol by symbol, reading what it finds and writing further symbols.

The actions of the scanner are dictated by a program of instructions that also is stored in the memory in the form of symbols. This is Turing's stored-program concept, and implicit in it is the possibility of the machine operating on, and so modifying or improving, its own program (Britannica, 2018).In Pannu (2015) The Turing test was proposed Alan Turing (1950).This test was designed to test that whether a particular machine can think or not. The test involves a human interrogator who interacts with a human and with a machine and has to tell who is human and which one is machine. The computer passes the

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

test if an interrogator after posing some written questions, cannot tell whether the written response is coming from human or from the machine. It is therefore emphatic to note that Artificial Intelligence is not a neither a new concept nor new discipline, rather the frontier of knowledge in the discipline is been advanced for possible adoption by other field of human endeavour. Lots of researches probe into systems that have the ability to reason, to learn, to accumulate, to assess, to diffuse knowledge and to strive for self-improvement and to stimulate human sensory and mechanical capabilities. Experts are convinced that it is now only a matter of time; the present generation will experience the impact and utility of new applications in offices, factories, libraries and homes. The general area of research is known as Artificial Intelligence. Artificial intelligence is both the intelligence of machines and the branch of computer science which aims to create it, through "the study and design of intelligent agents" or "rational agents" (Goebel, Poole and Mackworth 1997), where an intelligent agent is a system that perceives its environment and takes actions which maximize its chances of success. According to Russell and Norvig (2003) the achievements in artificial intelligence include constrained and well-defined problems such as games, crossword-solving and optical character recognition and a few more general problems such as autonomous cars.

The emergence of a new field called 'Cybernetics' which has been coined and founded by Norbert Wisner brought together many parallels between human beings and machine. Cybernetics is the study of communication between human being and machine. In general Artificial Intelligence is the subfield of Computer Science concerned with understanding the nature of intelligence and constructing computer systems capable of intelligence action (Winston, 1999).It embodies the dual motives of furthering basic scientific understanding and making computers more sophisticated in the services of humanity. In other words Artificial Intelligence is the study of mental faculties through the use of computational models. In other words, it is the '*machinising'* or human reasoning. Artificial intelligence is the study and developments of intelligent machines and software that can reason, learn, gather knowledge, communicate, manipulate and perceive the objects. (Pannu, 2015). It is further argued that though artificial intelligence is different from psychology because it emphasis on computation and is different from computer science because of its emphasis on perception, reasoning and action. It makes machines smarter and more useful. It works with the help of artificial neurons (artificial neural network) and scientific theorems (if then statements and logics). Artificial intelligence, according to an Online Encyclopaedia Britannica, is the ability of a digital computer or computer-controlled robot to perform tasks commonly associated with intelligent beings. The term is frequently applied to the project of developing systems endowed with the intellectual processes characteristic of humans, such as the ability to reason, discover meaning, generalize, or learn from past experience. Artificial intelligence is the general name of the technology for the development of machines, which are created entirely by artificial means and can exhibit behaviours and behaviours like human beings, without taking advantage of any living organism. Artificial Intelligence (AI) encompasses the following general areas of research:

1. Automatic programming
2. Computer vision
3. Expert systems
4. Intelligent computer-assisted Instruction
5. Natural language processing
6. Planning and decision support
7. Robotics, and

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

8. Speech recognition (Mishkoff, 1988)

General intelligence or strong Artificial Intelligence has not yet been achieved and is a long-term goal of the research area. Among the traits that researchers hope machines will exhibit are reasoning, knowledge, planning, learning, communication, perception, and the ability to move and to manipulate objects. In the field of artificial intelligence there is no consensus on how closely the brain should be simulated. Artificial Intelligence's technologies have matured to the point in offering real practical benefits in many of their applications. Major Artificial Intelligence areas are Expert Systems, Natural Language Processing, Speech Understanding, Robotics and Sensory Systems, Computer Vision and Scene Recognition, Intelligent Computer-Aided Instruction, Neural Computing.

AREAS OF ARTIFICIAL INTELLIGENCE

Artificial Intelligence focuses on symbolic, non-algorithmic problem-solving methods. Intelligence relies on ability to manipulate symbols. Artificial Intelligence is not a young discipline but has a sudden surge when it is indispensably requiring sophistication in the handling of large volume of data and behavioural activities. Artificial intelligence has transformed the society beyond imagination. The goal of the Artificial Intelligence sub-areas like expert system, natural language processing, pattern recognition, and robotics as well as Speech Understanding, Semantic Information Processing (Computational Linguistics), Question Answering, Information Retrieval, Language Translation are to simulate human intelligence with computers. Some of the recent computational techniques and areas that are utilized in developing fields of Artificial Intelligence include but not limited to the following:

Expert System

Expert System are the knowledge-based computerized systems which play a role of intelligence interface or gateway for providing access to database and to obtain relevant information. They range in scale from simple rule-based systems with flat data to very large-scale integrated developments taking many person and years to develop. An expert system is a computer program that provides expert advice, decisions or recommended solutions for a given situation.an expert system is a computer system that emulates the decision-making ability of a human expert. Expert systems are designed to solve complex problems by reasoning through bodies of knowledge, represented mainly as if–then rules rather than through conventional procedural code. The first expert systems were created in the 1970s and then proliferated in the 1980s. Expert systems were among the first truly successful forms of artificial intelligence (AI) software. An expert system is divided into two subsystems: the inference engine and the knowledge base. The knowledge base represents facts and rules. The inference engine applies the rules to the known facts to deduce new facts. Inference engines can also include explanation and debugging abilities.

Natural Language Processing

Natural language processing is an area of computer science and artificial intelligence concerned with the interactions between computers and human (natural) languages, in particular how to program computers to process and analyze large amounts of natural language data. One of the long-standing goals of

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

computer science is to teach computers to understand the language we speak. The ultimate generation of computer language is the natural language. Artificial Intelligence scientists have succeeded in building Natural language interface to a large extent using limited vocabulary and syntax. Natural Language Processing allows a computer to understand the main linguistic concepts within a question or solution. Its goal is to design and build computer that analyze, understand and generate language that human use naturally.(Kumar,2004) The different components of natural language processing are, speech synthesis, speech recognition, machine translation, linguistic approaches, information retrieval and information extraction, Challenges in natural language processing frequently involve speech recognition, natural language understanding, and natural language generation

Pattern Recognition

Pattern recognition is a branch of machine learning that focuses on the recognition of patterns and regularities in data, although it is in some cases considered to be nearly synonymous with machine learning. Pattern recognition systems are in many cases trained from labelled "training" data (i.e. supervised learning), but when no labelled data are available other algorithms can be used to discover previously unknown patterns (i.e. unsupervised learning). It is the process of establishing a close match between some new stimulus and previously stored stimulus patterns. This process is being performed continually through the lives of all living things. Pattern recognition is studied in many fields, including psychology, ethology, cognitive science and computer science. Pattern recognition is based on either a prior knowledge or on statistical information extracted from the patterns. The patterns to be classified are usually groups of measurements or observations, defining points in an appropriate multi-dimensional space. The components of pattern recognition are; data acquisition, pre-processing, feature extraction, model selection and training, and evaluation. The terms: pattern recognition, machine learning, data mining and knowledge discovery in databases (KDD) are hard to separate, as they largely overlap in their scope. Machine learning is the common term for supervised learning methods and originates from artificial intelligence, whereas KDD and data mining have a larger focus on unsupervised methods and stronger connection to business use. Pattern recognition has its origins in engineering, and the term is popular in the context of computer vision:

Robotics

Robotics is an inter-disciplinary branch of engineering and science that includes mechanical engineering, electronics engineering, computer science, and others. Robotics deals with the design, construction, operation, and use of robots, as well as computer systems for their control, sensory feedback, and information processing. The field robotics is often described as the subfield of Artificial Intelligence that is concerned with perceptual and motor tasks. Robot is a mechanical device which performs automation tasks, either according to direct human supervision or a pre-defined program or a set of general guidelines, using artificial intelligence techniques. These technologies are used to develop machines that can 'substitute' for humans and replicate human actions. Robots can be used in any situation and for any purpose, but today many are used in dangerous environments (including bomb detection and deactivation), manufacturing processes, or where humans cannot survive. Robots can take on any form but some are made to resemble humans in appearance. This is said to help in the acceptance of a robot in certain replicative behaviours usually performed by people. Such robots attempt to replicate walking,

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

lifting, speech, cognition, and basically anything a human can do. Many of today's robots are inspired by nature, contributing to the field of bio-inspired robotics. Science-fiction author Isaac Asimov is often given credit for being the first person to use the term robotics in a short story composed in the 1940s. In the story, Asimov suggested three principles to guide the behaviour of robots and smart machines. Asimov's Three Laws of Robotics in Arumugaraja, Guga Priya &Soundarya (2014), as they are called, have survived to the present:

- **Law 1** (*Robots must never harm human beings*) A robot may not injure a human being or, through inaction, allow a human being to come to harm.
- **Law 2** (*Robots must follow instructions from humans without violating Law 1)* A robot must obey the orders given to it by human beings, except where such orders would conflict with the First Law.
- **Law 3** (*Robots must protect themselves without violating the other rules*) A robot must protect its own existence as long as such protection does not conflict with the First or Second Law

ARTIFICIAL INTELLIGENCE AND ITS APPLICATIONS IN LIBRARIES AND INFORMATION CENTRES

Computers provide the perfect medium for the experimentation and application of Artificial Intelligence technology in the present era. Artificial Intelligence has more success at intellectual tasks such as computer based game playing and theorem proving than perceptual tasks. Sometimes these computer programs are intended to stimulate human behaviour and they are built for technological applications also such as Computer-aided instruction (CAI).In many cases the main goal is to find any technique that does the task quick in the better way.

Application of Expert System in Library Activities

Library and information activities are service-oriented routines. Library personnel provide services to different people from different background, culture, feelings/emotions, skills, and characters hence the need to be vast in the art and science of service provision. (Afolayan, Ogundokun, Afolabi and Sadiku, 2018). The upward trend of technological application in all facets of human endeavour never left Library and Information Science profession behind. Library activities related to the information resources and materials, patrons and personnel (professional and non-professional alike). The application of expert systems, where dialogue between personnel & patrons and patrons& database appear quite promising, an expert system will help the librarian in realizing the need for an improvement in the productivity. A well programmed Expert System will also improve the quality.

Application of Expert Systems in Reference Service

Reference service is a prime activity of any library targeted at resolving the information seeking challenges of the clienteles, while the expert system will work as a substitute for a reference librarian. Following are some of the examples of expert systems used for reference service.

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

- **REFSEARCH**: A system that supplies patrons, the recommended sources to lookup for certain question. The system can be used to teach students reference skills or as a computerized aid for practicing reference librarians and information specialists.
- **POINTER**: Was the early successful working application of computer system in the area of reference work. It directs the users to the reference sources; it is not a knowledge-based system but a computer assisted reference program.
- **Online Reference Assistance** (ORA): This system intended to stimulate the services of a reference Librarian for questions of low and medium level, by using several technologies: a videotext like database, computer assisted instruction modules, and knowledge based system.An ORA consists of directional transactions like library locations, services, policies and guides.
- **ANSWERMAN**: A knowledge-based system to help users for reference questions on agriculture topics. It uses series of menus to narrow down the subject of the questions and the type of tools needed. It can function as either a consultation system or as a front end to external databases and CD-ROM reference tools.
- **PLEXUS**: A referral tool used in Public Libraries. It includes knowledge about the reference process, information retrieval about certain subject areas, reference sources, and Library users. All the above systems are advisory systems for locating reference source books and factual data.

Application of Expert System in Cataloguing

Cataloguing is one of the oldest library crafts which is responsible for the bibliographical description and listing of information bearing material to facilitate easy retrieval. Recent attempts to automate cataloguing through expert systems have focused on descriptive cataloguing because it is considered rule-basedi.e Anglo America Cataloguing Rule II (AACR2).There are two approaches for applying artificial intelligence techniques to cataloguing: A human-machine interface and an expert system. The human-machine interface is where the intellect effort is divided between the intermediary and the support system; while an expert system with full cataloguing capability linked into electronic publishing system, so that as a text is generated on-line, it can be passed through knowledge based systems and cataloguing process is done without any intellectual input from an intermediary. There have been problem in every attempt to convert AACR2 into the highly structured rules necessary to run the expert system.

Application of Expert System in Classification

Classification is the fundamental activity in the organization of knowledge. For this reason it is prominent in all systems for organizing knowledge in libraries and information centers. Application of expert system in the area of classifications in libraries includes the following:

- **Coal SORT**: A conceptual browser designed to serve either as a search or an indexing tool. Coal SORT consists primarily of a frame-based semantic network and the software needed to allow users to display portions of it and to move around in the conceptual structure. The expert knowledge in the system is embodied almost entirely in the semantic network. There is no procedural knowledge in the system.

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

- **Environmental Pollution Expert (EP-X)**: The Environmental Pollution Expert(EP-X) has certain things in common with Coal SORT in that both are concentrating on enhancing interface using a Knowledge Based approach. The knowledge base of EP-X consists of hierarchical frame-based semantic network of concepts and a set of template that express the patterns called the pragmatic relationship among concepts. These patterns are referred to as conceptual information.
- **BIOSIS**: BIOSIS uses a knowledge-base, including a significant amount of procedural knowledge, to assign documents to categories automatically. It is designed as an indexer aid. BIOSIS uses the information in the titles of biological documents to assign as many categories as possible of those that would be assigned by human indexers. The indexing languages are structured and practical representation of information that can be used to very good advantage of artificial intelligence applications.

Application of Expert System in Indexing

Indexing is one of the major activities which support the process of information organization of a collection of document data. It is an alphabetical list that is sometimes found at the back of a book indicating the page(s) where particular subject, people, place, events, keywords etc. Are referred to in the book. In other words, it is the process of creating the entries in an index. It is a service operation while an index is a tool. It is the necessary communication link between a source of information-the collection and those who could obtain some information from it (Olabisi, 2002). Indexing of periodicals is another area where expert systems are being developed. Indexing a periodical article involves identification of concepts, to translate these concepts into verbal descriptions, selecting and assigning controlled vocabulary terms that are conceptually equivalent to verbal descriptions. The reason for automating the intellectual aspects of indexing is to improve the indexing consistency and quality. Based on the information provided by the indexer, the systems can arrive at appropriate preferred terms automatically to assign relevant subdivisions. The system can make inferences and based on the inference, it can take appropriate action. '*MedIndex'* is the best example of indexing system used in the library Indexing activity. Very few library users have interacted with knowledge-based systems. In general, users have had very little contact with these systems due to the fact that most of them are not perfect enough to be used by the everyday library patron.

Application of Expert System in Acquisition

The collection of documents is another integral part of the library. The Librarian or the Information Officer is at the centre of this activity. The users of the library have a significant role to play in building library collections (electronic and physical alike) and that their needs (in form, volume and size) must be analysed and advice should be solicited in the process. Several systems have been incorporated. MonographSelection Advisor is a pioneering effort in applying this emerging technology in another area of Library and Information Management i.e. library collection development. Specifically, the task modelled is the item-by-item decision that a subject bibliographer makes in selecting monographic. The knowledge base has to be broad enough and the interfacing aspect must be easy enough for the library to get the desired information from the machine.

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

Applications of Natural Language Processing in Library Activities

When we think of the term Natural Language Processing (NLP), the first thought one might have is of being able to speak or write in a complete sentence and have a machine process the request and speak. NLP can be applied to many disciplines. To apply this to the field of Library and Information Science and more specifically to searching database such as online public access catalogue (OPAC). Indexing is the basis for document retrieval. The aim of indexing is to increase precision, the portion of the retrieved documents that are relevant; and recall, the proportion of relevant documents that are retrieved. Keywords, which have been weighted by the indexer as being basic to human thinking on a particular subject, will be fed into the electronic database in the way that will trigger the citing of an article or book on the computer screen, when these keywords are strung together in the proper sequence by the searcher. The main constraint is the variability in the ways a concept can be expressed. This variability is partly a matter of semantics, i.e., using the word 'mobile home' for 'trailers'. The word 'trailer' has been replaced by the word 'mobile home' in most parts of the country. Library patrons may not recognize the ambiguity of their search strategy. The use of natural language for Dialog database searches would allow the library patrons to search Dialog database directly, without the assistance of information professional. The *human* Librarian has the advantage of being trained in search and query as well as Natural Language and can act as an intermediary between the machine and the library patron. Some URLs are also case sensitive. In the future, it may be possible to use Natural Language to access the website also. Library patrons must become computer literate to take the advantage of this new technology.

Application of Pattern Recognition in Library Activities

In this era of the Internet, information distribution, data sharing, multimedia computing, new and emerging classes of information systems, applications have swept into the lives of office workers and everyday people. New applications ranging from digital libraries, multimedia systems, geographic information systems, and collaborative computing to electronic commerce have created tremendous opportunities for information researchers and practitioners. As the applications become more overwhelming, pressing and diverse, several well-known information retrieval problems have become even more urgent in this network-centric information age. The most fundamental technique in information retrieval involves identifying key features in objects. For example, automatic indexing and natural language processing are frequently used to automatically extract meaningful words. Texture, colour, or shape-based indexing and segmentation techniques are often used to identify images. For audio and video applications, voice recognition, speech recognition, and scene segmentation techniques can be used to identify meaningful description in audio and video stream. Several classes of techniques have been used for semantic analysis of texts or multimedia objects. Symbolic machine learning, graph-based clustering and classification, statistics-based multivariate analyses, artificial neural networks, and evolution-based programming are among the popular techniques.

In this information age, we believe these techniques will serve as good alternatives for processing, analyzing, and summarizing large amounts of diverse and rapidly changing multimedia information. The result from a semantic analysis process could be represented in the form of semantic networks, decisions, rules, or predicate logic. Spreading activation-based inference methods are often used to traverse various large-scale knowledge structures. One of the major trends in almost all emerging information systems applications is the focus on the real-time, provide a user-friendly, object-oriented interface to

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

powerful kinematics, dynamics calculations, and support various platforms, graphical, and seamless Human-Computer Interactions. The web-based browsers for texts, images, and videos have raised user expectation on the rendering and manipulation of information. Recent advances in the development languages and platforms such as Java, Open Graphics Library (OpenGL), and Virtual Reality Modelling Language (VRML) and the availability of advanced graphical workstations at affordable prices have also made information visualization a promising area for research.

Applications of Robotics in the Library Activities

Robot is an automatically controlled, reprogrammable, multi-purpose manipulator programmable in three or more axes, which may be either fixed in place or mobile for use in automation applications. The robots are on scrambling, rolling, flying, and climbing. They are figuring out how to get here on their own. As libraries provide a growing array of digital library services and resources, they continue to acquire large quantities of printed materials. This combined pressure of providing electronic and print-based resources and services has led to severe space constraints for many libraries, especially academic research libraries. Over the years, automation has slowly crept into libraries around the world. Digital databases replaced card catalogues, and some libraries use robots to file, sort and retrieve books for patrons. But most local libraries lack the space and resources for such complex systems. (Lewis, 2016) The goal of the Comprehensive Access to Printed Material (CAPM) is to build a robotic, on-demand and batch scanning system that will allow for real-time browsing of printed material through web interface. The user will engage the CAPM system that, in turn, will initiate a robot that will retrieve the requested item. The robot will deliver this item to another robotic system that will open the item and turn the pages automatically. By using existing scanners, optical character recognition (OCR) software, and indexing software developed by the Digital Knowledge Centre, the CAPM system will not only allow for browsing of images of text, but also for searching and analyzing of full-text generated from the images.

Promising Artificial Intelligence Tools and Techniques

Given the breadth and diversity of AI, there are a number of technological tools and techniques that may be valuable in constructing intelligent library systems. Some, such as neural networks are too immature to assess their usefulness. The following list briefly summarizes selected AI tools and techniques hold special promise. It is by no means a comprehensive list of potentially useful tools and techniques.

Blackboard and Cooperative Distributed Problem-Solving Systems

Blackboard architectures partition knowledge into separate knowledge sources that exchange information through a common data area, called a blackboard. These knowledge sources specialize in particular aspects of the problem to be solved. Under the control of a scheduling component, knowledge sources take turns working on specific aspects of a problem, and, in incremental steps, the problem is solved by their collective effort. Cooperative distributed problem-solving systems work in a similar fashion; however, each knowledge source is capable of more independent problem solving within its area of expertise, and it has more advanced communication and control capabilities. A metaphor is that knowledge sources in blackboard systems are like parts of the brain, while in cooperative distributed problem solving systems they are like human members of a team.

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

Frames

Typically, a frame represents a particular person, object, or event in the world. Since we normally view these things as occurring in groups with common stereotyped characteristics (e.g. patrons), frames are usually grouped into classes, with the frames in a particular class having a common structure. Each characteristic of the thing described by the frame is represented by a slot. Each slot normally contains a value, and this can be a default value. In addition to containing values, slots can contain procedural attachments, executable procedures that are invoked under specified circumstances. Frames of a particular class can be organized into a hierarchy, with lower-level frames inheriting the characteristics of their antecedents. Frames are particularly well-suited to representing knowledge in intelligent library systems.

User Models

A user model is simply a representation of an individual user or a class of users in an intelligent system. The system utilizes the knowledge contained in the user model to tailor its interactions to fit the specific needs of the user or class of users. There are numerous possible dimensions of user models, including:

- Class of users vs. individual user,
- Explicit description of the user by the system designer (or the user) vs. implicit deduction of the user's characteristics by the system,
- Short-term vs. long-term user characteristics, and
- Dynamic vs. static user characteristics.

User models as one of four knowledge base components of adaptive human-computer interfaces, with the other components being interaction, task/domain, and system knowledge. By creating intelligent library systems that employ user models and other adaptive human-computer interface components, developers can create systems that have more sophisticated interaction and knowledge-processing capabilities.

Intelligent Computer-Assisted Instruction

Intelligent Computer-Assisted Instruction (ICAI) systems can provide users with both education and training. CAI, the last generation of computer-based instruction tools, "requires teachers to fully specify presentation text, all questions and their associated answers, and a strict flow of control through the course, allowing at best different branches to be taken based on the students pre-enumerated possible responses. By contrast, ICAI systems can provide truly individualized instruction that is tailored to meet the user's specific needs. An ICAI system can contain domain, pedagogical, and user knowledge. Utilizing this knowledge, the system can identify the user's learning needs, diagnose the user's learning problems, and present appropriate instructional material. As the number of systems we utilize increases, the need to provide on-demand education and training to local and remote users also increases. ICAI can potentially address this need.

Given the current capabilities of affordable products in the AI marketplace, the implementation of systems utilizing blackboard, cooperative distributed problem solving, and ICAI techniques may require original programming. Fortunately, AI tools are becoming more powerful and cheaper as time goes on, and we can expect that less original programming will be needed in the future to provide sophisticated capabilities.

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

CLOUD LIBRARIANSHIP

Today Library environment s are largely dependent on computer technology. Many libraries of all sizes have discontinued manual routine approaches in favour of electronic. These electronic versions are accessible through terminals within and outside library buildings. In the networked environment, where information resources are in their soft copies and accessed via computer systems running on Local Area Network (LAN) and WideArea Network (WAN) with internet connectivity linked to a server, security of the information is a vital issue. The server in this case, the library's server, is feared to be vulnerable to environmental threats, unauthorised usage, malicious software and technical failures.

Library is an information infrastructure institution (In3). In other words, it is the organisation that is responsible for identification, selection, acquisition, procession, organizing, storage, provision and packaging of information bearing resources primarily to meeting the information need of a targeted user, meanwhile Librarianship is an interdisciplinary or multidisciplinary field that applies the practices, perspectives, and tools of management, information technology, education, and other areas to libraries; the collection, organization, preservation, and dissemination of information resources; and the political economy of information. The professional principle of Librarianship is exclusively capture in the five Laws of Raganantha thus:

1. Books are for use
2. Every Reader his book
3. Every book its reader
4. Save the time of the readers
5. Library is a growing organism

Some of the duties performed by librarians and information professionals include, but are in no way limited to, the following:

- Curate collections for every categories of users as may be defined by the policy of such library and information centre;
- Organize information for effective and efficient access and discovery;
- Build and manage information retrieval systems using user-centered design principles;
- Educate clientele (actual and potential alike) on the availability and applicability of information resources;
- Preserve cultural heritage as a extended information and archival services;
- Present and make accessible the various collections of information in the mist suitable format;
- Serve as social agency for its users that helps develop and sustain a long-standing productive relationship with information and knowledge;
- Study information needs and seeking behaviour to develop better services for various categories of its clientele;
- Consider the ethical and philosophical issues related to information, such as access and privacy;
- Manage and improve information environments; and
- Facilitate the creation and sharing of information and knowledge with the community of its users.

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

Cloud computing could be traced back to the days of mainframe computers when the concept of utility computing came to being where the computing power could be split into measured service like power and telephone supply. The great idea remained in history footage until it was put in application by *salesforce.com* which used a simple website to deliver its enterprise application to users. The history of cloud computing faced huge competition only when Amazon started its cloud-based Amazon web services (Cyberpassionteam, 2011). To keep pace with the technology, Microsoft in 2008 developed cloud based Azure services platform. Another feather in the cap was added by Google that developed Google Apps entirely based on architecture of cloud computing (Yuvaraj & Singh, 2012). Foster et al. (2008) compared and contrasted cloud computing with grid computing and inferred that "cloud computing is an evolved version of grid computing".

Cloud is a term used as a metaphor for the wide area networks (like internet) or any such large networked environment. It came partly from the cloud-like symbol used to represent the complexities of the networks in the schematic diagrams. It represents all the complexities of the network which may include everything from cables, routers, servers, data centers and all such other devices. Cloud computing has been variously defined by scholars, which include Gosavi, Shinde and Dhakulkar (2012) viewed it as an emerging computer paradigm where data and services reside in massively scalable data centres in the cloud and can be accessed from any connected devices over the internet. Cloud computing is a way of providing various services on virtual machines allocated on top of a large physical machine pool which resides in the cloud. Cloud computing comes into focus only when we think about what information technology has always wanted a way to increase capacity or add different capabilities to the current setting on the fly without investing in new infrastructure, training new personnel or licensing new software.

The core concept of cloud computing is, quite simply, that the vast computing resources that we need will reside somewhere in the 'cloud' of computers which can be connected to for use as and when needed. Computing can be described as any activity of using and developing computer hardware and software. It includes everything that sits in the bottom layer, i.e. everything from raw compute power to storage capabilities. Cloud computing ties together all these entities and delivers them as a single integrated entity under its own sophisticated management.

Characteristics of Cloud Computing

Self-Healing

Any application or any service running in a cloud computing environment has the property of self-healing. In case of failure of the application, there is always a hot backup of the application ready to take over without disruption. There are multiple copies of the same application - each copy updating itself regularly so that at times of failure there is at least one copy of the application which can take over without even the slightest change in its running state.

Multi-Tenancy

With cloud computing, any application supports multi-tenancy - that is multiple tenants at the same instant of time. The system allows several customers to share the infrastructure allotted to them without any of them being aware of the sharing. This is done by *virtualizing* the servers on the available machine

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

pool and then allotting the servers to multiple users. This is done in such a way that the privacy of the users or the security of their data is not compromised.

Linearly Scalable

Cloud computing services are linearly scalable. The system is able to break down the workloads into pieces and service it across the infrastructure. An exact idea of linear scalability can be obtained from the fact that if one server is able to process say 1000 transactions per second, then two servers can process 2000 transactions per second.

Service-Oriented

Cloud computing systems are all service oriented. This means that the systems are such that they are created out of other discrete services. Many such discrete services which are independent of each other are combined together to form this service. This allows re-use of the different services that are available and that are being created. Using the services that were just created, other such services can be created.

Service Level Agreement (SLA) Driven

Usually businesses have agreements on the amount of services. Scalability and availability issues cause clients to break these agreements. But cloud computing services are SLA driven such that when the system experiences peaks of load, it will automatically adjust itself so as to comply with the service-level agreements. The services will create additional instances of the applications on more servers so that the load can be easily managed.

Virtualized

The applications in cloud computing are fully decoupled from the underlying hardware. The cloud computing environment is a fully virtualized environment which means that deficiency in the functionality of any connected hardware will absolutely have not effect on the content of the stored resources.

Flexible

Another feature of the cloud computing services is that they are flexible. They can be used to serve a large variety of workload types - varying from small loads of a small consumer application to very heavy loads of a commercial application (Gosavi, Shinde & Dhakulkar, 2012).

According to the National Institute of Standards and Technology (2011) other characteristics are:

On-Demand Self-Service

A consumer can unilaterally provision computing capabilities, such as server time and network storage, as needed automatically without requiring human interaction with eacj service provider.

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

Broad Network Access

Capabilities are available over the network and accessed through standard mechanisms that promote use by heterogeneous thin or thick client platforms (e.g. mobile phones, tablets, laptops and workstations)

Resource Pooling

The providers' computing resources are pooled to serve multiple consumers using a multi-tenant model with different physical and virtual resources dynamically assigned and reassigned according to consumer demand. There is a sense of location independent in that the consumer generally has no control or knowledge over the exact location of the provided resources but may be able to specify locationat a higher level of abstraction (e.g. country, state or datacentre). Examples of resources include storage, processing, memory and network bandwidth.

Rapid Elasticity

Capabilities can be elastically provisioned and released. In some cases automatically, to scale rapidly, outward and inward commensurate with demand. To the consumers, the capabilities available for provisioning often appear in the unlimited and can be appropriated in any quantity at any time.

Measured Service

Cloud systems automatically control and optimise resources use by leveraging a metering capability at some level of abstraction appropriate to the type of service (e.g. storage, processing, bandwidth and active user accounts). Resource usage can be monitored, controlled and reported, providing transparency for the provider and the consumers.

Advantages of Cloud Computing in Libraries

1. Cost saving
2. Flexibility and innovation
3. User centric
4. Openness
5. Transparency
6. Interoperability
7. Representation
8. Availability anytime anywhere
9. Connect and Converse
10. Create and collaborate

Cloud Librarianship is an inter-operational term that combines 'Cloud computing' with 'Librarianship'. Being an emerging term, cloud librarianship can be viewed as an exclusive deployment of all tools, principles and mechanisms of emerging computer paradigm where information resources and routines reside in massively scalable data centres in the cloud towards driving the service provision in library and

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

information centres, which is accessible from any connected devices over the internet. In other words, it is the development that put the acquisition, organisation, availability and accessibility of information, as a product, services or both, at the heart of virtual machines allocated on top of a large physical machine pool which resides in the cloud. The application of 'cloud' in the operation of library and information services delivery is so enormous that its effect cannot be compromised for any reason.

Adoption of Cloud Computing in Libraries

Library and information centres are constantly in search of low-cost solutions due to low funding. Ironically, with the involvement of information technology, the commitment as well as services has been miserably infested. Under such conditions, cloud computing is the saviour of all the ebbs of the information technology. Buschman and Leckie (2009) posit that "librarians need to be critical in their use of technology". Vaquero, Rodero-Merino, Caceres and Lindner (2009) opines that Cloud computing and web collaboration are two major concepts that underlie new and innovative developments in library automation. Cloud services allow for more optimal resource utilization, easier access, and more effective cost reduction. From the emergence of World Wide Web (*www*), library and information science scholars has remodelled the future for libraries, recognizing that future libraries may not own their collection of resources. Instead, scholastic predictions indicated that the library in serving future users may offer referral service to potentially appropriate points in a vast network of resources accessible through the internet or its successors. These predictions have to come true. The web has also expanded the scope of services provided by librarians. The growing internet usage among library users and potential users, plus the time these users spend on the internet, has made it imperative that libraries offer their services online. Today`s consumers of information have more alternative and attractive ways of finding information than using the traditional library.

Today, the library`s users are accessing the information needed in the comfort and security of their homes or in their own personal or customized spaces. To meet their needs, libraries need to adopt the communication and information tools and services that users are accustomed to. Much of these tools and services will not be owned by the library but are necessary to carry out the enduring work of making library collections and services known and accessible to users. The introduction of the internet to libraries was part of a significant shift from print/in-house-focused services to online/ externally provided services. According to Mitchell (2010)historically, libraries have turned to huge capital investment on information technology infrastructure for various online as well as subscription based services. With these success libraries are motivated for using subscription based cloud infrastructure.

Cloud computing is important in the context of Library and Information Science (LIS) education for two reasons Tomer and Alman (2011) First, the embrace of cloud computing by many organizations, including OCLC, OhioLink, SirsiDynix, and the Library of congress suggests that this mode of computing will have a significant impact on the configuration, the economics, and perhaps the personnel requirements of library computing in years to come. The future of computing lies in cloud computing, whose major goal is reducing the cost of information technology services while increasing processing throughput, reliability, availability and flexibility and decreasing processing time. Recently, OCLC started Web-scale management services which can perform the in-house library operations through mutual co-operation. It will provide all its web-scale subscribers with a vendor database which will list their details avoiding data redundancy in libraries.

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

Libraries can work cooperatively in a flexible environment where they can share solutions to problems instead of having to reinvent the wheel at each library. Migrating to a cloud-based application may turn out to be cost neutral but at the same time still have the benefit of allowing staff to concentrate on library-specific issues (Moulasion and Corrado, 2011). Other vendors can take advantage of the cloud. Vendors can provide a remotely hosted service which allows for the creation of modular content, which many libraries would not be able to create on their own. It also lowers the technical skills needed to create web pages. Like other cloud applications it is accessible from any internet connection, so you do not need a client on your local personal computer. Moreover, through cloud computing instead of having own servers and employing personnel for its maintenance, libraries can hire a vendor on a monthly charge and enjoy the benefit of same server function. There seems to be an utmost use of web based services in libraries and information centres since the evolution of internet. They have also emerged as key players in the provision of internet services to the user communities (Kinney, 2010). During this time libraries have re-directed services both to support in-house internet use and to serve the needs of users via digital means (Blowers,2010). Now the information formats have also changed. Smartphones are being used by the users these days for accessing information services for fast and easy communication. Moore (2010) asserts that the use analysis now requires a cloud computing orientation".

INFOPRENEURSHIP

The word '*Infopreneurship'* is derived from the combined words 'information' and 'entrepreneurship'. Entrepreneurship is the totality of the activities that lead to taking the risk in mobilizing the production factors (natural resources, human resources and capital) in specific combinations to produce products and services for his or her community. Kuratko (2005) noted that entrepreneurship is more than the mere creation of business, as it is a dynamic process of vision, change, and creation which requires an application of energy and passion towards the creation and implementation of new ideas and creative solutions. An entrepreneur is an individual that undertake this task. Usually, the term is referred to any person whose primary business is gathering and selling electronic information. However, the practice is an emerging business model in mainstream information practice that is profit oriented in nature, based on a vision and passion for using the internet medium to create and or develop, package and sell information products and services for the purpose of generating income. (El-Kalash, Mohammed2 and Aniki, 2016)

Infopreneurial Competencies

According to Jain (1998) in Batthini (2012)A Library and Information Science professional who interested in starting a venture in library and information science field should possess the following infopreneurial competencies which are a combination of knowledge, skills and appropriate motives or traits that an individual should possess to perform a given task

1. Initiative
2. Opportunity Seeking
3. Persistence
4. Information Seeking
5. Concern for High Quality of Work

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

6. Commitment to Work Contract
7. Efficiency Orientation
8. Systematic Planning
9. Problem Solving
10. Self-Confidence
11. Assertiveness
12. Persuasion
13. Use of Influence Strategies

These soft skills shall underlie characteristics of a person which result in effective and superior performance of a job. Competencies may be hard and soft, but they can be seen in successful infopreneurs. These competencies can be developed through proper training interventions.

Areas of Infopreneurship

Areas of infopreneurship refer to projects that one may undertake if one decides to pursue infopreneurship. The following are some of the identified areas of infopreneur:

1. Research (exploratory and evaluative) in information and related fields such as user studies and market analysis
2. Compilation of bibliographic lists
3. Provision of current business information
4. Compilation of directories
5. Publishing
6. Translation services
7. Information repackaging
8. Writing, editing and proof reading
9. Collection management
10. Records management
11. Cataloguing

There are more areas of infopreneurship that can be identified today such as Internet providers, e-services, and m-services. Sale of e-books and e-publishing, business analyst consultants, web newsletters, access achieved through subscription, and online solutions through recorded videos, for example on how to reference, how to publish online, how to write a winning research proposal, or what career options there are in the field of Library and Information Science. Further avenues would include information intermediaries operating via chartrooms or offering online conferences through networking services such as *Facebook* and *skype*.

1. Book Publishing Industry
2. Book Distribution Agency
3. Periodical Subscription Agency
4. Newspaper Dealership
5. Book Shop

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

6. Stationary Shop
7. Binding Workshop
8. Lending Library
9. Reading Room
10. Consultancy Services
11. Career Counsellor
12. Library Software Developing Industry
13. Online Bookstore
14. Digital Book/Periodical Publishing
15. Subscription Agency of Electronic Book/Journals
16. Writing Biographies (*Ibid*)

El-Kalash*et al* (2016) identified the following

- Automation of records management systems
- Content analysis and development
- Data services like database development and support and data analysis.
- Freelance teaching
- Freelance writing
- Graphic designing
- Knowledge management consultancy
- Marketing of information products
- Organization of knowledge
- Paid blogging services
- Project publishing consultancy
- Records classification and Indexing
- Records surveying
- Registry systems analysis and design, etc.
- Web design services

Weitzen (1998) Identified six ways in which infopreneurs generate, organise and disseminate information profitably

1. **Leveraged information:** Infopreneurs make use of databases or the internet to obtain general market information and support data for research, as well as for the creation of marketing plans, pricing strategies, distribution channels and advertising programmes.
2. **Customised information:** Information that is synthesised and tailored to the user's needs. This included the manipulation of information into a format that is easily understandable (e.g. computer generated graphics).
3. **Facilitating Access to information:** The information explosion of the last few years increased the need to find the right information in a timely manner. The gap between information produced and information consumed continues to widen, because of the rapid developments taking place today. One solution to this problem is electronic access to information, because this allows infopreneurs

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

to access desired information; select what is valuable, finally reconstruct and disseminate information selectively to clients.

4. **Speeding up the flow of information:** The time-sensitive nature of information requirements ensures a high demand for the speeding up of the flow of information. Today infopreneurs are capable of generating, sending and receiving data virtually instantaneously via the World Wide Web, from and to remote locations thousands of kilometres away.
5. **Repackaging information:** The process of repackaging information includes the organising of information into new information products and services. The goal of repackaging information is to locate unrelated and yet possibly relatable information and create new products combining the information.
6. **Around the clock delivery of information**: As computers begin to substitute human effort, it becomes possible to deliver information instantly at any time of day or night. This process causes information to take on a value-added quality.

Impediments to Infopreneurship

Ibegwam (2004) classified the impediments to the entrepreneurship into two; external and internal constrained which could be adapted to the inforpreneurship.

- *External Constraints*
  - Finance
  - Inadequate infrastructural facilities
  - Competition from large firms
  - Unfavourable government policies
  - Death of machines and spare parts
  - Paucity of raw materials and limited knowledge of Area of Enterprise
  - Group and Family Influence
  - Technological Problems
  - Gender Impediments
  - Educational and Social factors
  - Legal and Regulatory Framework
  - Lack of Information and Networks
- *Internal Constraints*
  - Fear Factor
  - Thinking Small
  - Short Term Thinking
  - Not ready for Competition
  - Certain Cultural Beliefs'
  - Focus on Niche/Small Markets
  - Extravagance and Over Spending

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

CONCLUSION

Cloud computing is a novel concept where theory building is not at the centre of research rather most studies focus on praxis. The technology has been explored at its utmost from technical purview and its implication in library is yet to be explored due to its relative edge in libraries. It is of prime importance for the reinvigoration of the library profession. Libraries are in a unique position to experiment with cloud computing given their service oriented mission and need to find appropriate solutions using limited resources. The goals of the organization have an impact on their use of cloud solutions. "There is a tremendous amount of enthusiasm around cloud-based solutions and services (filtering, sorting, categorization and analytics) to help users manage the vast repositories of both structured and unstructured information, as well as the cost-savings and flexibility that they can provide. It is imperative that all senior technologists have a solid understanding of the ramifications of cloud computing since its impact is likely to permeate the entire IT landscape. As such cloud computing, which stem from artificial intelligence, is the seeds for reinvigoration of library and information science professions gave birth to another concept *'Cloud Librarianship'*, has been discussed as a new technology develop that can provide several advantages, strategic, operational and economic, to its adopters, the cloud computing adoption rate is not growing as fast as expected. By using cloud, library services can be made online without worrying about correct versions of platforms or the underlying technology, hence expanding the scope of infopreneurial opportunities for inclusiveness.

REFERENCES

Afolayan, J. O., Ogundokun, R. O., Afolabi, A. G., & Sadiku, P. O. (2018). Emotional Intelligence, Effective Leadership and Organizational Productivity: Social Constructivism Theory Synthesis. In *Emotional Intelligence and Leadership in Nigeria Library and Information Science*. Offa.

Aina, L. O. (2013). *Information, Knowledge and the Gatekeeper*. The One Hundred and Thirty-Second Inaugural Lecture delivered at the University of Ilorin.

Arumugaraja, M., GugaPriya, B., & Soundarya, M. (2014). The Library Management Robot. *International Journal Of Engineering And Computer Science*, *3*(3), 5008–5012.

Blowers, H. (2010). From Realities to Values: A Strategy for Digital Natives. *Computers in Libraries*, *30*(4), 6–10.

Cook, J., Whittaker, A. D., Thieme, R. H., Smith, O. R., & Salvendy, G. (1988). Human Intelligence Models and Their Implications for Expert System Structure and Research. *Behaviour & Information Technology*, (7): 424–425.

Cyberpassionteam. (2011). *History of cloud computing*. Retrieved from: http://yourravi.com/history-of-cloud-computing/

El-Kalash, K. I., Mohammed, S. B., & Aniki, M. Y. (2016). Exploring Infopreneurship for Economic Growth andSustainability in a Developing Economy: The Nigeria Perspective. *Journal of Educational Policy and Entrepreneurial Research*, *7*(3), 240–249.

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

Foster, I., Zhao, Y., Raicu, I., & Lu, S. (2008). Cloud Computing and Grid Computing 360 Degree Compared. *Grid Computing Workshop (GCE'08)*, 1-10. 10.1109/GCE.2008.4738445

Ganapathi. (2012). *Entrepreneurial Opportunities for Library and Information Science Professionals.* Paper presented at MANLIBNET's International Conference on Creating Wisdom and Knowledge through Shared Learning: Role of Librarians and Information Managers, IIM, Indore. Available at http://ssrn.com/abstract=2468738

Goebel, R., Poole, D. L., & Mackworth, A. K. (1997). *Computational Intelligence: A Logical Approach*. Oxford, UK: Oxford University Press.

Gosavi, N., Shinde, S. S., & Dhakulkar, B. (2012). Use of Cloud Computing in Library and Information Science Field. *International Journal of Digital Library Services*, *2*(3).

Gottfredson, L. S. (1994). Mainstream Science on Intelligence. *Intelligence*, *24*(1), 13–23. doi:10.1016/S0160-2896(97)90011-8

Ibegwam, A. (2014). Entrepreneurship Constraints and the Way Forward: A Case for Prospective Entrepreneurs in the Library and Information Profession. In Entrepreneurship Studies and Practices in Library and Information Science. Lagos: Zeh Communications.

Kinney, B. (2010). The Internet, Public Libraries, and the Digital Divide. *Public Library Quarterly*, *29*(2), 104–161. doi:10.1080/01616841003779718

Kumar, P. S. G. (2004). *Information Technology: Applications*. New Delhi: BRPC.

Kuratko, D. F. (2005). The Emergence of Entrepreneurship Education: Development, Trends, and Challenges. *European Journal of Business and Management*, *6*(6), 38–42.

Lewis, D. (2016). *This Robot Librarian Locates Haphazardly Placed Books: It's the Next Best Thing since the Dewey Decimal System*. Accessed on July 24, 2018 at https://www.smithsonianmag.com/smart-news/robot-librarian-locates-haphazardly-placed-books-180959381/#gXxorjSCWdLgxZiG.99

Liebowitz, J. (2003). Relations between Data, Information, Knowledge and Wisdom. In *Basic Knowledge Concepts - Data, Information, Knowledge and Wisdom*. Trainmore Know-How Handbook and Portal. Available at: http://www.trainmorknowmore.eu/FBC5DDB3.en.aspx

Mijwel, M. M. (2015). *History of Artificial Intelligence*. Available on http;//www.researchgate.net/publication/322234922

Mishkoff, H. C. (1988). *Understanding Artificial Intelligence* (2nd ed.). Indianapolis, IN: Howard W. Sams& Company.

Mitchell, E. (2010). What Cloud Computing Means for Librarie? In E. M. Corrado & H. L. Moulasion (Eds.), *Getting Started with Cloud Computing* (pp. 1–5). Facet.

Moore, G. (2010) *Atmosphere: Core, Content and the Cloud*. Youtube Video. Retrieved from: www.youtube.com/eventsatgoogle#p/u/8/0swJCYLH

Moulasion, H. L., & Corrado, E. M. (2011). Perspectives on cloud computing in libraries. In M. Edward (Ed.), *Corrado and Heather Lea Moulasion,Getting started with cloud computing* (pp. 3–11). Facet.

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

National Institute of Standards and Technology. (2011). 5 Essential Characteristics of Cloud Computing. In *Giving Meaning to Cloud Computing Jagon.* Author. Accessed on July 27, 2018 at www.inforisktoday.com/5-essential-characyeristics-cloud-computing-a-4189

Olabisi, A. (2002). *Information Sources in Science and Technology: A New Approach*. Ibadan: Moba Printing Press.

Pannu, A. (2015). Artificial Intelligence and its Application in Different Areas. *International Journal of Engineering and Innovative Technology,* (4), 10.

RamugondoLugisani S. (2010). *An Exploratory Study of Infopreneurship as a Job Option for Library and Information Science Students: A Literature Review*. Being presentation at the 11th DIS Annual Conference 2010, 2nd–3rd September, Richardsbay, University of Zululand, South Africa.

Russell, S. J., & Norvig, P. (2003). *Artificial Intelligence: A Modern Approach*. Englewood Cliffs, NJ: Prentice Hall.

Sternberg, R. J. (1987). Intelligence. In The Oxford Companion to the Mind. Oxford, UK: Oxford University Press.

Tomer, C., & Alman, S. W. (2011). Cloud Computing for LIS Education. In Getting Started with Cloud Computing. Facet.

Vaquero, L., Rodero-Merino, L., Caceres, J., & Lindner, M. (2009). A Break in the Clouds: Towards a Cloud Definition. *Computer Communication Review*, *39*(1), 50–55. doi:10.1145/1496091.1496100

Weitzen, H. S. (1998). *Infopreneurs: TurningDataintoDollars*. New York: John Wiley and Sons.

Wikipedia. (2018a). *Expert System*. Accessed on July 22, 2018 at https://en.wikipedia.org/wiki/Expert_system

Wikipedia. (2018b). *Natural Language Processing*. Accessed on July 22, 2018 at https://en.wikipedia.org/wiki/Natural_language_processing

Wikipedia. (2018c). *Pattern Recognition*. Accessed on July 22, 2018 at https://en.wikipedia.org/wiki/Pattern_recognition

Wikipedia. (2018d). *Robotics*. Accessed on July 22, 2018 at https://en.wikipedia.org/wiki/Robotics

Winston, P. H. (1999). *Artificial Intelligence*. New Delhi: Addison Wesley.

Yuvaraj, M., & Singh, A. P. (2012). Cloud Computing in Conjunction with Libraries: Descriptive Literature Review. *Asia Pacific Journal of Library and Information Science, 2*(2).

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

Chapter 4
Resource Sharing: Vehicle for Effective Library Information Dissemination and Services in The Digital Age

Adeyinka Tella
University of Ilorin, Nigeria

Femi Quardri
Federal Polytechnic, Nigeria

Sunday Segun Bamidele
Kwara State College of Education, Nigeria

Olubukola Oluyemisi Ajiboye
University of Ilorin, Nigeria

ABSTRACT

The chapter examined resource sharing as vehicle for effective library information dissemination and services in the digital age. In relation to this purpose, studies have shown that the global information explosion, the cut in library budgetary allocations, the rising costs and complexities of information resources, as well as the need to provide the user community with optimal access to needed information make resource sharing initiatives indispensable particularly among academic libraries for effective information dissemination and service delivery in the digital age. However, certain questions remain unanswered in the literature regarding resource sharing. They include: How can libraries engage in effective dissemination of information to the clientele through resource sharing? How can resource sharing result to effective service delivery in academic library? Is there a reflection of resource sharing in Nigeria? What is the nature of resource sharing in this digital age? What does the future hold regarding resource sharing in academic libraries and what are the issues/challenges associated with resource sharing by academic libraries in the digital age? It is expected that this chapter will provide answers to all these pertinent questions.

DOI: 10.4018/978-1-5225-9034-7.ch004

Copyright © 2020, IGI Global. Copying or distributing in print or electronic forms without written permission of IGI Global is prohibited.

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

INTRODUCTION

Consequent on the ongoing economic recession and the increasing cost of information resources, libraries irrespective of their types find it difficult to acquire all the documents and information materials necessary to be available in the library for the users. This implies that no library is capable of satisfying all the needs of its clientele. It is on this note that (Zulu, 2015) posited that no library is self-sufficient and the possibility and feasibility of any library irrespective of its size to be self-reliant in terms of collection is doubtful. Libraries in Nigeria are not exempted from this. To rescue themselves from this situation, libraries therefore have developed a way to improve their services to the users by widening the base of information availability through sharing of resources. Sharing of library resources which is an aspect of inter library cooperation means that one library uses the resources of their libraries and vice versa.

In the literature, a group of libraries working together in cooperation for common purpose of material benefit is termed resource sharing system. Resource sharing encompasses a wide range of physical, intellectual and conceptual resource on the one hand and a body of people with library and information needs on the other hand. The terms ‘’resource sharing’ ’library cooperation”, “library networking”, ‘’library linkages”, “library collaboration”, “library consortia”, “interlibrary loan”, “document supply”, “document delivery”, “access services”, are used interchangeably to describe formal and informal cooperation, partnership and resource sharing activities in libraries (Zulu, 2015, Chatterjee, 2016).

As put forward by Bucholz (2011), the digital revolution driven by Information Communication Technologies (ICTs), innovation has also transformed resource sharing among libraries fundamentally. These have impacted on every sphere of library activity for example the form of the library collection development strategies, library buildings and consortia. Computers and networked electronic resources have become an integral part of the library.

Resource sharing in academic libraries usually takes two forms. The first is collaborative collection development, whereby subject specializations are intended to be distributed among libraries within a clearly defined geographic region, so that individual libraries need not attempt to collect resources in all fields; but can concentrate on a particular field. The second form of resource sharing is through various document delivery mechanisms.

Libraries the world over are established to support their parent institutions in actualizing their objectives of teaching, learning and research in different formats. No library, not even the largest and most comprehensive can fulfill all its users’ needs. The largest shared system for library resource sharing is OCLC, which enables over 10 000 libraries in 56 countries to share millions of loans and copies annually. Every 18 seconds, a member library fills a request. More than 7000 libraries used the system in 2016, sharing physical material and more than one million electronically delivered articles (Posner, 2017). There is also an annual OCLC Resource Sharing Conference which focuses on best practices and staff development opportunities. Sharing any one system that automates and simplifies discovery, processing and delivery enables savings of both time and money.

Studies conducted by Okeagu and Okeagu (2008); Edem (2010); Omekwu (2006), Nwalo (2008), Urhiewhu et al. (2015) and Igu and Ojiegbe (2017) have shown that the global information explosion, the cut in library budgetary allocations, the rising costs and complexities of information resources as well as the need to provide the user community with optimal access to needed information make resource sharing initiatives indispensable particularly among academic libraries for effective information dissemination and service delivery in the digital age. However, certain questions remained unanswered in the literature

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

regarding resource sharing. They include: how can libraries engage in effective dissemination of information to the clientele through resource sharing?, how can resource sharing result to effective service delivery in academic library?, Is there a reflection of resource sharing in Nigeria?, what is the nature of resource sharing in this digital age?, what does the future hold regarding resource sharing in academic libraries and what are the issues/challenges associated with resource sharing by academic libraries in the digital age?. It is expected that this chapter will provide answers to all these pertinent questions.

RESOURCE SHARING: BACKGROUND

Library Cooperation/Resource sharing (RS) among libraries can be traced back to 200 B.C., when materials from the great Alexandria library were borrowed by the library of Pergamum. Libraries over the centuries practiced RS in the form of *inter library loan* either formally or informally. Planned library cooperation started in Germany around the year 1770 when G.H. Lessing, librarian in Wolfenbuttel formulated a plan for the exchange of duplicate materials between libraries (Dhiman & Rani, 2007). Technological advancements made a considerable impact on the concept and practice of RS.

The system of library cooperation as we see today began in the second half of the twentieth century with the establishment of Online Computer Library Centre (OCLC) in USA in 1967. The interest in RS rose among the libraries around the world in the following decades. Library cooperation in the 20th century was mainly concentrated on the compilation of union catalogs of holdings of participating libraries. With the infusion of information technology into libraries, the mode of cooperation took a new pace. In the 21st century, library cooperation took a diversified impetus in the form of cooperative content acquisition, catalog sharing, continuing education, cooperative digitization and storage, etc. The advances in internet technologies, the new forms and formats of digital documents and new modes of scholarly communication is now making a great impact on the RS activities of libraries around the globe. Resource sharing, which used to be a side business in the librarianship trade, is now becoming the flagship operation in the library projects (Jaswal, 2005, Esposito, 2015).

Resource Sharing as a Concept

Resource sharing is concerned with the sharing of library resources by certain participating libraries among themselves on the basis of the principle of cooperation. The term ‘resource’ represents three entities in a library i.e.: ‘man, material and money’. Resource sharing refers to the activities that result from a formal or informal agreement among a group of libraries (usually a consortium or network) to share collections, facilities, data, personnel, and so on for the benefit of their users and to reduce the expense of collection development. It includes inter-lending, document delivery and networking (Chen, 2013). Resource sharing, while seen in the context of librarianship, is an omnibus expression to cover cooperation, coordination, inter-library loans, cooperative acquisitions, cooperative storage and processing (Odini, 1991). Following this reasoning, it can be argued that information resources sharing is a wide phrase embracing information services cooperation, systems, and networking. This is in agreement with Odini’s (1991) assertion that resource sharing may be seen as a term for working out inter-institutional relationships for the benefit of users in a profession which is frequently described as changing from materials-oriented to client-oriented.

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

For resource sharing, the participating libraries need to come together and cooperate in two broad areas: (a) Developing the collection on shared basis, and (b) Developing services for exploiting such collection (Dhawan, 1999). Developing the shared resources is of great importance and central to the concept of resource sharing. In developing the shared resources, the focus is first on eliminating duplication in the acquisition of various participating libraries to the extent possible. Thereafter, the focus is on the selection of such publications, which the participating libraries agree to share, and later on their acquisitions. The efforts of participating libraries in developing the shared resources are, therefore, directed in two distinct directions: (a) Rationalisation, and (b) Acquisition. There are several limitations to the resource sharing in the print environment as it existed till recently: a) open access to shared resource not feasible; b) service depends upon library performance; c) access to shared resource at a cost.

In other words, from the literature, it is observed that resource sharing can be used interchangeably with library cooperation, library consortia, inter-library loan, library networking, document supply, document delivery, library cooperation, library linkages, library collaboration, access services, etc. The different conventional forms of RS being practiced worldwide are (Ashikuzzaman, 2015):

- Inter-Library Loan
- Cooperative Acquisition
- Cooperative Processing
- Cooperative Storage
- Union Catalogs
- Union Lists
- Document Delivery Service
- Exchange of Personnel and Training.

Figure 1 represents a typical resource sharing among libraries.

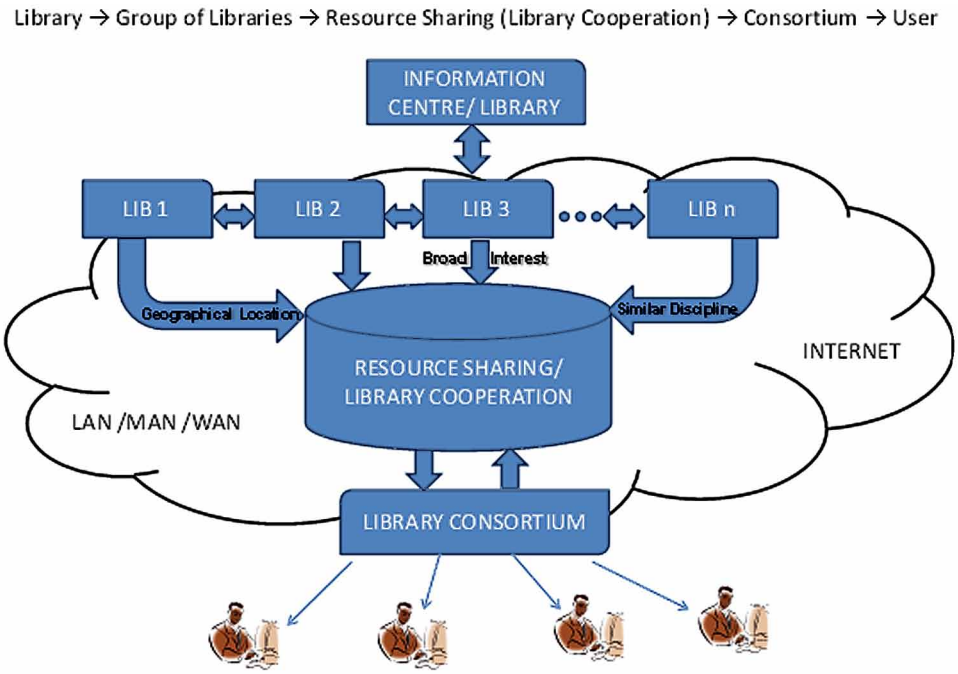
Areas of Resource Sharing and Cooperation Among Libraries

According Abdulrahaman, Awuhe and Ojobo (2015), networks arise because individual libraries realize that they can no longer be self sufficient in respect of their information resources. The underlying assumption of a library network is that all participating members will share their resources and use the network. Networking is a joint venture and needs the cooperation of everyone involved. The following are the areas through which participating libraries can cooperate:

1. **Cooperative Acquisition:** Under this arrangement, a particular library engaged in networking maybe assigned to acquire books for all the participating libraries, or each library in the scheme maybe given the responsibility to acquire books in a particular subject of interest to all the participating libraries, or the host computer acquire some necessary books for all the participating libraries. This process will not only save money and manpower which are limited, but also save time.
2. **Reference and Information Services:** Under resources sharing, member libraries could benefit from the following reference services:
    a. Selective dissemination of information (SDI)
    b. Indexing and abstracting services
    c. Current awareness services

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

Figure 1. Model of Resource sharing by libraries
Source: Bhavan and Narayan (2011)



3. **Development of an Inter-Library Loan or Document Delivery:** This arrangement facilitate the process in which materials are borrowed out by libraries in the scheme, it could be by both online like e-mail and or by transporting the materials to another library, this could be by post or courier. Whatever one opted for, the security and the safety of the materials is in the forefront.
4. **Technical Services:** Here, participating libraries will cooperate in cataloguing, which has to do with the method of centralized cataloguing of all the libraries holdings, with a view to reducing the cost of such activities of the individual libraries and above all for standardization of records and format to avoid disparity of entry.
5. **Interchange of Staff:** These involve the interchange of professionals and sometimes non-professional staff under specific arrangements worked out by cooperating libraries. This is aimed at providing specific training or broadening the experience of the staff concerned.

Importance of Resource Sharing

One of the objectives of resource sharing is to enable the cooperating libraries to save money, and at the same time improve the level of output, increase bibliography access of literature through internet and offline database on CDs. In many cases, the intent is to decrease budgets along with high cost of published output which has made it virtually impossible for libraries and documentation/information centers to fulfill information needs of their primary clientele.

Needs for information resources can be met through the mechanism of library cooperation in sharing of resources. The appreciation of the need for cooperation leads to the formation of library consortium.

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

To achieve this, first of all several libraries are required to come together for the mutual benefit of the respective user in the form of library cooperation. Secondly, libraries are linked together with the help of communication system in terms of networking. Libraries come together to acquire traditional and e-resources under the umbrella of library consortium (Chatterjee, 2007). It is observed that in resource sharing, libraries and their partners traditionally work together for "Selfish" but positive reasons. They do this to leverage shrinking budgets, to learn from each other; to build better tools together and most importantly, to serve their users better by taking advantage of one another's collections (Borek, 2006).

According to Islam (2012, p.6) resource sharing is very important among libraries because it could be used to fulfill the following major objectives:

1. facilitate collective acquisition and sharing of traditional and e-resources;
2. cooperate in processing of information resources;
3. access and download the required resources remotely by the users of the participating Libraries;
4. help develop a country-wide acquisition policy to avoid unnecessary and wasteful duplication in purchase;
5. develop a more sophisticated search engine enabling simultaneous search of multiple databases;
6. establish an electronic journal center to serve as a permanent archive for electronic journals;
7. provide extensive facilities to use full text databases and electronic journals;
8. develop digital resources jointly and to provide access to such materials to the members of the consortium; and,
9. establish reciprocal borrowing agreements among the participating libraries to share.

Similarly, Ashikuzzaman (2015) asserted that the goals of resource sharing should include among others:

- Facilitating users to have better access to library collection and services.
- Reduction in all round cost.
- Exchange of library resources and information to benefit users.
- Enabling the users to be more aware regarding the resources not available in their own library.
- Advocated support creative use of library information resources.
- Create positive effect on library budget in term of cost or more services at lesser cost than can be undertaken individually.
- Avoidance of unnecessary duplication of information resources and their processing and maintenance costs.
- Provision of greater access to information resources to a wider category of users.
- Development of specialised areas of collection building, each library concentrating on areas of its own concern.

Resource Sharing and Information Dissemination

Resource sharing allows a quick service delivery and provides the pinpointed and exhaustive information to the users when they are needed. Information dissemination is all about distribution of information to the users. This information could be of any type and its subtypes. According to Rutledge International

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

Encyclopedia of Information and Library Science, "active distribution and the spreading of information of all kinds are called dissemination of information (Rutledge, 1997) in Tella (2018).

The basic objective of information dissemination is to pass to the users all the latest information exclusively matching with their requirements and this service is to take place at regular and fixed intervals (Tella, 2018). The evaluation criteria should match the satisfaction of the users. The feedback from the user gives the opportunity to improve and have control over the accuracy. The profiles of users' interest or the target group stored in a computer generated system with its update and their profiles are further matched with the resources available through the libraries and information centres. It should be noted that dissemination of information to the satisfaction of the users might be difficult in the absence of resource sharing. This is because most libraries do not posses all the necessary collections to meet all the information needs and demands of the users particularly in this recession period. This shows the indispensability of resource sharing among academic libraries. Through resource sharing, cooperating libraries can make request from their member libraries on information requested by the users which is not available in their own library. This is made easy in this digital era in the presence of electronic dissemination of information, sharing of electronic databases, electronic resources and even human resources.

Resource Sharing and Service Delivery

User services are critical to the resource-sharing programme for its performance and effectiveness in providing access to shared resources. Academic libraries that are required to organise and provide the user services are not always fully equipped to meet such obligations. However, modern information technology has made the task of resource sharing very simple and convenient (Tella, 2018). The new technology brings forward to the information field many products and services which have changed the nature of fundamental library objectives and operations. There are two technologies that have contributed to these revolutionary changes. These are Computer technology and Telecommunication technology. The introduction of these two have changed and transformed the landscape of service delivery in academic library. Due to resources sharing academic libraries now find it easy to satisfy the user in terms of meeting their information their request (Tella et al., 2018). Similarly, it is now uncommon to see users complaining that the libraries have not met or satisfy their information needs or requests. It is the resource sharing that is making this possible. It is the resource sharing that is making participating libraries to actually satisfying the needs of all their users particularly in this age. In essence, the service delivery in most academic libraries has improved due to participation in resource sharing.

Resource Sharing in Nigeria

From the available anecdotal records, it has been established that John Harris ignited the flame of library cooperation in 1955 by submitting a memorandum to the Nigerian government advocating for the establishment of a Library Advisory and Consultative Committee for Resource Sharing. He further observed that, in 1974 the National Library of Nigeria initiated a resource sharing and networking scheme which involved the machinery for the establishment of National Union List of Serials (NUSLOS) which eventually took off in 1977. The subsequent conference on cooperative acquisition held in Kaduna in 1980 resulted in the National Union Catalog (NUC) (Okeagu & Okeagu, 2008). In 2004, the committee of University Librarians of Nigerian Universities (CULNU) formed the Nigerian University Libraries

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

Consortium (NULIC) to embrace all universities with the view to expanding it to include all academic and research libraries in Nigeria. Some of the objectives include:

- Promote resource sharing among member libraries
- Make the academic resources of each member library available to all the others
- Ensure that member institutions contribute meaningfully towards sustaining the consortium.

The establishment of the National Virtual library Project in 2001 by the Federal Ministry of Education with the mission to provide an equitable, cooperative and cost effective manner, enhanced access to national and international Library and information resources as well as sharing locally available resources with libraries all over the world using digital technology added impetus to the importance of resource sharing. In this scheme, Nigerian Universities are to contribute their research information which would be placed online for sharing.

Nigerian Universities Network (NUNET) is another initiative by the National Universities Commission to encourage Universities to network and share information for their academic and administrative functions. Other resource sharing projects are the Nigerian Periodical Index (NPI) of CULNU and the National Documentation and Library Center for Science and Technology (NADICEST)

In summary, a dozen efforts to create resource sharing initiative include the:

1. National Research and Education Networks (NRENS) in Nigeria include:
2. National Virtual (Digital) Library Project (NVLP)
3. Nigerian Virtual Library Consortium (VLC)
4. eLFL Net- Consortium of Nigerian Libraries
5. Nigerian Universities Management Information System (NUMIS)
6. Nigerian Universities Network (NUNET)
7. Nigerian Education and Research Network (NEARNET: a collaboration of NUNET, Poly Net and Teach Net).

Resource Sharing in the Digital Age

Some decades ago, the libraries have witnessed impact of information technology that has been affecting the structure of the services to a great extent. Moreover, the problems of space, standardization, professional development of the staff, challenges posed by new technologies, drastic cuts in the library budgets have aggravated problem of the present day librarianship. However, the solution to the problems of information explosion, ever changing needs of users, increasing amount required for subscription to same number of periodicals, shrinking library budget, and devaluation of Naira and its impact on the library acquisitions can best be overcome through resource sharing. This is through: a) use of computer and communication networks for resource sharing; b) Use of national and international databases through communications networks; and c) Introduction to full text database systems.

Various Resource Sharing networks have been observed at local, regional, national and international levels. Normally, three levels of national resource sharing networks exist:

1. **Local**: Information is stored in the local libraries in the form of Union Catalogue for local collection available in local libraries.

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

2. **Regional**: Information is stored in regional libraries and services are provided on broad subject area basis.
3. **National**: National Union catalogue is prepared on national basis and services are provided to users based on national resources.

The advent of ICT has not only revolutionized the process of resource sharing but has also brought about fundamental transformation from the traditional approaches to modern approaches. These modern approaches of resource sharing include:

1. Provision of internet facilities
2. Electronic mail
3. Provision of e-library
4. Teleconferencing and video conferencing
5. Office automation etc.

Shared acquisition of electronic content and electronic document delivery has now become the most common form of RS in the world. No doubt, resource sharing is now seen as vehicle for effective information dissemination and services in this digital age to participating libraries. The resources now being shared are the following (Ashikuzzaman, 2015):

1. Online indexes
2. Electronic books and texts
3. Electronic journals
4. Electronic catalogues (Library Catalogues)
5. Reference sources
6. Statistical sources
7. Sound recordings (music).
8. Image databases (arts, maps, medical etc.)
9. Games, Educational games etc.
10. Video recordings.

Academic libraries are not just physical or structure building any more. They are vast collections of online resources that users can access from campuses, offices, cyber cafes, anywhere and everywhere around the world. They are not independent, stand–alone collections. Their holdings are interdependent with those of partners' libraries in order to bring the broadest possible range of materials to shared, often overlapping pool of users. They are not static repositories of published information, whether print or virtual; they are active initiators or new collecting areas, new publishing paradigms and new preservation formats. Academic library buildings at this age, do not house just rows and rows of stacks of books. They contain computer laboratories, reading rooms, coffee bars, Multimedia and group study areas (Igu and Ojiegbe, 2017). They provide spaces for quiet independent study, group projects, consultations between instructors and students and even relaxation. They present exhibitions, teleconferencing, concerts, lectures, screening and symposia. They are both fully wired and wireless, so users can access the internet throughout the buildings.

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

Digital Tools Available for Resource Sharing Among Academic Libraries at the Digital Age

Sharing of resources in this digital age among academic libraries is taking another dimension due to the availability of different digital tools. Urhiewhu, Aji and Polygon (2015) indicated that academic libraries use such tools like Blogs; social media; Z39.50; Micro-blogging; Wikis; Social Bookmaking; Online Public Access Catalogue; Indexes and Abstracts; Bibliographies; Union catalogue; Web OPAC; Social network software and Directories in carrying out resource-sharing activities among the libraries.

Social Cloud

The social cloud is a platform for sharing resources within a social network. A Social Cloud is a resource and service sharing framework utilizing relationships established between members of a social network. Social Cloud as a resource sharing system stands on the following notions communication, cooperation and coordination. Users such as libraries involved in a social relationship communicate each other through a social network. A set of users of a social network bring about resource sharing through cooperation. The view about social cloud is motivated by the need of individuals or groups to access resources they are not in possession of, but that could be made available by connected peers which show users are willing to donate personal computer resources.

Learn Web 2.0

This is a resource sharing systems such as YouTube, Flickr, or Delicious provide diverse types of content and do not focus on a particular domain such as education. One of the feature is sharing through standing queries, where users are noticed whenever a new learning resource matches the query, LearnWeb2.0 Web platform provides a uniform interface to search for resources that are distributed across the ten integrated Web 2.0 services. Users can bookmark resources and collaboratively organize these bookmarks in groups. Results of a questionnaire (Abel et a., 2009) and a user study that is conducted at Leibniz University Hannover confirm the ability of LearnWeb2.0 to support sharing of resources.

BOINC

A System for Public-Resource Computing and Storage This paper introduces a software system, BOINC (Berkeley Open Infrastructure for Network Computing) that makes it easy for scientists to create and operate public resource computing projects. PC owners can participate in multiple BOINC projects, and can specify how their resources are allocated among these projects. The author describes the goals of BOINC, the design issues that they confronted, and solutions to those problems. Certain goals of BOINC include sharing resources among autonomous projects, rewarding participants by provide ”incentives” in order to attract and retain participants (Raj et al., 2016).

Google Plus (Google+)

A multilingual social networking and identity tool. Unlike other conventional social networks which are generally accessed through a single website, Google has described Google+ as a “social layer” consist-

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

ing of not just a single site, but rather an overarching "layer" which covers many of its online properties [38]. Google+ differ from other social network sites that it enables users to selectively share content with specific 'Circles' of people [39]. By introducing the notion with specific groups within their personal network, rather than sharing with all of their social connections at once.

Facebook

The research mainly concentrates on sharing the experience of librarians, explaining the applicability of Facebook in library services and sharing the users feedback about the experience of library services in Facebook. Libraries can conduct online events in which users can share their thoughts. The World Book Day, Librarian's Day, Copyright Day, Social Media Day, Science Day, Father's Day, Teacher's Day, Mother's Day, Friends Day, etc., celebrations of birth and death anniversaries of prominent authors, Institute foundation day, alerting the user about the upcoming institute events, etc., can be conducted virtually using this tool. In terms of Posting photographs – posting the photographs relevant to the events, photographs captured during the institute events, student achievements, faculty achievements, memorable photographs of the yester years of the institute, etc., will attract the student community and help the library to archive the information over the time-line. Facebbok is also useful for providing news – libraries can create alert system using Google Alert by giving Keywords related to Institute, subject domain the user community is interested, the hot topic in the news, etc. Selected alerts from these can be shared with the community. This will enhance the visibility of the library Facebook page.

YouTube

Special collections departments and college and university archives, many of which already have collections of digitized audio-visual materials, are using YouTube to share their collections. According to Tanya Zanish-Belcher YouTube is an easy way to provide access to collection of 10,000 motion picture films. No doubt about the fact that many university libraries across the world today are also using YouTube to help them share and promote their unique collections and increase access for offsite researchers. YouTube is a video-sharing website, created in February 2005, on which users can upload, view and share videos. Most of the content on YouTube has been uploaded by individuals, although media corporations offer some of their material via the site (2018). Balcikanli (2009) concludes that YouTube can be integrated as an effective online tool for language learning due to its ease of use and its connections to an abundance of video clips that not only teach languages, but also demonstrate the cultural contexts in which the language can be properly applied. The author believes that YouTube is an excellent platform for knowledge/resource sharing between an academic department and students. YouTube can be used to share videos about the department such as location, registration method and lectures.

Flickr

Flickr takes sharing photo collections to a new level of ease and creativity. New features like the Camera Roll and 1TB storage capacity make it appealing for professional photographers as well as casual users. Through Flickr, photographs of great events can be shared among libraries that are consortia. With Flickr, sharing of pictures, images and figures electronically among cooperative libraries has become unlimited. With Flickr, libraries can showcase a flattering image of their building or storefront so users/

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

customers can visualize the libraries location. Photograph local attractions and events, include addresses and driving directions of neighboring libraries, and place the photos on the Flickr map. Find and join library groups related to a library location by searching for the city, nearby cities and the state where the library is situated. Posting photos and joining discussions in those groups can help connect with local uses/customer.

Blog

A blog is one of the tools can be use for resources sharing (a truncation of the expression weblog) is a discussion or informational site published on the World Wide Web and consisting of discrete entries ("posts") typically displayed in reverse chronological order (the most recent post appears first). Until 2009 blogs were usually the work of a single individual, occasionally of a small group, and often covered a single subject.

Wiki

There are number of libraries that used Wikis, Flickr, or Blogs for publishing historical photos and ask people to identify people, places, or events pictured (Urhiewhu, Aji, & Gogmin, 2015). Different libraries use Wikis for content creation and to create a collaborative relation between library and the community. Hence IM (Instant Messaging), SMS, Twitter and email are being for answering questions (Convertive, 2011). Wikis facilitates collaborative authoring and can be considered one of the technologies used for resources sharing by libraries. Wiki was originally devised as a book sharing resource which is now being developed with a much broader and deeper remit. At a recent meeting at the London Action Resource Centre, librarians from Denmark, Norway, Papua New Guinea and Slovenia discussed how an online collaborative resource could be developed to serve as a multiple library catalogue. Participants can sign up as a node and enter all the books they have in their collections. Of course as the project develops many book titles will already be entered, and it will merely be necessary for users to add that another copy is available at their 'location'. Automatic input of ISBN details has already been organised to save a lot of typing.

Social Bookmark

Social bookmarking system is a web-based resource sharing system that allows users to upload, share and organize their resources i.e. bookmarks and publications. The system has shifted the paradigm of bookmarking from an individual activity limited to desktop to a collective activity on the web. It also facilitates user to annotate his resource with free form tags that leads to large communities of users to collaboratively create accessible repositories of web resources. Social bookmarking system allows user to collect, organize, share and label the resources, here bookmarks or publications, with arbitrary words i.e. Tags. According to Benz et al (2010), BibSonomy a social bookmark and publication sharing system that supports collaborative tagging where user can post his resources and categorize them from his personal point of view by providing tags (Yagnik, Thakkar, Kotecha, & 2014).

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

Twitter

Twitter is described as a social networking and micro blogging service that users like to use for short messages of 140 characters in length (Twitter, 2018). The short format of the tweet is a defining characteristic of the service, allowing informal collaboration and quick information sharing that provides relief from rising email and IM fatigue. Twittering is also a less gated method of communication: you can share information with people that you wouldn't normally exchange email or IM messages with, opening up your circle of contacts to an ever-growing community of like-minded people (Twitter, 2018). The short format is a unique way of communicating that has captivated the creative minds of millions of users and it is an interesting method for students to keep in touch with each other as well as with the lecturer and/or the department.

Using technology to streamline your workflow and processes provides benefits to your organization and to your patrons. Using appropriate technologies saves staff time (and thus money), results in fewer errors, shortens patron wait times, and helps to integrate ILL processes with the rest of the library. This doesn't always mean you need to purchase the newest, most expensive product. Rather, aim for effective, efficient use of technology where it will have the most impact.

Essential Conditions for Functional Resource Sharing in the Digital Age

As emphasized by Igu and Ojiegbe (2017), there are existing resources sharing that have some time-tested principles which propel their wheels of success. The authors identified few of them to include:

ICT Infrastructure

For a RS to function properly in this age, it has to be built on a sound ICT foundation. Several requisite ICT infrastructures are needed. These include but not limited to:

1. Appropriate internet bandwidth for each member library. This will guarantee fast and reliable connection to the internet.
2. Adequate servers for website and other resource hosting.
3. The appropriate hardware and software need to be properly installed.
4. Service quality in terms of ICT support and maintenance has to be readily and easily available for smooth running.

Human Capital

According to (Igu & Ojiegbe, 2017), every functional RS, no matter how technologically endowed, needs a trained human capital to function. This implies the need for libraries to equip its staff with the latest ICT skills. These ICT skills need to be updated periodically and regularly as they can easily become outdated. There is no doubt about the fact that technology easily becomes obsolete, therefore the need for routine ICT training to keep up with innovation is germane.

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

Work Flow Analysis Study

Libraries in RS need to adopt a similar workflow by carrying out a comprehensive workflow analysis (Igu & Ojiegbe, 2017). This is to ensure a seamless pattern of operations. Relevant to this, Edewor and Omosor (2008) stated that every viable library consortium formation is built on well-articulated broad base guidelines, depending on participating libraries situation. In the light of this, libraries in a consortium should also use similar equipment such as software so as to achieve a synchronized data flow and exchange. A vivid example is that most of the participating libraries in Nigeria are using KOHA integrated library system (see Tella et al, 2018, WRLC. 2017).

Other than hardware and software, Muthu (2013) emphasized that the following facts should be taken into consideration to make resource sharing effective and successful. They are:

- Willingness to share and Commitment to share
- Planning and preparation
- Policy guidelines and firm acceptance and technical compatibility
- Trained manpower and proper monitoring and feedback
- Ensure proper mechanism
- Transport, Courier, Network, Other communication facilities
- Do not look for immediate benefits and involve all those concerned
- Frequent meetings reliability and review.

The Ethics of Library Resource Sharing in the Digital Age

Ethics concerns itself with what is good or right in human interaction. It revolves around three central concepts: “self”, “good” and “other”. Ethical behaviour results when one does not merely consider what is good for oneself, but also considers what is good for others. It is important that each of these three central concepts be included in a definition of ethics. (Rossouw:2006:3) (Lindsey & Prentice:1985:4). Ethics is a code of thinking and behavior governed by a combination of personal, moral, legal and social standard of what is right. Although, the definition of right varies with situation and cultures, its meaning in the context of a community intervention involves a number of guiding principles with which most community activists and service providers would probably agree. Four of the most ubiquitously referenced ethical theories: justice as fairness; utilitarianism/consequentialism; rights theory/deontology; and common good theory are relevant (Polner, 2012).

Fairness

The theory of fairness, or justice, requires that societies establish basic rules and conditions that are fair to everyone, rather than allowing everyone, or some, to pursue their individual self-interest completely unchecked. Any policies and conditions should ensure that all members of a society, even the weakest, poorest, and most vulnerable, get fair access to social goods. Within the context of resource sharing, for instance, this means ensuring access to digital information for people with visual disabilities or who cannot afford access to a computer or other electronic reading device.

What is fair is not necessarily equal or the same, though. John Rawls explains, through his concept of “the difference principle,” that some people may claim a larger than equal share of social goods, if

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

unequal distribution improves the condition of the worst off members of a community in the long run (Sandel, 2009). In libraries, this means that certain patron types – e.g. faculty – may have more privileges, because of limited resources and differing needs. However, treating people differently for no good reason is a violation of the principle of fairness.

Libraries are full of rules that help make the system work. When simple and reasonable rules and procedures are established and followed impartially, everyone is treated fairly. ILL departments also rely on consistent rules to effectively and efficiently deal with multiple transactions. However, there are always exceptions and being inflexible in the face of differing circumstances is not fair. In addition, when rules are based on outdated realities, then these must be rethought, especially as information sharing rapidly changes along with technological advances.

The theory of justice as fairness also argues for balancing competing interests and ensuring that the costs and benefits of a complex system are distributed fairly. In resource sharing, for instance, there are the interests of local versus distant patrons, authors and publishers, students and faculty, lenders and borrowers. Of course, what some want may be spurious or even wrong – for instance, if library administrators do not understand that ILL departments need enough staff and budget to be good lenders, as well as borrowers. So, in order to balance competing goods librarians should consider whose good counts, who pays and who benefits from resource sharing. Only then can they judge the ethical coherence of what they are doing.

Obviously, librarians must make hard choices about what services to provide, how to provide them, and to whom. Utilitarianism provides a readymade theory for analyzing alternative schemes of service provision through cost-benefit analysis. For example, ILL departments may want to purchase article access from document suppliers to make sure requests are filled quickly, but can only do so if the fees are not too high. Since ILL success is dependent upon completing specific and tangible transactions – allowing goods such as minimizing turnaround time or maximizing volume of filled requests to be achieved for the least cost – many decisions in ILL departments are based on utilitarian considerations. Any service costs money and can be valued in monetary terms (albeit imprecisely). So, as library budgets decrease, whatever benefits are produced from certain policies and procedures need to be balanced by their costs.

Rights

Some theorists believe that the goodness of an act is based on the rights that human beings have. The most influential rights based theory was developed by JohnLocke. Modern rights theory takes the view that individuals have certain inherent rights simply because they are human beings possessed of reason and autonomy. In theory, such human rights cannot be superseded, even by contracts (Freeman, 2002). Likewise, in theory, human rights cannot be violated, even if they promote the greater good of the greater number (utilitarianism) or some other ethical norm (however, one could argue that in very rare cases, such as for purposes of national security or public safety, individual rights, such as privacy, might be temporarily curtailed) (Etzioni, 1999). Of course, not all of these rights are universal rights. For example, library patrons might claim that they have a right to receive any book or article, when they need it, in the format they choose, and for free. Realistically, though, libraries cannot always provide that level of service. Instead, they can try to meet a broader right to education and self-cultivation in a number of different ways and on a schedule that balances the needs and interests of the entire community with available funds. Different groups may also claim rights that compete or conflict. For instance, the right of ownership implies that if anyone wants to use an author's work, then they have to attribute it, and either

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

pay or get permission to use it. Since publishers contribute to the production of intellectual property by vetting, editing and distributing it, they, too, can claim a moral and legal imperative. However, publishers also infringe on the rights of academic authors by taking copyright and further payment away from them, then limiting the distribution that authors want and that society and individuals need to further the development of knowledge. Copyright laws that explicitly address ILL are designed to protect this right. While librarians might consider library service to be a right of all citizens, not everyone agrees, and resource sharing is often viewed, funded and staffed as a supplementary, rather than as a core service. Rights theory is important because the system will only work if librarians understand, respect, and advocate for the rights of everyone involved. However, it alone is not sufficient for making ethical decisions in resource sharing or any other matter.

Common Good

An ethical theory of the common good distinguishes between the short-term self-interest of individuals in society and the long-term welfare of the entire society. Common good theory considers what kind of society people want to live in, asking people to refrain from behaviors that undermine such a society, and to develop behaviors that promote it. Achieving effective collective action on behalf of the common good requires making rules and policies that discourage problematic actions or that deplete resources that everyone needs. Unfortunately, some people are tempted to overuse common resources, either because they do not believe their individual actions will make a difference or because they want to acquire as many benefits for themselves as they can, assuming everyone else will do the same (Hardin, 1968). In the context of libraries and ILL, reducing the environmental impact of printing and minimizing access fees appear to be consistent with common good theory. Paradoxically, however, common good theory – like utilitarianism – offers arguments both for and against the open sharing of information, depending on whether one believes that this hinders or encourages the creation of knowledge (Wright, 1997; Massie, 2010).

Challenges of Resource Sharing at the Digital Age

Efforts have been made in the past to develop some forms of consortia in the African continent with each one achieving its own appreciable level of success. However, the same cannot be said of Nigeria. These failures were as a result of different factors. Etim, (2006) observes that libraries throughout the country, Africa's most populous, have tried to obtain access to the latest information, to improve the dissemination of information, and to provide high quality library services, but these efforts have failed because of several challenges some of which include lack of appropriate technology and trained manpower. As evident from the literature, a number of other challenges have been identified confronting resource sharing at the digital age. These include but not limited to (Adebayo, Isiakpona & Ashaolu, 2013):

Lack of Software Uniformity

Libraries make use of different types of software. Some are using Koha, others are integrated library system (ILS) while others have developed their in-house software. All of these constitute hindrance to RS. For effective consortium formation to take place, it is important for the partnering libraries to be on the same software platform.

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

Membership Subscription and Commitment

Commitment of the members to the consortium has always been a challenge, coupled with the slow rate at which some members pay their membership fees and share of subscription cost to e-resources.

Institutional Sponsorship

Getting the management of institutions to agree to commit huge amount of funds for the subscription of e-resources could be an odious task.

Membership

The slow pace of uptake of membership is affecting the rapid growth of the consortium.

Funding

There is an inadequate fund for the subscription to several databases. Since there is a library consortium in place, this meant that some databases very specific to an institution could not be subscribed and the institution that wished to subscribe to that, had to go it alone, which was often very expensive. Academic libraries should explore more alternative sources of funding as over reliance on the government on monies that are not forthcoming may not provide the desired solutions.

Power Outage

The electronic platform is a critical requirement for the building of consortium. The university libraries should consider providing backup power solutions such as solar energy, inverters and generators in the eventuality of power surge.

Slow Bandwidths and Network Security

The Internet is a vital necessity for consortium formation. Resources would be shared virtually therefore the required bandwidths and network security should be put in place in order to ensure the smooth running of the consortium.

Archival Copies

The problem of keeping archival copies of e-journals and adding them to the catalogues and holdings of the libraries is of great concern. For example, as the situation is now, if a user were to request a copy of an earlier published article at a later date it may not be possible for the library to get it.

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

Service Quality and Technical Support

Consortium formation requires experts for the maintenance of the hardware and software such as professional librarians and ICT engineers. The technical support team would have to skilled in the use of computer, Internet, electronic transaction processing systems, database management, to mention a few.

Indigenous and Local Collection

Coverage of indigenous collections in the databases could be a challenge. There is no single database that collates these collections. Some university libraries are archiving their publications in their Institutional Repository.

Inadequate Database Subscriptions

The inability to subscribe to a good number of databases hampers the ability of the consortium to offer a wide array of available sources. This is because compromises had to be reached on the types of databases to subscribe to as a group.

User Training and Re-Training

There must be training and re-training of library patrons in order for them to fully maximizes the e-resources. Without adequate training the resources that could have cost the institution huge amount of funds would not be maximized.

More importantly, there are issues associated with sharing digital contents. These bother on:

The complications of sharing digital information (e.g., e-journal articles, e-books, and digitized special collection) now that libraries provide access to so much information through these formats instead of, or along with, print and other physical formats.

Issues concerning the license terms that govern what librarians can share through ILL (copyright).

There are also technical issues with sharing e-books and copyright guidelines and restrictions on library information sharing and digitization.

Projecting Into the Future

Librarians must keep sharing information… but there will be new ways to do so, as well as new challenges (Bae, Mcgivney, Posner, & Schmidt, 2017):

- Privacy of information becomes more –or less -of a concern
- Costs increase or decrease
- More libraries join OCLC ILL
- Shared circulation systems among consortia become more popular
- Publishers lower article prices to compete with ILL fees and use OCLC IFM
- Open access publishing means that there will be less need for ILL
- The next Copyright Act enables more digitization of information or more ILL or less ILL.

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

- Implementation of new local system puts OPAC access on hold; reliance on national union catalog increases visibility of collective collection -- temporarily
- Information needs continue to exceed local collection capacity, even at the best-resourced institutions
- Move to electronic; less consortial impact
- Increased vulnerability to changes in information environment
- limited purchasing power
- limited local infrastructure
- Consortia lift … On demand research request

CONCLUSION

This discussion has focused on resource sharing as vehicle for effective library information dissemination and services in the digital age. In the discussion, I have been able to look at concept like resource sharing, information dissemination, information services and digital age all of which emanated from the title. In the discussion, I have considered how resource sharing is positively influencing information dissemination and service delivery. The discussion has addressed itself to some resource sharing initiatives in Nigeria. The increase in the value and demand of information continues to exert pressure on libraries to offer more effective service to their users. There is no doubt that the advent of ICTs has brought about a complete revolution to the library's traditional roles of retrieval and dissemination of information. In view of the liberalisation of information provision through ICTs, information services are beginning to shift focus from accumulation and ownership of information resources, to providing access, hence the emergence of many online initiatives.

Although online information sharing networks are not a panacea to all the problems facing information providers, they are, nevertheless, expected to open new avenues, enabling users to have access to vast information resources available within international databases. Such initiatives have had their share of successes and failures. The absence of clear policies and lack of commitment on the part of libraries in providing the necessary infrastructure has slowed the process cooperation that would have enhanced more effective resource sharing envisaged by many academic libraries. Libraries and information centres' in our universities have also had to deal with their internal problems, especially lack of funding. However, there are very good indicators that due to the digital age, online information has started to play a significant role in addressing the issue of information scarcity which is limiting most academic libraries from rendering effective dissemination and services to their clienteles.

RECOMMENDATIONS

In order for resources sharing initiatives to thrive and for many academic libraries to participate, it is important that there must be serious commitment by academic libraries to invest on ICT infrastructure and sufficient resources available for more effective and efficient resources sharing. Additional efforts should be geared towards scaling-up activities that have been successful rather than those that may retard progress.

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

The problem of inadequate funding of libraries has affected the libraries effective participation in resource sharing activities. A National Advisory Board with Government representation should be created to oversee resource sharing activities. This will be tasked with the responsibility of lobbying for funds

ICTs and the Internet present a number of possibilities for library resource sharing in the digital age; therefore it is recommended that a National Virtual Library should be created. This will act as the national focal point of the nation's bibliographic output. Standardized software can be sourced to link the websites of all these libraries.

It has been observed that there are no documented policies to guide resource sharing activities among academic libraries and this is one of the major hindrances. It is recommended that libraries generally irrespective of their types in Nigeria should be proactive in formulating a policy which will provide guidelines on library resource sharing.

REFERENCES

Abdulrahman, A. B., Awuhe, B. T., & Ojobo, E. A. (2015). Resource sharing and networking among University Libraries in Northern Nigeria: A proposal. *International Journal of Innovative Research and Development*, *4*(10), 385–389.

Abel, F., Marnzi, I., Nejdl, W., & Zerr, S. (2009). Sharing Distributed Resources in Learn- Web2.0. *Proc. of EC-TEL '09*.

Adebayo, O., Isiakpona, C., & Ashaolu, A. O. (2018). *Consortium building for effective electronic resource provision in Nigerian university libraries: matters arising*. Retrieved from http://webcache.googleusercontent.com/search?q=cache:zs8PI_pDU8UJ:www.ijsk.org/uploa ds/3/1/1/7/3117743/289199969916844345_consortium_building_for_effective_electronic_resource_provision_in_nigerian_university_libraries.docx+&cd=1&hl=en&ct=clnk&gl=ng

Anderson, K., & Still, J. (2011). An introduction to Google Plus. *Library Hi Tech News*, *28*(8), 7–10. doi:10.1108/07419051111187842

Ashikuzzaman, M. D. (2015). *Resource sharing in library: A brief information*. Retrieved http://www.lisbdnet.com/resource-sharing-in-library-brief/

Bae, P., Mcgivney, J., Posner, B., & Schmidt, L. (2017). *Library Information and Resource Sharing: Transforming Services and Collections*. Sharing Breakthroughs - OCLC Conference.

Balcikanli, C. (2009). Long live YouTube: L2 stories about YouTube in language learning. *E-Proceedings of the International Online Language Conference (IOLC)*, 91-96.

Benz, D., Hotho, A., Jäschke, R., Krause, B., Mitzlaff, F., Schmitz, C., & Stumme, G. (2010). The Social Bookmark and Publication Management System BibSonomy. *The VLDB Journal*, *19*(6), 849–875. doi:10.100700778-010-0208-4

Bhavan, B. R. A., & Narayana, P. (2011). *Resource Sharing, Library Networks and Consortia. National Conference on Collection Management in Changing Context: Problems and Prospects*. Kuvempu University, Shivamogga, India.

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

Borek, D. (2006). Perspective on building consortium between libraries and other agencies. *Library Trends*, *54*(3), 448–462. doi:10.1353/lib.2006.0023

Buchholz, I. M. (2011). *Provision of access to information in academic libraries in southern Africa: Two case studies*. University of South Africa.

Chatterjee, A. (2007). *Resource sharing among libraries in digital era: role of consortium*. Retrieved from www.isical.ac.in/serial/consortia/CBSOR-02.pdf

Chatterjee, A. (2016). *Resource sharing among libraries in digital era: role of consortia*. Dept. of Library & Information Science, Jadavpur University. Retrieved from http://www.isical.ac.in/~serial/consortia/CBSOR-02.pdf

Chen, S. (2013). Promoting resource sharing through consortia: A case study of Shanghai Library. *Interlending & Document Supply*, *41*(2), 59–61. doi:10.1108/ILDS-09-2012-0030

Convertive. (2011). *Using social media in major library systems*. Retrieved from http://www.convertiv.com/using-social-media-in-a-major-library-system/

Dhawan, S. M. (1999). Towards an Effective Solution for Resource Sharing. In J. L. Sardana (Ed.), *Libraries and Information Services in the Electronic Information Era* (pp. 214–219). Indian Library Association.

Dhiman, A. K., & Rani, Y. (2007). *Resource Sharing and Library & Information Networks*. New Delhi: Ess Ess Publications.

Edem, M. (2010). Key issues in Nigerian university Libraries consortia building and sustainability. *Library and Information Practitioner*, *3*(1), 167–174.

Edewor, N., & Omosor, U. (2008). Consortium Development in Nigerian Libraries: opportunities and challenges in a global information system. *International Journal of Social and Policy Issues, 5*(2), 15-25.

Esposito, J. (2015). *Libraries and Consortia in the Context of a Publisher's Strategy*. Retrieved https://scholarlykitchen.sspnet.org/2015/09/30/libraries-and-consortia-in-the-context-of-a-publishers-strategy/

Etim, F. (2006). Resource Sharing in the Digital Age: Prospects and Problems in African Universities. *Library Philosophy and Practice*, *9*(1), 1–15.

Igu, A., & Ojiegbe, G. O. (2017). Consortium Development and Resource Sharing, the WRLC Model: Creating Synergies for Success for Nigerian Libraries. *Journal of Applied Information Science and Technology*, *10*(3), 95–99.

Islam, M. M. (2012). *Present Status of Library Cooperation, Networking, and Resource Sharing in Bangladesh: Web-based Library Cooperation for Access to World-wide Information Mirza*. Library Philosophy and Practice.

Kairam, S., Brzozowski, M., Huffaker, D., & Chi, E. (2012). Talking in circles: selective sharing in google+. *Proceedings of the 2012 ACM annual conference on Human Factors in Computing Systems*, 1065-1074.

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

Muthu, M. (2013). Resource Sharing In Libraries: A Vital Role of Consortia. *International Research: Journal of Library & Information Science*, *3*(1), 210–225.

Nwalo, K. I. N. (2008). Consortium Building for the Effectiveness and Sustainability of Academic and Research Library Services in the Information Age: Nigeria in perspective. *Journal of Social and Cultural Studies*, *1*(1), 10–16.

Odini, C. (1991). Problems and Prospects of Resource Sharing in Developing Countries. *African Journal of Library, Archives sand. Information Sciences*, *1*(2), 93–108.

Okeagu, G., & Okeagu, B. (2008). Networking and resource sharing in Library and Information services: The case for consortia building. *Information. Social Justice (San Francisco, Calif.)*, *1*(2), 255–262.

Omekwu, C. O. (2006). Managing information and technology: Critical roles for librarians in developing countries. *The Electronic Library*, *24*(6), 847–863. doi:10.1108/02640470610714260

Posner, B. (2017). *Library information sharing: Best practices and trends. Challenges and prospects*. Library Resource Sharing. Graduate Center of the City University of New York.

Raj, A.J., Ravi, A., Raj, K., Bichu Ben, S.A., & Datb, D. (2016). Resource Sharing via Social Networks. *International Journal of Computer Science and Information Technology & Security, 6*(2), 1-3.

Rutledge International Encyclopedia of Information and Library Science. (1997). *Selective Dissemination of Information*. Rutledge.

Tella, A. (2018). *Reference and information sources and services*. A Course material/Class Note for Undergraduate Students. Kwara State University, Malete, Ilorin.

Tella, A., Innocent, E., Akanbi-Ademolake, H. A., & Oso, T. (2018). (in press). Perception, Use and Effectiveness of Open Source Library Systems by Academic Librarians in Selected Tertiary Institutions in Kwara State, Nigeria. *African Journal of Information System*, *14*(2).

Tweeternet.com. (2018). *Twitter.* Available at: www.tweeternet.com

Urhiewhu, O. L., Aji, S. B., & Polygon, G. (2015). Global Tools for Resource Sharing among Academic libraries in Nigeria. *International Academic Journal of Educational Research*, *1*(1), 34–41.

WRLC. (2017). *WRLC-Resources*. Washington Research Library Consortium. Retrieved December 31, 2017, from http://www.wrlc.org

Yagnik, S., Thakkar, P., & Kotecha, K. (2014). Recommending tags for new resources in social bookmarking system. *International Journal of Data Mining & Knowledge Management Process*, *4*(1), 19–32. doi:10.5121/ijdkp.2014.4102

Youtube.com. (2018). *YouTube*. Available at: www.youtube.com

Zulu, Z. (2015). *An assessment of resource sharing activities among libraries in Zambia* (Unpublished MLIS Dissertation). University of Zambia.

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

ADDITIONAL READING

Posner, B. (2012). The ethics of library resource sharing in the digital age. *Interlending & Document Supply*, *40*(2), 119–124. doi:10.1108/02641611211239614

Smith, D. (2016). Thriving in the digital age: conquests, challenges, and thoughts on school libraries. Retrieved from http://scitechconnect.elsevier.com/wp-content/uploads/2016/04/3-s2.0-B9780081002513000147-main.pdf

Withers, R. (2000). Resource sharing in the digital age. *Library Collections, Acquisitions & Technical Services*, *24*(2), 328–331. doi:10.1080/14649055.2000.10765678

KEY TERMS AND DEFINITIONS

Digital Age: This is otherwise referred to as the Information Age, a historic period in the 21st century characterized by the rapid shift from traditional industry that the Industrial Revolution brought through industrialization, to an economy based on information technology.

Information Dissemination: This refers to as an active distribution and the spreading of information of all kinds to the users or those audiences that deserve it.

Library Consortium: A library consortium refers to a group of libraries who partner to coordinate activities, share resources, and combine expertise. The International Coalition of Library Consortia is an informal discussion group of such consortia. Library consortia offer significant advantages to increasingly strapped libraries.

Library Cooperation: Library cooperation includes both the sharing of bibliographic data and the sharing of library materials. It is a means by which libraries in developing countries can provide users access to information when resources are scarce. Library cooperation is considered to mean an intent to share resources, knowledge, bibliographic data, services and even computer facilities to provide some or all aspects of library service. Since libraries have always had as a philosophic base the provision of information, first through books and later through electronic means, the concept of cooperation among libraries is by no means a fresh and new idea. Cooperation in libraries is an extension of cooperation as one of the fundamental motivations of human society.

Library Services: These are Services provided by the library to the users. This can include instruction on how to access and use library materials. The Library services / facilities include Circulation Service, Reference Service, Online reservation of books, Recommendation of library material, Current Awareness Service, Inter Library Loan Service, Photocopying / Printing Service, Orientation and Information Sessions, Selective Dissemination of Information, Audio Visual Service and Multimedia Section.

Resource Sharing: Resource sharing refers to the sharing of library resources by certain participating libraries among themselves on the basis of the principle of co-operation. This is applicable in sharing of documents, manpower, services, space, and equipment.

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

Chapter 5
Marketing Information Products and Services Through Digital Platforms: Tools and Skills

Roseline O. Ogundokun
Landmark University, Nigeria

Joel O. Afolayan
Michael Imoudu National Institute for Labour Studies, Nigeria

Adekanmi A. Adegun
Landmark University, Nigeria

Abiola G. Afolabi
Michael Imoudu National Institute for Labour Studies, Nigeria

ABSTRACT

Library and information science (LIS) has developed gradually over a period of time taking the opportunity of technology being spread widely. Library management system (LMS) is one of such earlier areas where ICT have been applied to the operations of the library. LSM will allow librarians to be keeping greater restriction over data stores and applications containing delicate, secretive, confidential, or revealing information about customers, products, clients. The emergence of cloud computing is creating a new area of research in relation to libraries. Cloud computing is being influenced by the developers of library systems to facilitate the possibility of moving away from ILS/LMS called library services platforms (LSP). This chapter studied and reviewed cloud computing, its uses, cloud computing in libraries and projects LSPS, market information products and services, digital platforms. Recommendations were made based on the outcomes of the study.

DOI: 10.4018/978-1-5225-9034-7.ch005

Copyright © 2020, IGI Global. Copying or distributing in print or electronic forms without written permission of IGI Global is prohibited.

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

INTRODUCTION

The emergence of cloud computing has tremendously provided help to most businesses and organizations to provide the organization's customers or users with quality services via the internet. The National Institute of Standards and Technology defines cloud computing as a platform for enabling convenient, on-demand network access to a shared pool of configurable computing resources (e.g. networks, servers, storage, applications, and services) that can be rapidly provisioned and released with little or no management effort or service provider interaction (Mell, 2009). Furthermore, in 2011, Priya gave a definition that Cloud computing is a technology which provides you a service through which you can use all the computer hardware and software sitting on your desktop, or somewhere inside your network but they are not actually installed on your computer, it is provided for you as a service by another company and accessed over the Internet. In one developmental study, (Cleveland, 2012) Cloud computing as a technology that uses the Internet alongside the central remote servers to maintain data and application. Hence, cloud computing is a technology that is fast move out and becoming apparent and visible that will offer permission to users to store files, share files and applications on the Internet.

In the study by Olabiyisi, Fagbola, Babatunde (2012), cloud computing is an elastic and scalable utility model that offers flexible, ubiquitous, on-demand network access to a shared pool of configurable computing resources (for example, servers, data centers, networks, applications and services) that can be rapidly provided and released with limited interaction of service provider or the management. It provides shared infrastructure, self-service, dynamic and virtualized pay-per-use platforms which put it on high demand. Cloud computing implies a level of dynamic, flexible resource sharing and allocation of assets.

According to Tuncay (2010), a library can benefit from using cloud computing technology by increasing computing performance, storage capacity, universal accessibility and cost reduction. This can help the library in terms of fixed and maintenance cost reduction in the IT investment of both hardware and software as well as computer services. With cloud computing, libraries may prevent financial waste, better track staff activities, and avert technological headaches such as computer viruses, system crashes, and loss of data. When cloud computing is used in the library, this will likely have a significant impact on library services.

In 2012, Spreeuwenberg's study of cloud computing, the author stated that it has become easier to access data with several devices. Especially for mobile devices, this can be really useful since the only thing that is needed is an internet connection. Libraries are shifting their services to cloud computing technology to facilitate its services anywhere and anytime. In libraries, the following have been identified as possible areas of applying cloud computing: Building Digital Library/Repositories, Searching Library Data, Web Site Hosting, Searching Scholarly Content, File Storage, Building Community Power, and Library Automation.

Prior to application of Information and Communication Technology (ICT), the tasks in the libraries were performed manually and independently from one another. Tasks such as collection development, cataloging and classification, circulation and reference services, current awareness (CA), selective dissemination of information (SDI), and other bibliographic services were being carried out manually and far from one another. However, with the embracement of interdisciplinary concepts such as computer software/hardware and telecommunication engineering and technology, the services in the library are better carried out through the use of an integrated library system. An integrated library system (ILS), also known as a library management system (LMS), and henceforth referred to as ILS/LMS is an enterprise resource planning system for a library which is used basically to track items owned, orders made, bills

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

paid, and records of patrons who have borrowed library resources at one time or the other (Adegbilero-Iwari and Hamzat, 2017).

The decision to create a digital library in 2006 for a Spanish region with more than 40 hospitals, 1,500 primary care centers, and 28 centers for non-medical purposes, which attended a population of more than 8 million inhabitants was a turning point in the strategy of the Andalusian Health Ministry, but it also constituted a big challenge for the librarians who had worked at the Health System, most of them for more than 20 years.

LITERATURE REVIEW

Cloud Computing

Cloud computing can be described as the hosting and delivery of information, on-demand computing resources on the Internet using a remote network of servers. The alternative is storing, managing or processing data on a local server or personal computer. Cloud computing is the delivery of computing services such as software, databases, servers and networking over the internet and this means that consumers and users will be able to have access to software and applications from wherever they are. In cloud computing, computer programs are being hosted by an outside party and they reside in the cloud. Cloud computing transforms the way information technology (IT) is consumed and managed, promising improved cost-efficiencies, accelerated innovation, faster time to market, and the enhanced ability to scale applications on demand (Sethi, Alfakhri, Ashraf, Alasaad, &Alshebeili, 2017)

Cloud computing is the delivery of computing services such as software, databases, servers, and networking, over the internet. This means end users are able to access software and applications from wherever they are. The computer programs are being hosted by an outside party and reside in "the cloud". This means that users do not have to worry about things such as storage and power, they can simply enjoy the end result. The name cloud is gotten from the practice of drawing the internet as cloud-like in early 90's patent diagrams of the network so talking about cloud storage and cloud-based CRM means system resources and services that can perform things over the web which is also referred to as the internet.

BENEFITS OF CLOUD COMPUTING

Cloud computing proffers many advantages over traditional computing. It has made easier and possible online business increasing their earning potentials as well as offering customer access to as many stores as possible. Benefits of cloud computing includes Scalability, Data Security, Accessibility, Pay-per-use, Rapid implementation, Little or no up-front costs, Instant scalability, Maintenance-free, Access Anywhere and Better security

- **Scalability:** Cloud computing being scalable means that it can dynamically increase or decrease based on the retailers' or end users' requirements online.
- **Data Security:** This means that cloud Information is stored on a remote server; that is no information is lost even if a personal computer or internal network fails.

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

- **Accessibility:** This benefit means cloud remotely stores a catalog of products or services means that potential users, retailers or even customers can access the e-commerce site from virtually anywhere in the world.
- **Pay-Per-Use:** Pay-per-use means computing resources are measured at a granular level, that is the only resource users or customers, pay for are the ones they require.
- **Rapid Implementation:** A business can sign up and start using an application in the cloud instantly. Even the most wide-ranging enterprise applications are usually up and running in a matter of days or weeks, rather than months or years.
- **No Upfront Costs:** Businesses can do away with arbitrary up-front costs and start using applications straight away. Cloud software means it's possible to dramatically reduce or even eliminate capital expenditure costs and instead simply pay an all-in monthly fee for the service.
- **Instant Scalability:** With cloud-based applications, the number of users can be increased or decreased as needs change over time. That means businesses pay only for what is needed and never have to worry about running out of capacity.
- **Maintenance-Free:** Patching, upgrading, and testing applications can take up days of IT staff time every month, but with cloud applications none of this is necessary. That's because it's all handled in the cloud, leaving your staff with more time to work on new projects and innovations.
- **Access Anywhere:** Cloud applications are designed to be accessed securely from anywhere via any connected device.
- **Better Security:** Large companies lose an average of 265 laptops a year. If they contain confidential data, that's a serious security risk. With cloud applications, data is stored securely in the cloud so a stray laptop becomes an inconvenience rather than a potential disaster.

BUSINESS MOVING TO CLOUD

More and more businesses are looking to take advantage of the many benefits the cloud offers. Essentially, businesses are moving to the cloud for four key reasons and they are **Ease**: The cloud requires little effort by a business to maintain or manage it; **Efficiency:** Traditional on-premise computing generated step requirements in investment as capacity could not easily be varied; whereas cloud computing provides greater efficiency due to the sharing of resources across customers; **Access:** It's straightforward to access cloud-based applications and services from anywhere – all that is needed is a device with an internet connection and the last one is **Capacity:** The cloud is effectively infinite in size, so organizations never need to worry about it running out of capacity.

HOW SAFE IS THE CLOUD?

Cloud security, particularly for businesses, has become a much more reliable option than on-site data. The cloud effectively eliminates a number of security concerns simply by virtue of being located off-site, such as natural disasters or break-ins that could occur at your office.

Disgruntled employees have no access whatsoever to the physical servers that make up the cloud, and most cloud providers ensure that access to data is closely monitored, meaning that no one should be able to dump a bunch of company secrets onto a flash drive and walk out the door. That said, special

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

attention should apply to the security standards offered by the cloud provider, including measures to secure transmission and storage of data, as well as the physical security of the cloud provider data center to control the access rights of employees. There are three (3) basic types of cloud environments which includes Private – In this type of environment, a single organization, data center infrastructure or firm delivers cloud services to customers or internal users; Public – The services rendered in public type of environment includes applications for customer and transaction management and third-party providers deliver the services hosted in the cloud over the internet. They are usually sold as pay-per-use services and lastly Hybrid – This means two or more. This type of environment relies on the benefits of both public and private environments.

CLOUD COMPUTING SERVICE CATEGORIES

In addition to private, public and hybrid cloud environments that host and store information, clouds are also separated into service categories used for different types of computing. There are three basic service categories: Service categories are used for different forms of computing. Categorically we have three basic services. The first is Software as a Service (SaaS): The most popular among online retailers, allows merchants to run direct sales applications such as shopping carts in the cloud without their customers having to download or install programs to make a purchase. The second category is known as Platform as a Service (PaaS): PaaS is used for applications and development such as Apprenda, which runs applications like Java. Although not as prevalent in the e-commerce world and the third one is called Infrastructure as a Service (IaaS): Primarily focuses on providing data center infrastructure on-demand. Examples include Amazon Web Services used by Netflix to house their database of movie and television offerings.

HOW CLOUD COMPUTING WORKS

Cloud computing is based on the premise that the main computing takes place on a machine, often remote, that is not the one currently being used. Data collected during this process is stored and processed by remote servers (also called cloud servers), which means the device accessing the cloud doesn't need to work as hard.By hosting software, platforms, and databases remotely, the cloud servers free up the memory and computing power of individual computers. Users can securely access cloud services using credentials received from the cloud computing provider.

WHO USES THE CLOUD

Today, anyone who is online uses the cloud in their everyday lives, whether they realized it or not. Editing documents on a shared drive, sending emails, streaming films, storing files, sharing photos on Instagram — all these activities are made possible by cloud-based computing. For businesses, the cloud has been transformative. Whether using the public cloud (hosted by third-party providers) or a private cloud (hosted on-premise but still providing mobile access), or a hybrid of the two, millions of organizations large and small now rely on the cloud for almost all their computing needs. In the UK alone, the share

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

of companies using cloud-based services has grown from 48% in 2010 to 88% in 2017. Some 67% of current users say they expect to increase their adoption of cloud services.

DIGITAL PLATFORM

Libraries may soon be building and managing their own data centers. This model would let libraries maintain more control over the applications and data stores that contain sensitive, private information about patrons. Provisioning and maintenance of infrastructure for Web-based digital library present several challenges (Sanchati& Kulkarni, 2011). The found digital devices must be relevant to the user's need for information. In this sense, many Digital Libraries tend to the specialization of their collections and their vision of Library. This connection between the development of a collection, the searcher and the user interaction indicate us that the main service of a digital library is to provide access to information.

About the digital, we can access to the collections with a high intellectual and monetary value but if the user is not proper or if the statistics are zero the development in collections neither will work nor our investment. Thus, the factor that decides the success of a Digital Library is the user. And all services must be focused on satisfying his need for information. A digital platform refers to the software or hardware of a site. For example, Facebook is a digital platform. Quora is a digital platform. Twitter is a digital platform. Instagram is a digital platform. Etc. The platform isn't an individual thing. It isn't a piece of software or a website

As libraries increasingly use digital infrastructure to provide access to digital content and resources, there are more and more opportunities for collaboration around the tools and services that they use to meet their users' needs. It is possible for each library in the country to leverage and benefit from the work of other libraries in shared digital services, systems, and infrastructure. There are many definitions of digital platform and some definitions are present below using their key attributes.

1. It is a technology-enabled business model.
2. It facilitates exchanges between multiple groups – for example, end users and producers – who don't necessarily know each other.
3. It offers a value that is proportional to the size of the community. There are network effects. A Digital Platform is worth nothing without its community.
4. It is a trust enabler it must generate trust with clear general terms and conditions regarding intellectual property and data ownership. It also helps consumers and providers to trust each other within the network thanks to scoring mechanisms.
5. It has open connectivity: it shares data with 3rd party developers to create new services and extend the ecosystem. This is done with APIs and participates to the API economy.
6. It can scale massively to address millions of consumers without performance degradation.
7. It offers compelling user experience: easy to use, no training needs, self-service.
8. It has innovative business models based on immediate value.

What are the benefits of a Digital Platform?

The benefits of digital platform include Generating revenue, reducing costs, fostering collaboration and innovation for new products and services and gaining speed to put products on the targeted markets.

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

Examples of Digital Platforms are as follows: Google search engine: "advertising" business model; Social platforms: Facebook, Twitter, Instagram, LinkedIn – "advertising" business model; Knowledge platforms aka forums such as Stack Overflow – "advertising" business model; Application stores: Apple/ Google Play – "digital good" business model; Marketplaces: Amazon marketplace, shopping engines: "e-commerce" business model; Media platforms: Spotify, Deezer– "subscription" business model; Affiliate platforms: Commission Junction … – "earn as you perform" business model; Crowd-sourcing platforms: Uber, BlablaCar, Airbnb – "pay as you go" business model; Repository platforms: GitHub – "freemium" business model: you pay only if you don't want to share your code with the community; Infrastructure platforms (IaaS): AWS, Azure – pay as you go" business model and Classifieds platforms: real estate … – "advertising" business models

THE DIGITAL LIBRARY

There are different events for the development of Digital Libraries to occur. The most common ones are the Academic events which offer services to a community associated with an educational institution. Usually, they can be mixed or hybrids, that is to say, they have a physical component that is reflected in a digital platform. Other Digital Libraries are purely in an online format, and they supply access to the information that only exists at a digital level. Most of the times, they are created from repositories or exclusive information from the Sponsor Institution. Several digital libraries define themselves as specialized or multimedia. In this way, they provide varied information technologies for the recovery of digital information.

Moreover, these platforms offer options of access to the information via purchase, subscription, membership or Open Access. Being this a way to leave in the user's hands the choice of how to access digital information or to collections of a Digital Library. Through the analysis of different existent digital libraries, we can identify the elements that constitute them:

1. **Digital Aspect**: We refer to the way and via in which the interaction between users and knowledge occurs. Specifically, to the way that characterizes the access to information nowadays.
2. **A Platform of Access to Information**: It is the basis that provides access to the Digital Library through an electronic address or application that allows the access to the digital information system.
3. **Digital Information System**: Multidisciplinary equipment responsible for the setting up of the accesses to digital collections.
4. **Digital Collections**: Collections are grouped under various characteristics as of topics and access. Most of the times the Digital Library will provide access to its own information, either compiled or digitalized by the Sponsor Institution. In the same way, collections with information technologies collected from the web and separated under the compilation platform policies will be developed. In other occasions, it will buy the varied database from suppliers of digital information that will provide access under the security conditions associated with federated access technologies that will allow a specific development of collections either in an annual subscription or other variation. This restriction of the access is one of the main challenges that Digital Libraries must face. This is because they must arrange diverse ways of access to information between its Platform and the validation of users creating federated identities for the access to services.

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

5. **A System of Digital Reference**: Unit dedicated to providing the most possible autonomy to the user in order to develop himself in the platform of access to information. The reference in the digital library accomplishes the connection role because of successful reference services if they can connect the user from anywhere and anytime with the required information.
6. **Digital User**: Digital users go to the information via the access platforms because of the need for specific information that must be fulfilled in the fastest way possible. For this purpose, the user has an endless quantity of digital devices that provide access to the digital surroundings. These information technologies gather each other and reach the total connectivity through internet connections.

Also, there are other factors that made a digital user closer to the Digital Library. We cannot forget that the user had walked a long way either physical or digital to access an online information service. Thus, we must take into account that the user has a personality, an environment, and a job. These characteristics plus his purchasing and connectivity power made him digitally independent, so he can access to digital files without the need of an intermediary.

It exists other factors that determine the user digital independency that corresponds to the fact that digital libraries do not have files with unique access, so it is possible to find a digital document without even entering to the library that has it. So, the user that access to the digital library is the one who has a specific need of information that big search and references motors cannot satisfy.

REVIEWED LITERATURE/ARTICLES

Cloud computing according to Cleveland (2012) is a technology that uses the Internet alongside the central remote servers to maintain data and application. In other words, it is a technology that allows users to share files and applications over the Internet including storage. In 2009, Banerjee provided an overview of technological researches performed in HP labs, and a cloud-scale intelligent infrastructure attracts, smart environments like utility computing, smart data centers, pervasive computing, automation, virtualization, and intelligent networks already penetrate many spaces of our daily life (Klein &Kaefer, 2008). Cloud computing is an emerging application platform and aims to share data, calculations, and services among users. The methods to model it with the challenges like user interface, task distribution, and coordination issues are explained and evaluated in (Lijun, Chan, &Tse,, 2008).

In research of cloud computing (Grossman, Gu, Sabala, & Zhang, 2009) the authors developed a cloud-based infrastructure which had been optimized for wide area, performance networks and supported necessary data mining applications. Cloud computing infrastructures accelerated the adoption of different technological innovations in academia and its facilities and resources could be accessed by the colleges as on–demand. (Praveena& Betsy, 2009) provided a comprehensive introduction to the application of cloud in universities. (Delic& Riley, 2009) assessed the current state of the Enterprise Knowledge Management and how it would turn into a more global, dependable and efficient infrastructure namely cloud computing. They discussed architectural technologies and related applications.

The basic features of cloud computing are presented and compared with the original "Grid Computing" technology (Aymerich, Fenu, Surcis, & IEEE. 2008). They introduced new services that will replace many types of computational resources currently used. In that perspective, they also consider that grid computing will play a fundamental role in defining how cloud services will be provided. SaaS, the software deployment service provided by the Internet Service Providers (ISP) and the carrier companies is

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

expected to change the current system architecture of the organizations and thus is accepted as another innovation for the network society (Hirata, Imai, Noguchi, & Asano, 2008).

In the software-as-a-service (SaaS) cloud model, service providers supply the hardware and software products and interact with the user through a web portal. Services can be anything from Web-based email to inventory control and database processing (Newton, 2009). Cloud provides the opportunity of flexibility and adaptability to use the computing resources on-demand. Contrary to having only one service provider, different providers use different interfaces to their compute resources utilizing varied architectures and implementation technologies for customers. Although this creates a management problem, a common architecture facilitates the management of computing resources from different Cloud providers in a homogenous manner (Dodda, Smith, &Moorsel, 2009). Mitchell (2008) provided an overview of existing learning architectures and raised questions about how educational institutions are managing cloud computing resources. He also brought reasonable explanations for the challenge of indexing web resources for optimum discoverability by students and educators

In (Juan-Quilts and Muñoz-Gonzalez], the skills developed by these research librarians and the new profiles needed to ensure the sustainability of the Andalusian eHealth Library are the object of this study. The goal of (Muhss, Neumann &Schmietendorf) research study is to describe and evaluate the current level of commoditization in the cloud industry, leading to recommendations for the continuous success of cloud services. The current research of the authors of this paper is focusing on these standards, platforms, requirements of customers and providers as well as procedural and organizational implications. Results are to be expected within the next year.

(Ojala&Tyrväinen, 2011), in this paper, the authors examined the value of networks in cloud computing. They demonstrated the kinds of value offered by such networks to firms within a given network and considers how and why the network may change over time. The paper also reported on a longitudinal case study, including a total of seven semi-structured open-ended interviews, conducted with five informants from the case firm. It was found that cooperation in value networks provides not merely financial benefits, but also knowledge, plus intangible benefits. Value networks should be evaluated as a whole, since there may be indirect connections – i.e. the value comes not directly from customers, but through the partners in the network. The study also shows the dynamic nature of value networks, as illustrated by changes in a network that were based on transformations in the market environment, and on product development.

(Ryan, 2012) stated in his paper that there are a wide variety of cloud computing services but the most likely to be useful to libraries and other organizations are Infrastructure as a Service, Platform as a Service and Software as a Service We know that library is not only a knowledge ocean, its ultimate aim is to provide satisfactory services for all the people. So, in the new era, a library should improve itself constantly by adopting many new IT technologies. And in this paper, we attempted to improve the current user service model in the university library by using Cloud Computing.

Although the study of Cloud Computing is still in the initial stage now, impacts brought by Cloud Computing are obvious. With the introduction of Cloud Computing to a university library, services of libraries will have a new leap in the near future. Services provided by libraries will become more user-centric, more professional and more effective, etc. And we all believe that libraries will create more knowledge benefits for our country with the help of Cloud Computing. The cloud environment is a highly developed network environment; it appears to the users of high-quality service and high security. The Cloud computing techniques and methods applied to digital libraries, not only can improve the utilization rate of resources to address the imbalance in development between regions, but also can make more extensive use of cloud computing to our work life (Sanchati and Kulkarni, 2011).

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

Digital libraries are frequently treated just as a new method of storage of digitized artifacts, with all consequences of transferring long-established ways of dealing with physical objects into the digital world. Such attitude improves availability, but often neglects other opportunities offered by global and immediate access, virtuality and linking — as easy as never before.

The article presents the idea of transforming a conventional digital library into a knowledge source and research collaboration platform, facilitating content augmentation, interpretation, and co-operation of geographically distributed researchers representing different academic fields. This concept has been verified by the process of extending descriptions stored in thematic Digital Library of Polish and Poland-related Ephemeral Prints from the 16th, 17th and 18th Centuries with extended item-associated information provided by historians, philologists, librarians, and computer scientists. It resulted in associating the customary fixed metadata and digitized content with historical comments, glossaries of foreign interjections or explanation of less-known background details.

In Fuente, the author of this research work proposed the need to define The Digital Library in relation to the elements that constitute it, its attributes, services and the experience of access to information that it offers to its users.

Adegbilero-Iwari&Hamzat, 2017 the authors review cloud computing in libraries and project LSPs as the reliable path to its adoption in Nigerian academic libraries. Recommendations were made based on the outcomes of this study.

USERS SERVICE MODEL IN UNIVERSITY LIBRARY

University library, as a most important academic and scientific research base, charges for giving access to information services for its users. Many libraries insisted that their services are based on their own library resources in some years back. So, librarians scarcely considered users' demands. But today, modern libraries have changed this viewpoint. And librarians usually need to collect as more information as they can do it according to customers' requirements. Then they will analyze the information and sort them out. Finally, they will provide them for customers or end users in some certain technical methods.

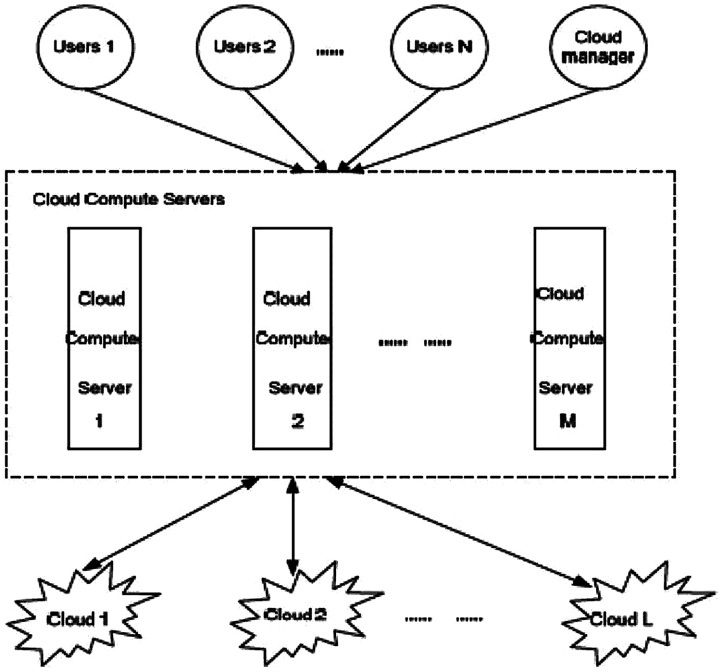
However, services in modern libraries will increasingly focus on users' demanding in the future. And the ultimate goal of the modern library is to offer adequate, appropriate, comprehensive and multi-level services for its users. Most current users' service models are mainly World Wide Web service model, FTP service model, BBS and E-mail service model, etc.

With the development of computer, network and information technologies, the digital library faces a great challenge, such as resource storing and sharing, various personal services requirement, and so on. In order to solve these problems and put the digital library into full play, the existing library space and time constraints must be a break. In the new time, a digital library should carry out the humanist service. Cloud computing is an effective way to promote digital library development.

Based on current trends, digital platforms will become the preferred and dominant business model for banks and financial institutions in the future. Digital platforms offer consumers and small businesses the ability to connect to financial and other service providers through an online or mobile channel as an integrated part of their day-to-day activities. Researchers within the information systems (IS) field and beyond are seeking to understand the omnipresent digital platforms in today's industries (Tiwana, 2014; Parker, Alstyne, & Choudary, 2016). Social media platforms like Facebook have changed how people interact and share experiences. The emergence of peer-to-peer digital platforms such as Uber, Airbnb,

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

Figure 1. Cloud computing implementation diagram
(Source: Fuentes)



and Task Rabbit has created a so-called sharing economy. Competition no longer revolves around how to control the value chain but around attracting generative activities associated with a platform.

As digital platforms are competing on multiple levels of the technical architecture, for instance, the operating system and browser in the mobile domain (Pon, Seppala, & Kenney, 2014), specifying the appropriate unit of analysis is becoming increasingly difficult. Platform providers such as Google, Facebook, Amazon, and eBay are carving up the Internet into de facto closed domains, implying that all relevant interactions take place outside the view of researchers (Eaton, Elaluf-Calderwood, Sorensen &Yoo, 2015). As platforms are emerging in highly diverse industries like banking (Reuver, Verschuur, Nikayin, Cerpa & Bouwman, 2015), health care (Reuver, Bouwman & Haaker, 2013), energy (Kiesling, 2016) and transportation (Svahn, Lindgren & Mathiassen, 2015), the scope and diversity of scientific discourse are growing rapidly.

DIGITAL TRANSFORMATION

Digital transformation is a part of a technology roadmap for most of the enterprises (especially the ones operating in the B2C domain). Digital technologies are disrupting the way end-users engage with online channels and reddening the way enterprises do business online. Enterprises strive to provide differentiated experiences to its digital consumers. Digital channels personalize information at all levels to convey the right message that resonates with individual end-users personality. Disruptive digital technologies build a participative digital platform enhancing user's digital journey and consistently aim to convert a visitor

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

into a brand advocate. As digital experience assumes the prime focus of online platforms, it becomes imperative to understand various aspects of digital technologies and use them to their fullest potential.

The digital transformation provides a wide variety of opportunities across a wide spectrum of business domains. We will look at various opportunities opened up by digital technologies, including a quick look at the key challenges while implementing them. Digital Experience, Digital marketing, digital commerce, and SMAC (Social, Mobile, Analytics, and Cloud) form a major chunk of capabilities required for customer-facing B2C enterprises. Key organization focus areas such as digital transformation, digital commerce, digital marketing, social and collaboration enablement, and legacy modernization comprise the main elements of a digital ecosystem.

Emerging Trends in Digital Platforms

Across business domains the key trends noticed in modern digital platforms are:

The increasing popularity of human natural gesture interfaces such as touch-enabled smartphones, gaming consoles; Responsive, interactive user interfaces that offer an immersive experience; Single-page applications (SPA) with simple and easy navigation model; Social, mobile, analytics, and cloud enablement; Active user engagement through collaboration, co-creation, and co-invention and Hyper-personalized contextual content, service, and functionality.

Marketing of Information Products and Services

Information is power and libraries and information centers are the reservoir of this power. The marketing of information implies transference of information to the perspective or potential user for consideration. Marketing of information is a set of activities by which information products and services are channeled to the potential users. The core of the marketing concept is user-oriented. Therefore, marketing and its techniques if applied to library and information services can help is vital to fulfilling the expected needs of information of the users. Marketing helps in increasing user satisfaction and brings in an element of competition, which results in providing better services. The focus is on saving time, money and labor and also adapting to the latest information technology.

In libraries, users are made to pay for the services in the form of annual subscription, caution deposit, fine, the penalty for lost books/ damaged book etc. This was only to make the user prompt in using library facilities. Of late the concept changed dramatically and information became a tradable commodity now, which has led to the emergence of marketing in libraries. Today the high value of information and its importance as a strategic resource for the development of a nation has changed the information into a product for selling in the markets.

Product Categories

The following are some categories of products

1. Documents (must exist in both print and electronic formats).The documents include Periodicals such as Learned journals academic journals; Professional journals; Magazines; Newspapers; Newsletters and bulletin boards

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

2. Reference documents such as Encyclopedias; Dictionaries; Bibliographies and bibliographic databases; Directories and databanks
3. Books such as Adult fiction, classics; Adult fiction, popular; Adult non-fiction, learned, textbooks; Adult non-fiction, popular; Children's fiction; Children's non- fiction; Paperback books; Hardcover books
4. Others: This includes Published reports from Government and other agencies; Videos; Music; CDs; DVDs; Multimedia documents; Government publications; Corporate reports-technical and business; Patents; Conference proceedings
5. Services such as Information services; Document delivery and interlibrary loans services; End-user training; Market research agencies; Information service providers (ISPs) Alerting services; Helpdesk services; Consultancy services; Financial and business information services; Entertainment services; Computing services. (Rowley, 2006)

Marketing Skills in Librarians

The modern world is the world of mechanization and computerization. Every technological development has immediately on its invention influenced librarianship and library services tremendously. Due to various technological developments, the face of the library profession has changed dramatically. Library and information technologists predict a paperless society and an electronic future for the libraries. Today, libraries are concentrating on speedy access to information. The information superhighway and the Internet enables access to knowledge from one place at any time at the touch of a button. Thus, today the users are better equipped to seek and select the required information in required form by using sophisticated technologies. Now there has been an increasing demand for information in electronic form rather than print. All these factors are forcing the professionals engaged in library and information services to rethink about the skill they have. The competitive marketing for products and services of information necessitate librarians to cultivate some of the following skills. The first is Analytical skills: The two basic analytical skills that a librarian must have are market analysis and product analysis. The market analysis is what the user wants and product analysis is what we are providing. A librarian should know the needs of his information users. Thus, he should effort to provide library services in accordance with the needs of the users. Second is Planning Skills: The librarian must be skilled in various planning skills like product development, distribution, promotion etc. Hence librarian should try to provide best services with minimum time and cost. He should also determine proper ways for the circulation of products as well as its accessibility to its target market. The third skill is Organizing skills: The marketing of information products and services should be a part and parcel of the organization policy. The staff for marketing should be properly trained and skilled. The whole organization of which the library is a part, need to be motivated for marketing activity while the fourth is Control skills: These types of skills require controlling the market. The librarian should keep himself/herself informed of the behavioral responses. This will help the librarian to gear the services to the ever-changing demands of the users.

The Marketing Mix

The 'Marketing mix' is a one way of profiling the offering that an organization seeks to make to its chosen customer groups. The marketing mix is frequently described in terms of the combination of four major tools of marketing viz., product, price, place, and promotion known widely as the 4Ps. The ex-

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

tended marketing mix adds people, process, and physical environment (the 7Ps). For marketing mix, the organization needs to undertake a range of processes in order to identify customer needs. One valuable source of such information is customers' responses to current product offerings, which will be evident through sales and usage levels, customer's server's complaints and other channels through which the organization listens to its customers. Other data may be collected on customers' attitude to potential new products, services or communication messages and to competitors' products.

- **Product:** This is the aspect of the marketing mix that deals with the management of the product. A product is everything that is received by the customer in a marketing exchange. Products can be ideas, goods, services, experience, organizations, persons or places, or a combination of two or more of these. The information industry offers access to information goods, such as books and databases, and also to services such as traditional library services, market research services and alerting services. A service is an activity or benefit that one party can offer to another that is essentially intangible and does not result in the ownership of anything. (Kotler et al., 2007). As differentiation from competitor offerings becomes more difficult on the basis of goods or services, organizations are increasingly looking to 'experiences' as their core offering. Experiences are memorable and personal and extend beyond their component goods or services.

Most organizations have many products described as their product portfolio. They may, for example, offer a number of different information services or licenses for a range of different databases. Information products are products whose core is information or knowledge. There is some discussion about whether information products should be treated as a separate category of product, due to the unique nature of information.

Products have both functional characteristics and psychological characteristics; the later is captured by the brand. For example, an MP3 player has product attributes such as storage capacity, size, color, software, sound quality, and battery life. It will also have psychological characteristics based on the user's perceptions of the benefits that it offers such as ease of use, quality, innovative features, stylishness, and reliability. There is typically a relationship between the functional and psychological characteristics of a product, and for services, it can be particularly difficult to differentiate functional and psychological characteristics. For example, the customer's perspectives will define whether the helpfulness of staff or accessibility of information sources are functional or psychological characteristics.

Product decisions are important because they directly involve creating products that satisfy customers' needs and wants. An organization needs to maintain a satisfactory set of products, this involves introducing new products modifying existing products and eliminating products that no longer satisfy customers and/or yield acceptable profits.

- **Price:** This covers activities associated with establishing pricing objectives and strategies and determining product prices. The price represents the agreed value of an exchange. Price may be used as a competitive tool and it is one of the marketing mix variables that can be changed relatively quickly to respond to changes in the environment. Price plays both an economic and psychological role. From an economic perspective, the price is closely associated with costs and profits. From a psychological perspective, the price may be used as an indicator of quality. In the service sector, the psychological role of price is magnified because consumers must rely on price

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

as the sole indicator of service quality because the intangible nature of service means that other quality indicators are absent.

- **Place:** Products must be available at the right time and at a convenient location. The place is concerned both with consumer services delivery points such as retail outlets and libraries, but also with the distribution network that ensures that products make their way from producer or creator to the user or consumer. Delivery channels are significant factors within an industry and involve a complex web of organization relationship, in which collaboration and competition are equally important.
- **Promotion:** This can also be termed marketing communication and relates to activities used to inform one or more groups of people about an organization and its products. Promotion can be used more generally to increase public awareness of an organization and of new or existing products or alternatively, it can be used to educate the consumer about product features or to maintain public awareness of existing products. Promotion includes advertising, public relation, personal selling, online marketing communication, and direct marketing. Promotion is one element of the two-way communication with customers that forms the basis for customer relationship.

Promotion of services presents specific difficulties because of their intangible nature. The intangible element is depicted in advertising, so service advertising needs to emphasize tangible clues, such as physical facilities or other concepts that project an image that reflects services. A tangible clue may be embedded in the environment, such as the building and service points occupied by a library building or the professionalism or the appearance of staff, but may also be used in picture form on publicity and websites. Personal selling is potentially powerful in services because this form of promotion allows customers and salespersons to interact. Customer contact personnel, therefore, have an important promotional function.

- **People:** Most services use people in service delivery, often creating and delivering the product in interaction with the customer. The quality of the interaction between the service agent and the customer is a major influence on satisfaction. In services where the level of contact is high, as an in dentistry or physiotherapy, the customer needs to feel comfortable with a service agent, to trust them and to develop a rapport with them, probably over a service relationship that comprises several service episodes. Even where the service is less intimate, as in a shop or a library, the attitude and responsiveness of the staff can make a difference to the acceptability of the service experience, and customer evaluation of service quality.
- **Process:** Services are manufactured and consumed life, and because they involve an interaction between two people, it is more difficult to exercise control and ensure consistency. The service process needs careful design; it may include queuing arrangements, processing customer detail payment, as well as elements of the core service delivery. For example, call center operator and helplines may have standard set or questions that they ask each caller. Once a customer has experienced a service process once, she/he will start to learn 'the script' which helps her/him to feel more comfortable with the process. In a self-service environment as, for example, with a public access kiosk, the customer is taken through a process by the prompts on the computer screen. These prompts form the dialogue or the online script. The quality of the service delivery in the online environment depends on customer's competence even more heavily than in physical service delivery. It is important to remember that customers, as well as a service agent, are part of service delivery.

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

Physical Evidence

This is concerned with the physical surrounding from which a service is delivered, and with other tangible elements in a service episode. Physical evidence is important in-service delivery because it is usually the only tangible clue that the customer has about the quality of the service experience. Thus, information services should pay attention to the presentation of staff, atmosphere, and ambiance, the design of premises, cleanliness, color palettes, tidiness, signage, heating, seating, accessibility, and lighting. In online environments, physical evidence is extremely limited. This is a very significant challenge in the marketing of digital information services since the absence of physical clue removes an important channel of communication with customers and for customers an important source of evidence on which to base their preliminary judgment. In multi-channel or hybrid environment physical evidence from the 'bricks' channel may be used to support impressions relating to online channels. Where this is not possible, other elements of the marketing mix, such as product and their attributes and branding, become more important.

The marketing-mix is an important tool in creating and maintaining an offering that is of value to customers. The success of marketing depends on the right mix. In other words, a product that lacks visibility amongst the potential customer group will fail; a marketing message that is not consistent with value that the customer perceives the product to offer will mean that the promise does not match the delivery; this will lead to dissatisfaction and may damage customers attitudes to the organization or the brand. All elements of the marketing mix are interdependent and must be consistent with one another. The most appropriate marketing mix depends upon the customer and is influenced by the marketing environment. An organization needs to design and combine elements of the marketing mix in such a way as to create an offering that differentiates it from its competitors and creates a competitive advantage.

The elements of the marketing mix can be changed. However, change to most of the elements of the marketing mix are constrained by the organization's existing resources (including its existing customer base), and the rate of change that is possible may at times be frustratingly slow. For example, library often occupies specific buildings; these are not always in the best locations to ensure the optimum of visits, but a new building must be negotiated over many years and through complex political processes.

Marketing as a philosophy and activity can make a significant contribution to the organization in the information industry, whether they are in the public or private sector. Marketing is defined as a social and managerial process that is about people and communication. Marketing is about everything that an organization does or says. The marketing concept or marketing orientation emphasizes the importance of understanding the benefits that customer seeks, and developing shared notions of value. This knowledge and understanding can act as the platform for the development of the organizations' offering. An extended marketing mix is a useful tool for describing the offer. The 7Ps of the marketing mix are the product, price, place, promotion, people, process and physical evidence etc (Rowley, 2006).

CONCLUSION

Libraries create more knowledge and benefits for our country with the help of Cloud Computing. The cloud environment is a highly developed network environment. The Cloud computing methods applied to digital libraries and it improves the utilization rate of resources to address the imbalance in development. The computer programs are available in the cloud and are being hosted by an outside party. This

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

means that end users or customers are not to worry about such things as storage and power and they can simply enjoy the end result.

In this research study, we discussed on Cloud computing, it benefits, the business shifting to the cloud, the safety of cloud, categories of cloud computing, how it works, who uses the cloud was also discussed. We also looked into a digital platform, digital library and elements of the digital library. We reviewed some related articles and also discussed users service model in the university library. Digital transformation, marketing of the information products and services, the categories of the products to be market, marketing skills in the library, marketing mix and the physical shreds of evidence were also looked into and discussed.

RECOMMENDATIONS

The following suggestions are made based on this research study

- A further practical investigation can be conducted on librarians' awareness of Library information science
- Readiness to change to ILS/LMS can be researched on with suitable technology adoption models.
- More aspects of cloud computing adoption in Libraries and digital platform can also be studied.
- Cloud computing should continue to be introduced to university libraries so as to have a new leap in the near future
- Cloud computing can make more extensive use to our work life, so we should engage the user in our day to day work life.

REFERENCES

Adegbilero-Iwari, I., & Hazmat, S. A. (2017). Library Services Platform Path to Cloud Computing Adoption in Nigerian Academic Libraries: A Review. *Library Philosophy and Practice (e-journal)*. Retrieved from https://digitalcommons.unl.edu/libphilprac/1658

Aymerich, F. M., Fenu, G., & Surcis, S. (2008). An Approach to a Cloud Computing Network. *1st International Conference on the Applications of Digital Information and Web Technologies*, 120-125. 10.1109/ICADIWT.2008.4664329

Banerjee, P. (2009). An intelligent IT infrastructure for the future. *15th International Symposium on High-Performance Computer Architecture*. *Proceedings*, *3*, 14–18.

Delic, K. A., & Riley, J. A. (2009). Enterprise Knowledge Clouds: Next Generation KM Systems. *International Conference on Information, Process, and Knowledge Management*, 49-53. 10.1109/eKNOW.2009.28

Dodda, R. T., Smith, C., & Moorsel, A. (2009). An Architecture for Cross-Cloud System Management. *2nd International Conference on Contemporary Computing*, 556-567

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

Eaton, B. D., Elaluf-Calderwood, S., Sørensen, C., & Yoo, Y. (2015). Distributed Tuning of Boundary Resources: The Case of Apple's iOS Service System. *MIS Quarterly: Special Issue on Service Innovation in a Digital Age*, *39*(1), 217–243. doi:10.25300/MISQ/2015/39.1.10

Fuentes, S. C. (n.d.). *Digital Library, An experience of access to Information*. Retrieved from http://creativecommons.org/licenses/by/3.0

Grossman, R. L., Gu, Y. H., Sabala, M., & Zhang, W. Z. (2009). Compute and storage clouds using wide area high-performance networks. *Future Generation Computer Systems-the International Journal of Grid Computing Theory Methods and Applications*, *25*(2), 179–183. doi:10.1016/j.future.2008.07.009

Hirata, H., Imai, K., Noguchi, M., & Asano, T. (2008). Acceleration of unified communications with NGN and SaaS. *NEC Technical Journal, 3*(3), 59-64. Retrieved from https://www.bigcommerce.com.au/ecommerce-answers/what-is-cloud-computing/

Juan-Quilis, V., & Muñoz-Gonzalez L. (n.d.). *New Challenges, New Skills for a Digital Library; Andalusian eHealth Library*. Consejeria de Igualdad, Saludy Politicas Sociales, Seville, Spain.

Kiesling, L. L. (2016). Implications of Smart Grid Innovation for Organizational Models in Electricity Distribution. In C.-C. Liu (Ed.), *Wiley Handbook of Smart Grid Development*. Hoboken, NJ: Wiley. doi:10.1002/9781118755471.sgd043

Klein, C., & Kaefer, G. (2008). From smart homes to smart cities: Opportunities and challenges from an industrial perspective, Next Generation TeletraffÕc and Wired/Wireless Advanced Networking, Proceedings. *Lecture Notes in Computer Science*, *5174*, 260. doi:10.1007/978-3-540-85500-2_24

Kotler, P., Keller, K. L., Koshy, A., & Jha, M. (2007). *Marketing Management: A South Asian Perspective* (12th ed.). New Delhi: Prentice Hall.

Lijun, M., Chan, W. K., & Tse, T. H. (2008). A tale of clouds: Paradigm comparisons and some thoughts on research issues. *IEEE Asia-Pacific Services Computing Conference, APSCC'08*, 464-469.

Mell, P. (2009). *Effectively and securely using the Cloud Computing Paradigm*. Retrieved January 9th, 2015 from http://csrc.nist.gov/groups/SNS/cloud-computing/cloudcomputing-v26.ppt

Mitchell, P. (2008). Learning architecture: Issues in indexing Australian education in a Web 2.0 world. *The Indexer*, *26*(4), 163–169. doi:10.3828/indexer.2008.50

Newton, J. (2009). *Are SaaS & Cloud Computing Interchangeable Terms*. Retrieved from http://www.daniweb.com/blogs/entry3993.html

Ojala, A., & Tyrväinen, P. (2011). Value Networks in Cloud Computing. *The Journal of Business Strategy*, *32*(6), 40–49. doi:10.1108/02756661111180122

Olabiyisi, S. O., Fagbola, T. M., & Babatunde, R. S. (2012). An exploratory study of cloud and ubiquitous computing systems. *World Journal of Engineering and Pure and Applied Sciences*, *2*(5), 148–155.

Parker, G. G., Alstyne, M. W., & Choudary, S. P. (2016). *Platform Revolution: How Networked Markets are Transforming the Economy and How to Make Them Work for You*. New York: WW Norton & Co.

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

Pon, B., Seppala, T., & Kenney, M. (2014). Android and the Demise of Operating System-Based Power: Firm Strategy and Platform Control in the Post-PC World. *Telecommunications Policy*, *38*(11), 979–991. doi:10.1016/j.telpol.2014.05.001

Praveena, K., & Betsy, T. (2009). Application of Cloud Computing in Academia. *IUP Journal of Systems Management*, *7*(3), 50–54.

Reuver, M., Bouwman, H., &Haaker, T. (2013). Business Model Roadmapping: A Practical Approach to Come from An Existing to a Desired Business Model. *International Journal of Innovation Management*, *17*(1), 1340006-1–1340006-18.

Reuver, M., Verschuur, E., Nikayin, F., Cerpa, N., & Bouwman, H. (2015). Collective Action for Mobile Payment Platforms: A Case Study on Collaboration Issues Between Banks and Telecom Operators. *Electronic Commerce Research and Applications*, *14*(5), 331–344. doi:10.1016/j.elerap.2014.08.004

Reuver, M. D., Sørensen, C., & Basole, R. C. (2017). The digital platform: A research agenda. *Journal of Information Technology*.

Rowley, J. (2006). *Information Marketing* (2nd ed.). London: Ashgate.

Ryan, M. D. (2012). Cloud computing privacy concerns on our doorstep. *Communications of the ACM*, *54*(1), 36–38. doi:10.1145/1866739.1866751

Sanchati, R., & Kulkarni, G. (2011). Cloud Computing in Digital and University Libraries. *Global Journal of Computer Science and Technology*, *11*(12).

Sethi, W. T., Alfakhri, A., Ashraf, M. A., Alasaad, A. G., & Alshebeili, S. (2017). *State-of-the-Art-Antenna Technology for Cloud Radio Acess Networks. (C-RANs). In Cloud Computing - Architecture and Applications* (J. Sen, Ed.)., doi:10.5772/67352

Svahn, F., Lindgren, R., & Mathiassen, L. (2015). Applying Options Thinking to Shape Generativity in Digital Innovation: An Action Research into Connected Cars. *49th Hawaii International Conference on System Science (HICSS 49)*, 4141–4150.

Tiwana, A. (2014). *Platform Ecosystems: Aligning Architecture, Governance, and Strategy*. Morgan Kaufmann. doi:10.1016/B978-0-12-408066-9.00001-1

Tuncay, E. (2010). Effective use of cloud computing in educational institutions. *Procedia: Social and Behavioral Sciences*, *2*(2), 938–942. doi:10.1016/j.sbspro.2010.03.130

ADDITIONAL READING

Al-Ruithe, M., Benkhelifa, E., & Hameed, K. (2018). Key Issues for EmbracingCloud Computing to Adopt a Digital Transformation: A Study of Saudi Public Sector. *Procedia Computer Science*, *130*, 1037–1043. doi:10.1016/j.procs.2018.04.145

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

Clohessy, T., Acton, T., & Morgan, L. (2017). The Impact of Cloud-Based Digital Transformation on IT ServiceProviders: Evidence from Focus Groups. *International Journal of Cloud Applications and Computing*, *7*(4), 1–19. doi:10.4018/IJCAC.2017100101

Kumar, D. A., & Mandal, S. (2013). Development of cloud computing in integrated library management and retrieval system. *International Journal of Library and Information Science*, *5*(10), 394–400. Retrieved from https://www.creatrixcampus.com/blog/10-benefits-using-cloud-based-library-management-system

KEY TERMS AND DEFINITIONS

Cloud Computing: This is the operation of using a system to remote servers hosted on the cyber-space to reserve, supervise and process data rather than a nearby server or a personal computer. Cloud computing is an information technology (IT) pattern that permits universal access to shared pools of arrangeable system resources and higher-level services that can be quickly prepared with very little management attempt, many times through the Internet.

Digital Platform: A digital platform is an established device erected on present-day cloud technology that makes the evolution of software or programs easy. It is, nevertheless, not a product in itself. The services, applications, and solutions on the platform are the products that you as a customer will interact with and pay for.

Digital Transformation: Digital transformation is the integration of digital technology into all domains of business, essentially altering how you function and administer value to customers or consumer. It's also a cultural change that necessitates organizations to constantly challenge the status quo, experiment, and get comfortable with failure.

Library and Information Science: Library and Information Science is a vocation that is filled up of people very keen on making a positive change in the world. Library and information science is a meta-discipline, extending what we bear in mind as traditional academic research disciplines (e.g., economics, biology, history, etc.).

Library Management Systems: LMS is also called an automated library system. It is defined as software that has been established to manage basic housekeeping function of a library. LMS helps to provide information on any book present in the library to the user as well as staff number. It also keeps a track of book published, given in return and added to the library.

Library Service Platform: The concept library services platform relates a kind of library resource management system with a set of properties that contrast substantially from the long-standing genre of the integrated or combined library system

Marketing Mix: This concept is defined as an amalgamation of features that can be powered by a firm (Enterprise) to affect customers to acquire its products. The marketing mix refers to the set of measures, or strategies, that a company applies to advance its brand or product in the market.

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

Chapter 6
Cloud Computing and Academic Libraries in Nigeria

M. T. Bashorun
University of Ilorin, Nigeria

K. T. Omopupa
University of Ilorin, Nigeria

Garba Dahiru
Abubakar Tafawa Balewa University, Nigeria

ABSTRACT

The advent of computers and other communication technologies led to major transformations in the way library services are rendered and the profession practiced. The libraries have been automated, networked, and are now moving towards paperless or virtual libraries. This chapter examines various facets of cloud computing, describes types and applications. It also outlines the benefits and challenges of cloud computing in academic libraries. Further, the chapter gives direction about the use of cloud computing services to the library professionals and academic libraries in Nigeria. This chapter may be helpful in generating cloud-based services for academic libraries. The chapter suggests that quality service assurance by cloud providers must be ensured, upgrading of internet bandwidth for fast access and quick information dissemination that would improve academic library services. It concludes that cloud computing is crucial and vital in modern information innovation, especially in academic libraries.

INTRODUCTION

Academic libraries are established in higher tertiary institutions such as universities, polytechnics, mono-technics, colleges of education, colleges of agriculture, institutes of technology and the like to play strategic role in complementing vision and mission of their parent body. The prime objective of any university is to provide world-class environment for learning, research and community service. This can only be achieved with the support of academic library that supports teaching, learning and community service. The primary responsibility of the Library is to select, acquire and organize books, periodicals,

DOI: 10.4018/978-1-5225-9034-7.ch006

Copyright © 2020, IGI Global. Copying or distributing in print or electronic forms without written permission of IGI Global is prohibited.

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

documents newspapers, and maps, other print and electronic resources that are required for teaching, research and self-development activities. Prior to application of Information and Communication Technologies (ICTs), the tasks in the libraries were performed manually and independently from one another. Such library services include collection development, cataloguing and classification, circulation and reference services, current awareness (CA), selective dissemination of information (SDI), interlibrary loan (ILL), information and referral service and other bibliographic services.

Advancement in ICTs has transformed the way information resources are stored and disseminated in all kinds of libraries and information centres. The application of ICTs in many activities in libraries has commenced. Recently, libraries all over the world have commenced the adoption of cloud computing into their various library activities. Cloud computing is a technology innovation that is enticing a great deal of attention amongst both academics and practitioners. Cloud computing, along with big data, is the biggest buzz of tech world these days. Just like Internet and Web took the world by storm in 1990s and early 2000s, and smart phones have transformed the new world order in communication in last decade (Walker, 2018). Similarly, cloud computing is expected to revolutionize the way in which organizational businesses would be conducted and services would be provided to potential subscribers/consumers. Libraries are not excluded from the huge benefits abound by the application of cloud computing into variety of library activities. According to Alzahrani (2016), cloud computing is a model for enabling convenient, on-demand network access to a shared pool of configurable computing resources. Resources such as, networks, servers, storage, applications, and services which can be rapidly provisioned and released with the little efforts from management or service provider interaction.

This chapter examines various features of cloud computing, describes types and applications. It also outlines the benefits and challenges of cloud computing in academic libraries in Nigeria.

BACKGROUND

Nowadays, emergency of Internet Technology (IT) has brought changes in the ways information is being access and share among the stakeholders. Cloud computing as a product of advanced ICT transforms the way system are built and services delivered, providing libraries with an opportunity to extend their impacts (Matt, 2010). In today's world, cloud-computing services are growing exponentially (Hickey& Rahmouni, 2010). This might be due to cloud computing benefits like cost saving, high storage capacity, universal accessibility, promoting effectiveness and efficiency. However, with the accrued benefits to cloud computing application, it seems, there is low adoption. Cloud computing is a style of computing where computing resources are easy to access, simple to use, cheaper to obtain and work faster with the availability of Internet connectivity. Cloud computing has been defined by many scholars (Hayes, 2008; Gartner, 2012). According to Hayes (2008), cloud computing is defined as a kind of computing which is highly scalable and use virtualized resources that can be shared by the users. Similarly, Gartner (2012) defined cloud computing as a style of computing in which massively scalable and elastic IT-enabled capabilities are delivered as a service to external customers using internet technologies. Therefore, cloud computing could be described as an internet based platform computing where virtual shared servers provide infrastructure, software, devices and other resources and hosting to subscriber on pay-as-you use basis. Cloud computing involves the subscriber and the provider. The subscriber is anyone who uses the services which can be referred to as a customer while service provider can be IT organization, a trusted third party or a combination of both. Several countries (UK, USA) began to develop and embrace cloud

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

computing, led by technology and innovation inclined companies. As supported by Omwansa, Waema and Omwenga (2014) who reported that many countries, led by the western nations have developed strategies to accelerate the adoption of cloud computing. Developing countries especially African countries and Nigeria in particularly will not be left out in exploiting the power of cloud computing technologies, this is possible, provided the right policies and investments are in place.

Globally, it seems that cloud computing has become one of the most flourishing technologies of the recent days. In support of this assertion, Alzahrani (2016) accentuated that cloud computing has potential to reach $204billion in 2016. Cloud computing benefits spread across all sectors and library as an organization was not left out. Application of cloud computing in library services could serve as a blessing to numerous library operations in order to accomplish their key objective towards library user's satisfaction.

The academic library plays a supportive role to ensure effective and efficient functions of learning, teaching, research and community services in such ways that endorsed institutional vision and mission. An academic library as the heart of the tertiary institutions attached to a higher education institution to serve three complementary purposes to support the school's curriculum, research of the university faculty, students and provide learning environment to the host community. Many major activities are carried out within the academic library such as collection, storage, organization; processing and analysis of information. Cloud computing technologies can immensely enhance these key activities taking place in the libraries. According to Tuncay (2010), library can benefit from using cloud computing technology by increasing computing performance, storage capacity, universal accessibility and cost reduction. Cloud computing is used in the library to put together a digital library and to computerize housekeeping operations using third party services, software and hardware (Padya, 2012). Correspondingly, Sasikala (2011) reiterated that cloud computing paradigm is quickly accepted as an alternative to traditional information technology (IT) because of the significant benefits, such as on-demand resources and low maintenance costs.

Now, it is obvious that cloud computing as a new concept is been added to comfort the practices in the academic libraries. There are various possible and unlimited areas in libraries that cloud computing could be applied such areas like Corporate cataloguing, Acquisition, File Storage, Searching Scholarly Content, Searching Library Data, Web Site Hosting, Building Digital Library/Repositories, Building Library Automation and Community Power. Despite huge benefits accrued with the application of cloud computing technology in Nigeria, its low adoptions still persist. In supporting the assertion, Ogunjobi (2015) reported that with series of efforts from prominent OEMs and SIs to promote cloud computing in Nigeria, uptake continues to be met with lukewarm reception, primarily fueled by fears that the data held in the cloud are not safe. Several studies (Adegbilero-Iwari & Hamzat, 2017; Hussaini, Vashistha, Garba & Jimah, 2017; Okwoli, 2015; Richard & Ahmad, 2013) examined the adoption and overview of cloud computing in Nigeria. However, it seems inadequate attention was paid to the cloud computing applications in academic libraries in Nigeria. Hence, this chapter examined the concept of cloud computing, its application and challenges in academic libraries in Nigeria and the way forward.

History of Cloud Computing

The idea of cloud computing technology has begun several decades. It was pioneered in the late 1959 and the foundation of cloud computing was laid by a noble computer scientist named Professor John McCarthy. He initiated the first project to use a time-sharing system which allows several people to use a single central computer at the same time. Ten years after (1969) another computer scientist identified

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

as J.C.R Licklider had a vision that everyone needs to be interconnected and accessing programmes and data at any site like cloud computing. Also, Licklider went ahead to develop an Advanced Research Projects Agency Network (ARPANET) which was the direct predecessor to the Internet. The following year, the full-time sharing solution was made available by the early 1970s with platforms as Multics (on GE hardware), Cambridge CT SS, and the earliest UNIX ports (on DEC hardware). In 1990, telecommunication companies saw the huge benefits on the trend of developments and began to offer virtual private network (VPN) services that enable business organisations to send and receive data across, shared or public networks as if their computing devices were directly connected to the private network. By 1997, Professor Ramnath Chellappa coined the networking with massive benefits of sharing to "cloud computing". In the year 2002, cloud computing was designed by Amazon, a leading e-business organisation, which had invested in a fleet of giant machines. The cloud computing was designed to handle heavy load of orders made on their site at the time of Christmas which could have caused downtime at their website during this period (Grossman & Gu, 2009). Subsequently, Amazon has invested heavily in this area and continues to grow its fleet and services. Just of recent, other players in the IT world such as Microsoft and Google, in turn, provide similar services. These cloud services offer enterprise customers of IT resources, data centre, hardware and software for virtualisation.

Status of Cloud Computing in Nigeria

Cloud computing is a general term for the delivery of hosted services over the Internet. The establishment and use of cloud based services in United Kingdom (UK) has seen an increase of 36 percent over a period of five years, with an adoption rate of 84 percent as of 2015. These services have a wide range of uses and that can reap many benefits. Especially IT companies experience improvements in anything from infrastructure cost reduction to easing collaboration among different teams. The statistic shows that the United Kingdom's (UKs) spent on computing services provided by small and medium sized enterprises. The UKs annual government spending on cloud computing services in 2013 was 45.3 million British pounds to 573 million British pounds in 2017 (Smith & Shirer, 2018). This shows high commitments on the part of UK government towards adoption and use of cloud computing technology. The UK was ranking 2nd overall and has an important market for US cloud vendors, who benefit from its developed economy. This development was as a result of good facilitating conditions and government supporting policies of UK government.

Similarly, United States Government as the world's largest consumer of information technology, spending over $76 billion annually on more than 10,000 different systems (Kundra, 2010). In September 2009, there was an announcement from US Federal Government's Cloud Computing Initiative that cloud computing has the potential to greatly reduce waste, increase data center efficiency and utilization rates, and also, lower operating costs. In addition, Federal budget guidance was issued to agencies to foster the adoption of cloud computing technologies. Towards the cloud computing adoption drive, US government inaugurated "The President's FY 2011 Budget" that highlights cloud computing as a major part of the strategy to achieve efficient and effective IT (NIST, 2010).

Slaheddine (2012) reported that cloud computing is suitable to the African continent by reason of the concentration of infrastructures, availability of IT competencies and ease of implementation. However, there is one prerequisite, which is to speed up the development of electronic communication infrastructures. Furthermore, Slaheddine (2012) reiterated that among the specific benefits of cloud computing in Africa, two in particular are liable to make a significant contribution to reducing the digital divide, namely:

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

1. The ability to have immediate access to the latest innovations;
2. The possibility for an organization to do away with heavy investment in infrastructure, particularly where computation centres are concerned, given the unreliability of the electric power supply in Africa.

Moreover, a survey carried out by Cisco (2013), revealed that 50% of South Africa's medium and large businesses were using cloud computing services, compared to 48% in Kenya and 36% in Nigeria. It is obvious that South Africa currently leads the continent in cloud computing adoption, but appears to not be growing fast enough to retain that position in the years to come. For a country like Kenya, in addition to the 48%, another 24% of organisations in Kenya were considering adopting within a short period. While cloud computing has received good reviews and huge acceptance in developed countries, backed up by the respective governments, the uptake of cloud computing in developing countries like Nigeria remains comparatively low as indigenous businesses find it difficult to overcome their reluctance and resistance towards having their technology assets hosted and managed by third parties and this course is also not being helped by other environmental factors either. As reported by Ogunjobi (2015) the reluctance and paranoia for cloud computing is all too common across most business sectors in Nigeria. The author cited an example, that it was estimated that well over 90% of Nigeria's Financial Services Institutions (FSI) are still deeply rooted in the belief of hosting and maintaining their own technological infrastructure, systems and applications as against key-into cloud services. However, the scenario is at variance with European countries, where almost 75% of the FSI have their technologies reside in the cloud, freeing up their capital for further investment in their business thereby reporting decent shareholders' value. Following the trend of the situation, Without doubt, Nigeria, like most African countries has some catching up to do.

LITERATURE REVIEW

Concept of Cloud Computing

Cloud computing is referred to by scholars as services provided remotely over Internet. Geczy, Izumi and Hasida (2012) gave comprehensive definitions of IaaS, PaaS and SaaS respectively. Geczy et al. (2012) defined cloud computing as comprising all the core infrastructure components of hardware, software and extra supporting elements which are provided as a service based on a pay-per-use rental model. The hardware components can refer to complete servers or server clusters; alternately it can be at an elemental level such as Central Processing Unit (CPU) time, networking infrastructure or data storage which provides capacity for storing data and associated services such as backups. Cloud computing offers users with a complete group of computing infrastructure resources that are deliverable as services through the Internet, irrespective of whether the underlying components and elements are virtualized or physical (Wang, Laszewski, Younge, He, Kunz, & Tao 2010).

Furthermore, Geczy et al. (2012) defined PaaS as the computing platforms and solutions that are provided as services; PaaS works much like cloud computing but it introduces an additional level of service functionality in the form of the computing platforms and solutions that reside on the underlying infrastructure. According to Lin and Chen (2012), PaaS is particularly suited to the development lifecycle from application design and development through to testing. Its offers a full or partial application

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

development environment that enabling developers to access computing resources for the application development. For various organisations, PaaS offers the ability to access the computing platforms and solution that are essential to effect extensive testing that would not otherwise be possible (Geczy et al., 2012).

Dhar (2012) defined SaaS as the highest level of abstraction in that it resides on top of the components. The elements introduced by cloud computing and PaaS makes available the functionalities of software systems which are provided over the World Wide Web as on-demand services (Dhar 2012). This layer of cloud computing service introduces a broad spectrum of applications and functionalities. This ranges from productivity applications such as customer relation management systems, content management systems and office productivity suites through to enterprise applications such as email services and social networking services (Wang et al., 2012). According to Alotaibi (2013), cloud computing refers to a new design to share electronic resources to produce and exchange information over the Internet providing the tools to process data and save them on network, return to it at any time. The National Institute of Standards and Technology(NIST), defines cloud computing as "a model for enabling convenient, on-demand network access to a shared pool of configurable computing resources at convenient (e.g., networks, servers, applications, storage, services and networks) that can be rapidly provisioned and released with minimal management effort or service provider interaction (Mitchell,2010). Therefore, cloud computing could be described as cloud service that promotes sharing of electronic resources and exchange information using the Internet platform.

Adoption of Cloud Computing Technologies

Cloud computing is a completely new innovation evolving technology in field of information technology. This technology emerged as a result of the developments in Internet and associated technologies. Cloud computing has colossal benefits yet its adoption in developing countries like Nigeria is low. Etro (2009) reported that the initial adoption of cloud computing solution started in the U.S. and followed by the countries of the European Union, and later by some developing countries including the most advanced Asian and Latin Americas. A recent survey was conducted by International Data Corporation (IDC) manufacturing insight (2012) revealed that the ease, speed as well as cost of reduction of IT staff are the key drivers for cloud adoption among manufacturers in Asia/Pacific Countries Excluding Japan (APEJ). Also, the findings showed that only 16% of the respondents surveyed listed these key drivers as forces for cloud computing adoption. In addition, the findings revealed that 59% of public sector respondents in Asia are confident that their IT departments have potential of deploying private cloud environments. Additionally, the findings showed that 69% of IT decision makers across the region indicated that they have budget assigned to cloud computing. Moreover, Yeboah-Boateng and Essandoh (2012) investigated cloud computing usage among small and medium enterprises in developing economies and findings showed that cost reduction on IT infrastructure and maintenance, improved communication, scalability and business continuity as the major drivers of cloud adoption.

Espadas (2013) examined the cloud computing advantages for offering on demand resources. The findings showed that there is still the need for certain automation when specific platforms are deployed and scaled over virtualized environments. This is the case of Software-as-a-Service (SaaS) platforms and their applications, where over and underutilization of resources occur due lower and higher workload pikes and because the number of virtual machine instances deployed for scaling applications are traditionally based on the maximum simultaneous users(Espadas, 2013). In this matter, a tenant-based

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

model is presented to tackle over and underutilization when SaaS platforms are deployed over cloud computing infrastructures. Further study was carried by Omwansa, Waema and Omwenga (2014) on the adoption state of cloud computing across African. The findings revealed that South Africa, Kenya and Nigeria are the leading countries in the use of cloud computing in Sub-Saharan Africa as of the year 2013. Oyeleye, Fagbola and Daramola (2014) examined the impact and challenges of the adoption of cloud computing by public universities in the South-west of Nigeria. A sample size of 100 IT staff, 50 para-IT staff and 50 students were selected in each university using stratified sampling techniques with the aid of well-structured questionnaires. Their findings revealed that the adoption of cloud computing has a significant impact on cost effectiveness, enhanced availability, low environmental impact, reduced IT complexities, mobility, scalability, increased operability and reduced investment in physical asset. In addition, the authors reported the major challenges confronting the adoption of cloud as data insecurity, regulatory compliance, lock-in and privacy concerns.

Also, in Nigeria, Dahunsi and Owoseni (2015) examined a critical analysis of the benefits and challenges posed by the adoption and usage of cloud computing. In addition, the study established the relationship between important stakeholders in the cloud ecosystem. The authors proposed methods of optimizing the benefits of cloud computing while reducing the challenges that might occur due to its adoption. Based on the trend of development in cloud computing with the accrued benefits that are bound with application of cloud computing, libraries in the world now appreciate the application of cloud computing to various library services available. Huang (2014) analyzed the library integration with cloud computing technology. The findings revealed that cloud computing plays a very important role in resource development and services for the library; it provides the sharing of hardware and software on the data storage, data management. Also, has the capability with the database resource sharing, unified digital resources, one-stop entrance, a full range of user interactive services, the expansion of the complex network applications and services. Additionally, Muhammed, Isma'il Zaharaddeen & Turaki, (2015) examined the benefits of adopting cloud computing and highlight the challenges in adopting and utilizing services offered by cloud computing. From their findings, recommendations were also made on how ease the adoption of the emerging technology in Nigeria.

According to Mark (2013), there are wide varieties of cloud computing services but the most likely to be useful to libraries and other organizations are Infrastructure as a Service, Platform as a Service and Software as a Service. Likewise, Rajan (2013) investigated evolution of cloud storage as cloud computing infrastructure service. The findings reported that there are three common types of clouds available namely, private, public and hybrid. The present book chapter further examines other types of clouds as discussed:

Types of Cloud Computing

Deploying cloud computing can differ depending on the requirements. There are four major types of cloud computing. They are:

1. Private Cloud

The cloud infrastructure has been deployed, and is maintained and operated for a specific organization (Tandon, 2014). The operation may be in-house or with a third party on the premises. This is typically designed and managed by IT unit within the organization. In private cloud, you own the servers, network

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

and the disk, and decide who gets to run on it with you. It is usually built specifically to provide internal service to an organization.

2. Community Cloud

The cloud infrastructure is shared among a number of organizations with similar interest and requirements. This may help limit the capital expenditure cost for its establishment as the costs are shared among the organization (NdukweIfeanyi & Chukwudi, 2013). The operation may be in-house or with a third party on the premises.

3. Public Cloud

The cloud infrastructure is available to the public on the commercial basis by cloud service provider. The public clouds enable a consumer to develop and display a service in the cloud with little financial outlay compared to the capital expenditure requirements normally applicable other deployment options (Moonis, 2016). In public cloud, you don't know who else is on the same servers, network or the disk that you are. This can be run by third party companies such as Amazon, Google and others. Public clouds are hosted off customer premises and usually mix applications(transparently) from different consumers on shared infrastructure.

4. Hybrid Cloud

The cloud infrastructure comprises of a number of clouds of any type, but the clouds have the ability through their interfaces to allow data and/or applications to be moved from one cloud to another (Richard & Ahmad, 2013). It made from more than one cloud deployment models that may be private, public, community and other models also, bound together with standardized or proprietary technology that enable data and the application portability. In hybrid cloud, you own some parts and sharing some parts, though in a controlled way. The hybrid model is commonly used by institutions and organizations because it is flexible and has more facilities that can make optimum use of their resources and accomplishing the tasks (Almajalid, 2017). All types of cloud computing has various types of cloud computing models as described in the next section.

Models of Cloud Computing Services

The models of cloud computing services are as follows:

1. Software as a Service (SaaS)

It is most widely used for cloud computing, it provides all the functions of a sophisticated traditional application to many customers and thousands of users, but through a Web browser, not a "locally-installed application". Little or no code is running on the Users local computer and the applications are usually tailored to fulfill specific functions. Application offered on-demand over the network. According to Adegbilero-Iwari and Hamzat (2017), library service platforms serves as "web-based, multitenant library

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

systems which operates largely as Software as a Service (SaaS) on the cloud computing architecture for the unified management and discovery of all kinds of library resources.

2. Platform as a Service (PaaS)

A computing platform is provided which supplies tools and a development environment to help companies build, test and deploy Web based applications (Marston, Li., Bandyopadhyay., Zhang & Ghalsasi, 2011). Here, developer platform built in-services The organization may not necessary need to invest in the infrastructure required for building Web and mobile application but can rent the use of platforms such as Microsoft Azure, Google Apple engine, and Force.com, Amazon.

3. Hardware as a Service (HaaS)

This type of cloud computing is sometimes referred to as Infrastructure as a service and it involves both storage services and computing power. It delivers utility computing capability, typically as raw virtual servers, on demand that customers configure and manage (Xu, 2012). Here Cloud computing provides grids or clusters of virtualized serves, networks, storage and system software, usually in a multitenant architecture. Basic storage and compute capabilities offered as a service (Amazon Web services, Microsoft's infrastructure service. According to Grant (2012), Library Service Platforms has been described as the future of library systems that are built upon the advances in architecture which allow for multi-tenant operation, data aggregation, analytics, and redundant and secure data centers in addition to integrated workflow approach which incorporates both print and digital processes and thus ensuring staff efficiency and effectiveness.

4. Communication as a Service (CaaS)

This service provides for certain messaging tools like voice over IP (VOIP), Instant messages (IM) and video conferencing.

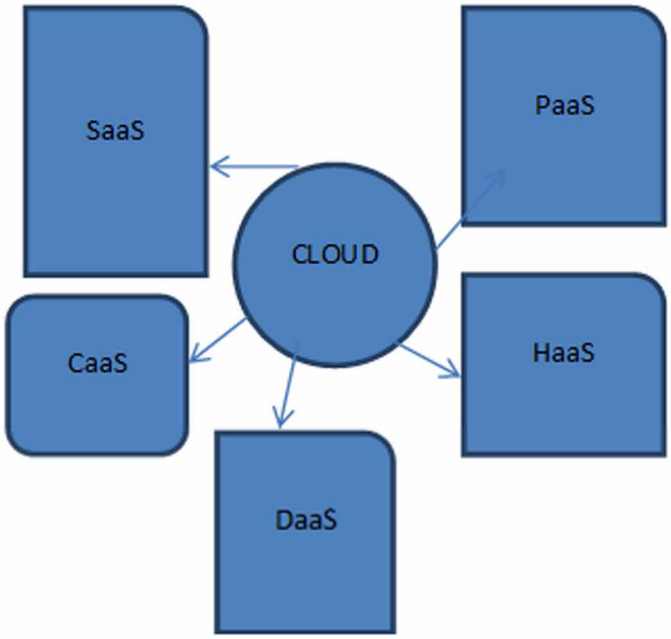
5. Desktop as a Service (DaaS)

This is provisioning of desktop environment either within the browser or as a terminal server.

Cloud computing models services can be benefitted in terms of software, platform, hardware, desktop and communication. However, Linthicum (2009) grouped cloud computing technology services into ten(10) major categories or patterns including: 1. Database-as-a-Service, 2. Storage-as-a-Service, 3. Information-as-a-Service, 4. Process-as-a-Service, 5. Platform-as-a-Service, 6. Integration-as-a-Service, 7. Application-as-a-Service, 8. Security-as-a-Service, 9. Management/Governance-as-a-Service, 10. Testing-as-a-Service. Nevertheless, common to all these services is that they 'rent' the use of computing resources including services, applications, infrastructures, and platforms to customers and these resources are accessed via the Internet (Geczy, Izumi & Hasida, 2012; Kumar, 2017).

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

Figure 1. Types or service of Cloud computing models
(Author's Self-Designed, 2018)



Characteristics of Cloud Computing

According to Stein (2010) while defining cloud computing and cloud services, he pointed out some characteristics of cloud computing as agility, application program interface, cost, device, reliability, scalability, performance, security, maintenances and susceptibility. Also, Yuvaraj (2013) pointed that the features of cloud computing include scalability, cost effectiveness, accessibility and lack of security as a principal factors in growth, abandonment and deferral.

In addition, the following can be considered as characteristics of cloud computing:

- **On-Demand Self-Service**: A subscriber can independently request for cloud computing capabilities, such as server time and network storage, using cloud service catalogues as needed automatically without requiring human interaction with each service's provider (Mell, 2011).
- **Multi-Tenancy:** A tenant is any application either inside or outside the enterprise that is need for service and exclusive virtual computing environment. This environment can encompass all or some select layers of enterprise architecture from storage to users interface. Hence, interactive applications have to be multi-user in nature. Multiple subscribers have access to their servers in the data center in an isolated manner (Jani, Kumar & Shah, 2013) Multi-tenancy is essential issue in cloud system, where the location of code and or data is mostly unknown and the same resource may be assigned to multiple users.
- **Self-Healing:** Any application or any service running in a cloud computing environment has property of self-healing. In case there is failure of the application, a hot back up application always ready to take over description.

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

- **Virtualized**: the application in cloud computing are fully planned from under lied hardware. It gets better utilization out of the resources they have; make them easier to managed saved money.
- **Ubiquitous Network Access**: This is characteristics by which end-user and server computing devices can be accessed over the network using the next geriatrists such as smart tablet (Amiribesheli & Bouchachia, 2018).
- **Service Oriented**: Cloud computing system are all service oriented which are independent of each other but combined together to provide this service.
- **Reliability**: its amazing feature of cloud computing. Reliability is one needed feature of cloud computing that will increase when redundant websites are accessed. Reliability is improved by having multiple sites for the same service (Sangeeta, 2013).
- **Consumption-Based Billing**: The capability to build up cost according to the actual consumption of resources is a relevant feature of cloud system. Hence, if you don't use the cloud resources and you will not pay for it.
- **Measured Service**: Cloud systems automatically control and optimize resource use by leveraging a metering proficiency at some level of abstraction suitable to the type of service (e.g., storage, processing, bandwidth, and active user accounts) used. Resource usage can be controlled, monitored and reported, promoting transparency for both the provider and consumer of the utilized service (Mell, 2011).
- **Security**: security is essential in all systems dealing with potential sensitive data and code. The cloud computing has a distinct featured that could be managed and administered by the team of IT experts for the security operation. Therefore, with the application of cloud computing, the data will be secured in terms of data loss and system crash.
- **Off-Premises:** The service is hosted and delivered from a location that belongs to the service provider. This usually has two implications: the service is delivered over the public Internet and the processing occurs outside the user's firewall. In other words, the server must cross both physical and security boundaries (Iwuchukwu, Atimati, Ndukwe & Iwuamadi, 2017).
- **Simplification**: Running many applications inside one would make it simple to understandable for users like sale force.com campy.
- **Wide-Ranging of Network Access**: Cloud computing resources are available over the network and accessed through standard mechanisms that enhance the use by heterogeneous small or big client platforms (e.g. mobile phones, laptops, and PDAs).
- **Elasticity**: Virtual machines resources can be increase or decrease on demand
- **Pay-Per-Use:** Charging for services that are not used are less possible. Hence, the client only pays for what is used.

APPLICATION OF CLOUD COMPUTING IN ACADEMIC LIBRARIES

A study carried out by Ghosh (2012) attempted to demystify the intricacies involved in cloud computing. Models of cloud computing and its effective implementation for mid-sized organization is emphasized. Adoption and use of cloud computing by academic libraries to provide qualitative services to their clienteles is possible by switching from acquisition and storage to services oriented system (Kaushik; Kumar; Rajasthan & Ambala, 2013).In same vein, Kaushik and Kumar (2013) identified key areas in libraries that can deploy cloud computing. These include: building digital repository, searching library

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

data, file storage, searching scholarly content, building community power and library automation. To buttress this assertion, Wada (2018) reported that academic libraries are adopting cloud computing for electronic journal access, hosting digital libraries/institutional repositories, tracking of statistical data and also integrating library hosting, and library automation (Singh, Sharma, Kumar & Yadav, (2016). With the current trend that led toon-demand computing, libraries and other organisations see an opportunity to reduce costs by maintaining minimal computing resources till when there is urgent need to increase them.

The following are the possible areas where cloud computing services and applications may be applied in academic libraries:

1. Building Digital Library/Repositories

The use of cloud computing in the library can be for building of digital libraries or librarian can develop institutional repositories. In connection to cloud based digital library software, Dura space is having two software's namely Dspace and Fedora Commons but Dspace is widely used for building digital libraries (Pyrounakis, Nikolaidou & Hatzopoulos, 2014).

2. Searching Scholarly Content

The cloud based research platform facilitates, discovers and shares the scholarly content. This stands for Knowledge Cloud which is dedicated to knowledge discovery and collaborative space for researchers and scholars.

3. Searching Library Data

OCLC is one of the best examples for making use of cloud computing for sharing libraries data for years together. For instance, OCLC World Cat service as the one of the popular services for searching library data is now available on the cloud. OCLC is offering various services pertain to circulation, cataloguing, acquisition and other library related services on cloud platform through web share management system.

4. File Storage

Cloud computing can be used to access any file on the internet. Cloud computing provides many services such as Flicker, Google Doc, Dropbox, jungle disk and sky Drive and so on. These services usually share the files on the web and enhance access to anywhere and anytime without any special software and hardware. Hence, libraries especially academic libraries can get advantages of such cloud based services for different purposes

5. Building Community Power

Cloud computing aids social networking services such as Facebook, Twitter, WhatsApp etc., which play a vital role in building community power. This cooperative effort of libraries will create time saving, efficiencies and wider recognition, cooperative intelligence for better decision making. It also, provides platform for innovation and sharing the intellectual conversation, ideas and knowledge.

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

6. Library Automation

Nowadays, many of software vendors such as EX-Libris, OSS Labs are also offering this services service on the cloud and third party services offering hosting of this service (SaaS approach) on the cloud to save libraries from investing in hardware for this purpose. Besides, cost-benefit, the libraries will be free from taking maintenance viz. software updates, backup and so on. More benefits of cloud computing will be discussed in the next section.

BENEFITS OF CLOUD COMPUTING TO ACADEMIC LIBRARIES

Cloud Computing can be applied to various areas in the academic libraries such as acquisition, digital library services and Online Public Access Catalogue (OPAC). It has several attractive benefits for users. Yuvaraj (2013) enlisted thirteen (13) benefits that libraries would optimize and derive by installing cloud computing through high computing power, high scalability, location and device independency, Less indulgence in library activities, Less maintenance, diverse support, unlimited storage capacity, faster deployment and development, greener library services, ubiquitous availability of library services, reduced technology obsolesce, pay-per-use, and no capital investment. Greengard (2010) reiterated that cloud computing technology enables individuals and organisations to rapidly connect to data, provision IT infrastructure and access sophisticated applications. In support of the above assertion, Okwoli (2015) affirmed that the biggest benefit of the adoption and use of cloud computing technology is that one does not "buy" the cloud as purchases for software and hardware and hitherto being made for library automation. Among the benefits of cloud computing are the following:

1. **Self-Service Provisioning**: End users can spin up computing resources for almost any type of workload on demand. For instance, it facilitates concentration and positions the resources from different sections in the library and disk space.
2. **Pay Per Use**: Computing resources are measured at a granular level, allowing users to pay only for the resources and work load they use. Tracking of usage of cloud computing for charging or billing, this is line with Erkoç and Kert, (2011) that reiterated that consumers pay for only what resources they use and therefore are charged or billed.
3. **Rapid Elasticity**: Libraries can scale up as computing need increase and scale down again as demands decrease. Hence, speed, scalability and performance of cloud service is the best for now.
4. **Hosted Tools**: Be cloud computing, the developers and tester need not to install, configure, run, or maintain tools on their system. Craig, Diana and Florence (2009) accentuated that cloud computing provides a way for businesses to increase capacity and quality without investing in new infrastructure, licensing new software or training personnel.
5. **Security:** It has highly secured infrastructure and faster provisioning of system.
6. **Ease to Back Up and Recovery:** With the simplicity of integration, it is convenient to back up. Also, flexible and robust in disaster data recovery.
7. **Low Maintenance and Save Cost**: The cloud computing is cost effective and it's requires little fund to maintain and reduces hardware. This is supported by Hussaini et al. (2017) who reported that one third party cloud computing vendor can manage the services of a library together with other satellite libraries thereby saving cost

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

8. **Environmental Friendly:** Cloud computing can be operated in any environment. . With the cloud, server capacity is shared between a numbers of businesses. For utilising the full capacity of your server, fewer machines are needed and less energy is wasted. Since the cloud works on a much larger scale, it can use more efficient layouts to keep servers cool.
9. **Unlimited Storage Facility:** Cloud computing can store large volume of data with 24/7 access (Alotaibi, 2013). As noted by Zanoon, Al-Haj and Khwaldeh (2017) that storing information in the cloud gives you almost unlimited storage capacity. Cloud computing support interlibrary loan service by enhancing the power of cooperating libraries through providing access and sharing of information resources with other developed libraries.
10. **Quick Deployment and Ease Integration:** With the simplicity of integration that simplified cost and consumption model. Cloud computing has the capability to ensure multiple simultaneous accesses to information.
11. **Reduces Ownership Cost:** The main benefits of a cloud is it effect on reducing ownership cost in organization and making use of organizational assets for expanding and innovating it services. This supported by Creeger et al. (2009) who asserted that using cloud can reduce total cost of ownership of infrastructure significantly.

In spite of huge benefits accrued from application of cloud computing services in the academic libraries, there are few challenges that need to be noticed in the application of cloud computing in academic libraries. This will be discussed in the next section.

CHALLENGES OF CLOUD COMPUTING IN ACADEMIC LIBRARIES, NIGERIA

Challenges are the constraints that work against effective and efficiency of cloud computing which are enormous. According to Neethu and Vanaja (2017) challenges in the cloud computing arena are many such as a constant power failure, low internet bandwidth, poor maintenance of computer set and lack of steady funding of library services. In same vein, Zanoon et al. (2017) reported that the security challenges in cloud computing environments fall under several levels: the network level which includes dealing with network protocols and network security such as distributed nodes, distributed data, and communications between the nodes; authentication level where the user handles encryption / decryption techniques, authentication methods such as contract administrative rights, authentication of applications and nodes, and logging entry; the data level which is concerned with data integrity and availability as well as data protection and data distribution. Among briefly discussed challenges are:

1. **Quality Issue With Cloud Service Providers:** The first and foremost challenges which cloud computing face are quality service by providers. Is there any way to ensure reliability and integrity of information sources? This is a serious question before libraries and network providers.
2. **Risk or Data Loss**: In the cloud model, service providers are responsible for maintaining data security and organizations would have to rely on them. Organisations are reluctant to buy an assurance of business data security from vendor. Also, all business applications have service level agreements that are strictly followed. Operational team plays a key role in management of service level agreements and runtime governance of applications. In production environments, operational teams support. Appropriate clustering fail over, Data replication, System monitoring (Transaction

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

monitoring, log monitoring and others), Maintenance (runtime governance), Disaster recovery, capacity and performance management. If, any of the above mentioned services is under-served by a cloud computer, the damage and impact could be severe. Storing information in the cloud could make the companies vulnerable to external hack attacks and threats; therefore there is always the lurking possibility of stealth of sensitive data (Apostu et al., 2013).

3. **Privacy and Security**: Information privacy and security are one of the essential issues for the cloud because of open environment nature with very limited user control.
4. **Power Failure:** It is a fact that power failure and unreliable supply of electricity from national grid has become a common feature of Nigeria. For effective usage of cloud computing, its required electricity power supply that serves as a platform for cloud computing.
5. **Low Internet Bandwidth:** Cloud computing requires stable and high internet bandwidth for effective connectivity. However, the Internet connectivity in Nigeria is slow due to low Internet bandwidth. Large numbers of institutions in developing countries have low bandwidth that is not good enough to download articles from e-journals. It was also noted by Arokia,and Shanmugapriyaa (2012),that access to cloud data is obviously limited by network output and latency, and despite of drastic improvements in Internet performance, it is still poor in comparison to local network storage.
6. **Cost of Investment**: The major barrier to entry into the cloud business was the cost of investment especially initial installation. This will invariably affects the cost of cloud services and discourage users.
7. **Time and Budget Constraint:** Generally, the education sector in the developing countries like Nigeria, of which academic libraries are part of, has been relegated to a low priority status over a long time. As noted by Ubogu and Okiy (2011) academic libraries derive their funds from the parent body, so if the financial situation of the institution dwindles, so is also allocation to the academic libraries. Most libraries are facing the challenges of financial constraint especially libraries that are not financially buoyant to subscribe to cloud computing services. Cloud computing involves spending on infrastructural setup, implementation and procurement of standard equipment which is capital intensive.
8. **Intellectual Property Rights (IPRs):** Managing IPR is another challenging problem that academic libraries have to encounter. Libraries require flexible license to create archival collections and to transfer contents to storage technologies (cloud computing) for preservation and dissemination legally. Considering the ease at which users can gain unauthorized access to the digital information, the legal liability to provide access is far greater difficulty than the products of print in nature. For all these functions, academic libraries need cost-effective, flexible, and easy- to-use software to manage access right and copyright.
9. **Unfavourable Policy:** regulatory and compliance restriction may be introduced by government in power. For instant, in some of European countries, government regulations do not allow customer's personal information and other sensitive information to be physically located outside the state or country (Popović & Hocenski, 2010). Having such an infrastructure may not always practicable and is a big challenge for cloud providers. Recently, Nigeria government came up with the term "hate speech" denying people of the information on atrocities committed by leaders at the corridor of power.

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

WAY FORWARD

Generally, the state of cloud computing application in academic libraries in Nigeria is very far from the realities of the digital era. As noted by Enefu, Gbaje and Aduku (2015) that Nigeria is coming along but at a slower pace; Be that as it may, the following are recommended as the way forward for the result-oriented application of cloud computing in academic libraries services in Nigeria:

1. **Provision of Third Party Services Within the Cloud:** Clients would prefer storage of data in a central location known as the cloud storage, where the data would be processed in anywhere on the server in order to build confidence on the clients, third have been tested as a party that would provide secured services in data security arena (Kubiatowicz, Bindel, Chen., Czerwinski., Eaton., Geels.,&Wells, 2000).
2. **Provision for Alternate Source of Power:** According to Hussaini et al. (2017) library should device other power backup's storage to help supplement power in case of power failure. Steady power supply will yield effectiveness and efficiency of cloud computing application in the academic libraries in Nigeria.
3. **Formulation of Good Policy**: Government should formulate policy that will ensure striving of cloud computing applications in academic libraries and other related organisations. The governments at all levels should come out strongly to welcome and support cloud computing technology. This would build users' confidence and accelerate adoption and use of the technology.
4. **Upgrading of Internet Bandwidth:** University management and other stakeholders should increase the internet connectivity to forestall delaying in uploading and downloading materials stored in the cloud computing. Doing this will make cloud computing services to be more attractive to potential users.
5. **Intellectual Property Right (IPR)**: Government should make adequate provision for IPR by incorporating IPR that will cater for cloud computing. Especially, libraries require flexible license to create archival collections and to transfer contents to storage technologies (cloud computing) for preservation and dissemination legally. The legal liability of the academic libraries to provide access should be flexible in nature.
6. **Minimize High Cost of Initial Installation of Cloud Computing**: The government should come out strongly to subsidize the cost of installation of cloud computing technology. This would increase user confidence and promotes adoption and use of the technology.
7. **Regular Training for Library Staff**: It is a wishful to think that cloud computing-based systems will manage themselves. The library IT department staff working in a cloud computing environment will continue to need individuals who understand the library's software applications and how the applications relate to the services available in the library. The current trend in ICTs requires that individuals who are working in IT today will need updated skills always in order to be pertinent to their employed organization.

FUTURE DIRECTIONS

There are no exclusive studies on user surveys of cloud computing initiatives in Nigeria. Hence, future studies in this area can focus on survey of users' adoption and use of cloud computing in academic

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

libraries services. Currently, librarians' views and responses to the use of cloud computing for storage and discharge academic library services are not considered by university management as this was not found in any of the above reviewed literature.

CONCLUSION

Obviously, all hands must be on desk to encourage widespread adoption and use of cloud computing in the Nigeria in order to tap into the endless benefits. This study provides cloud computing concepts, characteristics and benefits of cloud based on applications in academic libraries in order to enhance their services in a more well-organized fashion. It is not a gainsaying, that libraries are moving towards cloud computing technology in the present era and taking advantages of cloud based services especially in building digital libraries, social networking and information communication with diverse flexibilities. Cloud computing is the way of the future that offers the latest functionality. Storage and access to information should be our priority. It is therefore necessary that librarians and information related professions in developing countries like Nigeria brace-up to accommodate this positive development (cloud computing services) for the betterment of library services. Researchers have no reservation to affirm the correctness of this declaration by Malinga (2016) that over the next five years, Africa will see rapid growth in its cloud service adoption, with a forecast of 42% growth per year.

REFERENCES

Adegbilero-Iwari, I., & Hamzat, S. A. (2017). Library services platform path to cloud computing adoption in Nigerian academic libraries: A review. *Library Philosophy Practice*. Retrieved from https://digitalcommons.unl.edu/libphilprac/1658

Almajalid, R. (2017). *A survey on the adoption of cloud computing in education sector.* arXiv preprint arXiv:1706.01136

Alotaibi, M. S. (2013). Utilizations of cloud computing in library and information centers: A theoretical study. *International Journal of Digital Library Services*, *3*(4), 83–93. Retrieved from http://www.ijodls.in/uploads/3/6/0/3/3603729/dr._mish an_s._alotaibi_83-93.pdf

Alzahrani, H. (2016). A brief survey of cloud computing. *International Research Journal, 16*(3).

Amiribesheli, M., & Bouchachia, H. (2018). A tailored smart home for dementia care. *Journal of Ambient Intelligence and Humanized Computing*, 1–28.

Apostu, A., Puican, F., Ularu, G., Suciu, G., & Todoran, G. (2013). Study on advantages and disadvantages of cloud computing–the advantages of telemetry applications in the cloud. Recent Advances in Applied Computer Science and Digital Services, 118-123.

Arokia, P., Rajan, R., & Shanmugapriyaa, S. (2012). Evolution of cloud storage as cloud computing infrastructure service. *IOSR Journal of Computer Engineering*, *1*(1), 38–45. doi:10.9790/0661-0113845

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

Chu, C.-C. W., Yang, C. T., Lu, C. W., Chang, C. H., Chen, J. N., Hsiung, P. A., & Lee, H. M. (2012). Cloud computing in Taiwan. *Computer, 45*(6), 48–56. Retrieved 17th April, 2018from: http://ieeexplore.ieee.org/lpdocs/epic03/wrapper.htm?arnumber=6197169

Cisco. (2013). *The cloud in Africa: reality check 2013*. Retrieved December 13, 2013 from: http://www.cisco.com/web/ZA/press/2013/112813.html

Craig, E., Diana, M., & Florence, T. (2009). Cloud computing an overview. *MIS*, *641*, 6.

Creeger, M. (2009). CTO roundtable: Cloud computing. *Communications of the ACM*, *52*(8), 50–56. doi:10.1145/1536616.1536633

Dahunsi, F. M., & Owoseni, T. M. (2015). Cloud Computing in Nigeria: The Cloud Ecosystem Perspective. *Nigerian Journal of Technology*, *34*(1), 209–216. doi:10.4314/njt.v34i1.26

Enefu, O. M., Gbaje, E. S., & Aduku, B. S. (2015). The Adoption of Cloud Computing Technology for Library Services in the National Open University of Nigeria Library. *Information Manager (The)*, *15*(1-2), 22–32.

Erkoç, M. F., & Kert, S. B. (2011, June). Cloud computing for distributed university campus: A prototype suggestion. *International Conference on Future of Education*.

Espadas, J., Molina, A., Jiménez, G., Molina, M., Ramírez, R., & Concha, D. (2013). A tenant- based resource allocation model for scaling Software-as-a-Service applications over cloud computing infrastructures. *Future Generation Computer Systems*, *29*(1), 273–286. doi:10.1016/j.future.2011.10.013

Espadas, J., Molina, A., Jiménez, G., Molina, M., Ramírez, R., & Concha, D. (2013). A tenant- based resource allocation model for scaling Software-as-a-Service applications over cloud computing infrastructures. *Future Generation Computer Systems*, *29*(1), 273–286. doi:10.1016/j.future.2011.10.013

Etro, F. (2009). The economic impact of cloud computing on business creation, employment and output in Europe. An application of the endogenous market structures approach to a GPT innovation. *Review of Business and Economics*, *54*(2), 179–208. Available at http://econpapers.repec.org/RePEc:ete:revbec:20090204

Geczy, P., Izumi, N., & Hasida, K. (2012). Cloudsourcing: Managing Cloud Adoption. *Global Journal of Business Research*, *6*(2), 57-70.

Ghosh, S. (2012). *How Worthy is Cloud Computing for Libraries*. In 8th Convention PLANNER-2012, Sikkim University, Gangtok.

Grant, C. (2012). The future of library system: Library services platform. *Information Standards Quality*, *4*(24), 1–13.

Greengard, S. (2010). Cloud computing and developing nations. *Communications of the ACM*, *53*(5), 18–20. doi:10.1145/1735223.1735232

Grossman, R. L., & Gu, Y. (2009). On the varieties of clouds for data intensive computing. *IEEE Computer Society. A Quarterly Bulletin of the Computer Society of the IEEE Technical Committee on Data Engineering*, *32*(1), 44–51.

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

Hayes, B. (2008). Cloud computing. *Communication of the ACM, 15*, 9-11. Retrieved 22nd April, 2018 from: http://csrc.nistgov/organisations/fisseg/2009-conference/prelentational/fissea09-day3-cloudcomputing.pdf

Hickey, M., & Rahmouni, M. (2010). Modelling Cloud Computing Infrastructure. Lecture Notes in Computer Science, *6155*, 106-109.

Huang, X. (2014, May). Research on university library digital resources integration under the cloud computing. *2nd International Conference on Teaching and Computational Science. Shenzhen, China. DOI*, 10. 10.2991/ictcs-14.2014.22

Hussaini, S., Vashistha, R., Garba, A., & Jimah, H. (2017). Cloud computing in Nigerian university library system: An overview. *International Journal of Advance Research in Science and Engineering.*, *6*(8), 684–690.

International Telecommunications Union. (2012). *Cloud computing in Africa: Situation and perspectives. Telecommunications Development Sector*. Retrieved12th April, 2018 from http://www.itu.int/ITU-D/treg/publications/Cloud_Computing_Afrique-e.pdf

Jani, K., Kumar, B., & Shah, H. (2013). Degree of Multi-tenancy and its Database for Cloud Computing. *International Journal of Engineering Development and Research,* 168-171. Retrieved 21st August, 2018 from https://www.ijedr.org/papers/IJEDR1303035.p df

Kaushik, A., & Kumar, A. (2013). Application of cloud computing in libraries. *International Journal of Information Dissemination and Technology*, *3*(4), 270–273.

Kubiatowicz, J., Bindel, D., Chen, Y., Czerwinski, S., Eaton, P., Geels, D., ... Wells, C. (2000, November). Oceanstore: An architecture for global-scale persistent storage. *ACM SIGARCH Computer Architecture News*, *28*(5), 190–201. doi:10.1145/378995.379239

Kundra, V. (2010). State of public sector cloud computing. Washington, DC: Academic Press.

Lin, A., & Chen, N. C. (2012). Cloud computing as an innovation: Perception, attitude, and adoption. *International Journal of Information Management*, (51), 176–189.

Malinga, S. (2016). *African cloud adoption to grow at 42% a year*. Retrieved 12th August, 2018 from https://www.itweb.co.za/content/RWnpNgM2bV8MVrGd

Mark, D. R. (2013). *Cloud computing security: the scientific challenge, and a survey of solutions*. Retrieved 24th October, 2018 from http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.675.6453&rep=rep1&type=pdf

Marston, S., Li, Z., Bandyopadhyay, S., Zhang, J., & Ghalsasi, A. (2011). Cloud computing— The business perspective. *Decision Support Systems*, *51*(1), 176–189. doi:10.1016/j.dss.2010.12.006

Matt, G. (2010). *Winds of change: Libraries and cloud computing*. OCLC Online Computer Library Center. Retrieved 23rd April, 2018 from:http://www.oclc.org/cont ent/dam/oclc/events/ 2011/files/IFLA-windsof-change-paper.pdf

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

Mell, P., & Grance, T. (2011). *The NIST Definition of Cloud Computing*. National Institute of Standards and Technology. Retrieved August 2018, from http://crsc.nist.gov/groups/SNS/ cloud-computing/cloud-def-v15.doc

Mitchell, E. T. (2010). Cloud computing and your library. *Journal of Web Librarianship*, *4*(1), 83–86. doi:10.1080/19322900903565259

Moonis, S. M. (2016). Cloud computing for agent-based urban transportation system. *International Research Journal of Engineering and Technology*, *3*(3), 563–566.

Muhammed, K., Isma'il Zaharaddeen, K. R., & Turaki, A. M. (2015). Cloud computing adoption in Nigeria: Challenges and benefits. *International Journal of Scientific and Research Publications*, *5*(7).

National Institute of Standards and Technology. (2010). *Summary of NIST cloud computing standards development efforts*. Author.

NdukweIfeanyi, G., & Chukwudi, A.E. (2013). Cost Benefits of Cloud vs. In-house IT for Higher Education. *International Journal of Computer Science and Security*, *7*(1), 1–14.

Neethu, G. S., & Vanaja, M. N. (2017). Concept & Applications of Cloud Computing in Libraries. *International Journal of Trend in Research and Development,* 1-4. Retrieved 24th April, 2018 from http://www.ijtrd.com/papers/IJTRD8424.pdf

Ogunjobi, M. (2015). Barriers to cloud computing adoption in Nigeria. *The Guardian*. Retrieved fromhttps://guardian.ng/technology/barriers-to-cloud-computing-adoption-in-nigeria/

Okwoli, M. E. (2015). *Adoption of cloud computing technology for library services in National Open University of Nigerian Library* (Maters Thesis). Department of Library and Information, Nigeria, Ahmadu Bello University Zaria.

Oyeleye, C. A., Fagbola, T. M., & Daramola, C. Y. (2014). The impact and challenges of cloud computing adoption on public universities in Southwestern. *International Journal of Advanced Computer Science and Applications*, *5*(8), 13–19.

Padya, M. (2012). Cloud computing for libraries: A SWOT analysis. *8th Convention PLANNER-2012 IFLIBNET Centre*, 387-394.

Popović, K., & Hocenski, Ž. (2010, May). Cloud computing security issues and challenges. In *MIPRO, 2010 proceedings of the 33rd international convention* (pp. 344-349). IEEE.

Pyrounakis, G., Nikolaidou, M., & Hatzopoulos, M. (2014). Building digital collections using open source digital repository software: A comparative study. *International Journal of Digital Library Systems*, *4*(1), 10–24. doi:10.4018/ijdls.2014010102

Rajan, A. P. (2013). *Evolution of cloud storage as cloud computing infrastructure service.* arXiv preprint arXiv:1308.1303

Richard, O. C., & Ahmad, L. (2013). Cloud Computing and Its Applications in e -Library Services: Nigeria in Focus. *International Journal of Innovation, Management and Technology*, *4*(5).

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

Sangeeta, N. D. (2013). *Cloud computing and virtualization technologies in libraries*. Retrieved 24th October, 2018 from https://www.igi-global.com/book/cloud-computing-virtualization-technologies-libraries/77387

Sasikala, P. (2011). Cloud computing: Present status and future implications'. *International Journal of Cloud Computing*, *1*(1), 23–36. doi:10.1504/IJCC.2011.043244

Slaheddine, M. (2012). *Cloud computing in Africa, situation and perspective.* Regulatory and Market Environment Division IEE/BDT/ITU.

Smith, E., & Shirer, M. (2018). *Worldwide Public Cloud Services Spending Forecast to Reach $160 Billion This Year, According to IDC*. Retrieved 24th November 2018 from https://www.idc.com/getdoc.jsp?containerId=prUS43511618

Stein, L. D. (2010). The case for cloud computing in genome informatics. *Genome Biology*, *11*(5), 207. doi:10.1186/gb-2010-11-5-207 PMID:20441614

Subhulakshmi, R., Suryagandhi, S., Mathubala, R., & Sumathi, P. (2016). An evaluation on Cloud Computing Research Challenges and Its Novel Tools. *International Journal of Advanced Research in Basic Engineering Sciences and Technology*, *2*(19), 69–76.

Tandon, A. (2014). Implementing and developing cloud computing on web application. *International Journal of Computer Science and Mobile Computing*, *3*(2), 153–157.

Tuncay, W. (2010). *Effective use of cloud computing in educational institution*. Academic Press.

Ubogu, J. O. & Okiy, R. B. (2011). Sources of funds in academic libraries in Delta State, Nigeria. *Library Philosophy and Practice*.

Wada, I. (2018). Cloud computing implementation in libraries: A synergy for library services optimization. *International Journal of Library and Information Science*, *10*(20), 17–27.

Walker, A. (2018). *What Is Cloud Computing? Everything You Need to Know About the Cloud*. Retrieved 24th November, 2018 fromhttps://learn.g2crowd.com/cloud-computing

Wang, L., von Laszewski, G., Younge, A., He, X., Kunz, M., & Tao, J. (2010). Cloud computing:A perspective study. *New Generation Computing*, *28*(2), 137–146. doi:10.100700354-008-0081-5

Wang, W., Zeng, G., Tang, D., & Yao, J. (2012). Cloud-DLS: Dynamic trusted scheduling for Cloud computing. *Expert Systems with Applications*, *39*(3), 2321–2329. doi:10.1016/j.eswa.2011.08.048

Xu, X. (2012). From cloud computing to cloud manufacturing. *Robotics and Computer-integrated Manufacturing*, *28*(1), 75–86. doi:10.1016/j.rcim.2011.07.002

Yeboah-Boateng, E. O., & Essandoh, K. A. (2014). Factors influencing the adoption of cloud computing by small and medium enterprises in developing economies. *International Journalof Emerging Science and Engineering*, *4*(2), 2319–6378.

Yuvaraj, M. (2013). Cloud Computing Applications in Indian Central University libraries: A study of librarians use. *Library Philosophy and Practice*. Retrieved from http://digitalcommons.unl.edu/libphilprac/992/

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

Zanoon, N., Al-Haj, A., & Khwaldeh, S. M. (2017). Cloud computing and big data is there a relation between the two: A study. *International Journal of Applied Engineering Research*, *12*(17), 6970-6982.

ADDITIONAL READING

Marks, E. A., & Lozano, B. (2010). *Executive's Guide to Cloud Computing* (pp. 25–40). John Wiley & Sons Inc.

Omwansa, T. K., Waema, T. M & Omwenga, B. (2014). Cloud computing in Kenya: A 2013 baseline survey, University of Nairobi. School of Computing and Informatics (SCI) & Computing for Development Lab (C4DLab), 1-54

Raj, P. (Ed.). (2014). *Handbook of research on cloud infrastructures for big data analytics*. IGI Global. doi:10.4018/978-1-4666-5864-6

KEY TERMS AND DEFINITIONS

Cloud Computing: A style of computing in which enormously accessible and flexible IT-enabled skills are delivered as services to external customers using internet technologies as a platform.

Community Clouds: A cloud infrastructure that is shared among a number of organizations with common concern and requirements.

Hybrid Clouds: A cloud infrastructure comprises of various clouds of any type that may be private, public, community and other models also, bound together with standardized or branded technology that enable data and the application transferability.

Private Clouds: A cloud infrastructure that has been deployed, maintained and operated for a certain organization.

Provider: An organization or individual that offers cloud computing service to their customers with an acceptance of token charges.

Public Clouds: A cloud infrastructure that is available to the public on the commercial basis by cloud service provider with little financial outflow.

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

Chapter 7
Application of Cloud Computing Technologies in Academic Library Management: The National Open University of Nigeria Library in Perspective

Olaronke O. Fagbola
University of Ilorin, Nigeria

Ambrose E. Smart
National Open University of Nigeria, Nigeria

Babarotimi Opeyemi Oluwaseun
National Open University of Nigeria, Nigeria

ABSTRACT

Cloud computing is an umbrella term used to describe a category of sophisticated on-demand computing services. Libraries generally have been adopting cloud-based solutions for different services such as electronic journal access management, integrated library system (ILS) hosting, electronic databases, digital library hosting, and cloud OPAC. This chapter discusses how cloud computing technology tools can be deployed to ensure uniformity in library services and standard of information resources available to students at all the study centers spread across the six geo-political zones. The chapter concludes that cloud computing offers many opportunities for academic libraries, and especially for the NOUN Library.

DOI: 10.4018/978-1-5225-9034-7.ch007

Copyright © 2020, IGI Global. Copying or distributing in print or electronic forms without written permission of IGI Global is prohibited.

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

INTRODUCTION

The Internet through digital technology devices brought a lot of far reaching innovations, development and changes into the day-to-day operations of libraries generally, and academic libraries in particular. Essentially, academic libraries, which, majorly serve as the support base for teaching, research and community services in universities have moved from purely traditional to hybrid libraries and Information and Communication Technologies (ICTs) are been deployed massively and are serving as the driving force for library development and management. Undoubtedly, from a technological and access standpoint, a large portion of what a library does could be done in the cloud (Kiryakova, Angelova and Yordanova, 2015).

Cloud computing, an umbrella term used to describe a category of sophisticated, on-demand, cost saving and high availability computing services is a model that provides ubiquitous and convenient access to shared computing resources and merge computational power of different hardware devices that can be used by many (Guokoli and Ambili, 2014; Kamila, 2013; and Furht, 2010). Cloud computing is a style of computing in which dynamically scalable and often virtualized resources are provided as a service over the Internet (Tavluoglu and Korkmaz, 2014; Dhar, 2012). Hence, in cloud computing, customization and creation of a user-defined experience is the key element.

Principally, the basic idea behind cloud computing, an application service via the Internet is data sending, receiving, storing and dissemination whenever required by the user(s) (Waterloo University, 2010). Thus, in the cloud, information are stored and distributed via networks(Kamila, 2013).Consequently, with services offered by the cloud computing providers, user(s) use a variety of digital devices, including personal computers, laptops, smartphones and PDAs to access programs, storage and application development platforms over the Internet (Furht, 2010).Typical example of cloud computing service is E-mail services which are cloud-based and the sending and receiving are carried out by a Server while mails are stored off shore. Assuredly, the adoption of cloud computing technology by NOUNlibrary would go a long way to help it focus on its core mandate instead of focusing on technology to deliver the core mandate to clients.

Cloud computing technology and application are not new to libraries. For example, online databases, union catalogues (OCLC WorldCat, OPAC), electronic resources and library management software like KOHA, Liberty III are hosted in the cloud and are accessed as cloud applications. Factually, libraries today use cloud computing technology to enhance their services and operation by adding values, attracting users and for cost effectiveness (Kaushik and Kumar, 2013).Also, Corrado and Moulaison (2012) explained that cloud computing in the literary sense to a librarian entails library data and services hosted beyond the library walls and are only accessible via the Web with the aid of Internet. Consequently, Swain (2014) claimed that the adoption of cloud computing technology in library and information services brought a novel trend in the scheme of information provision and services and a great transformation in the way systems are built and services delivered, thus providing libraries with an opportunity to extend their impact to diverse patrons.

Equally, the availability of Internet access provides library users with viable alternatives of finding information using digital devices such as mobile phones, android, i-pad, i-phone, Tablets and Laptops amongst others rather than using the conventional/traditional libraries. Thus, without mincing words, with this revolution in library services delivery, it is advocated that management of academic libraries, especially the NOUN library management should be proactive with the operation and delivery of library service. This would go a long way to ensure that facilitators and students (open and distance learners) have unhindered access to quality library services regardless of their location.

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

In Nigeria, practising librarianship is quite demanding due to the pace at which technologies get obsolete, software deployed for library operations and services require constant upgrading and coupled with the reduction in the finances of academic libraries, assuredly, adopting cloud computing technologies (technology solution and resource sharing venture) application for academic library management would go a long way to assist and make library managers become more practical in the services they offer their patrons on a daily and regular basis.

According to the Nigerian Universities Commission (NUC), the regulatory agency in charge of university education in Nigeria, library support is germane to the open and distance learning environment and library services are essential support services for distance education students who access library, educational and information resources and services in various ways and remote places (Fagbola, 2016). Consequently, NOUN, a foremost institution in open and distance education in Nigeria was mandated by the NUC to ensure that a qualitative, uniform and comprehensive library service provision are made available to its student body in all its study centres scattered all over the country. In addition, NOUN through its libraries / learning resources unit is expected to make available for the use of its students, regardless of their location, educational materials and information resources of the same quality and standard. Thus, for NOUN in general and the management of NOUN Library in particular to fulfil this mandate as given by NUC, at the barest cost, cloud computing technology, a business approach must be effectively and efficiently deployed. The most important anticipated benefits of cloud computing in NOUN libraries is that: it will ensure uniformity of library services across the study centre libraries, ensure supporting and unified monitoring and dynamic deployment of information resources amongst others.

Today, business organizations and libraries are adopting cloud computing technology as a business approach because it has significant potentials and provides effective business opportunities. Thus, an academic library of NOUN Library status, a non-profit and service-based organization with centre libraries spread across the six geo-political zones of Nigeria stand to benefit greatly by adopting cloud computing technologies solution for its library's technological needs and infrastructural development. This would go a long way to impact positively on the library operations. Furthermore, embracing cloud computing technologies by the NOUN Library management would ensure that library services are enjoyed by its teeming population of students regardless of the size and remoteness of the study centre location. Undoubtedly, this would translate into the library having a wider coverage, servicing more students on far fewer physical servers, with big savings in library information resources, equipment, infrastructure, maintenance and energy costs and in the long run help NOUN fulfil the mandate of equitable library services at all its study centres scattered through the nooks and crannies of Nigeria as mandated by the NUC, hence, the motivation for this chapter and against this background that this chapter, essentially, presents an overview of cloud computing, its architecture and components, service delivery models, types of cloud environment, features of cloud environment, characteristics, application of cloud computing technology in academic library, benefits in academic library, benefits of cloud computing technology to NOUN library, uses of cloud-based application in academic library management disadvantages and security issues in cloud computing technology.

PROFILE OF THE NATIONAL OPEN UNIVERSITY OF NIGERIA

The National Open University of Nigeria (NOUN) was established in July 1983 by President Shehu Shagari's administration. However in 1984, the Act establishing the university was suspended by the

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

then military government. In 2002, President Olusegun Obasanjo's administration restored the Act establishing the university as an Open and Distant Learning (ODL) institution with the mandate to provide a functional, flexible, accessible, cost-effective education for Nigerians regardless of the status, age and location using information and communication technologies. The NOUN has many study centres spread across all the six geo-political zones of Nigeria. These study centres are categorized into three: main study centres, community study centres, and special study centres. The total number of study centres as at present stood at eighty-three (83). Forty seven (47) of which are main centres, twenty (20) are special centres comprising of Prisons and Government parastatals, and sixteen (16) are community centres.

The NOUN Library was established in 2007 as an Open and Distance Learning and Resource Centre/ Library with the headquarters in Lagos, Nigeria and other centre libraries spread across Nigeria. However, the headquarter Library moved to Abuja in 2016 with the relocation of the administrative headquarter from Lagos to its permanent site in Abuja. The focus of the Library management was to build a one-stop world-class virtual resource Centre/Library that can be easily accessed by NOUN facilitators and students across the six geo-political zones of Nigeria as mandated by the NUC, the body saddled with the responsibility of overseeing university education in Nigeria. Presently, apart from the headquarters' library, there are twenty two (22) other libraries in study centres spread across the six geo-political zones of Nigeria. The NOUN Library runs a hybrid library system with both electronic and physical collections in all the twenty-two (22) study centre libraries. These collections cover a wide range of subjects offered in the university.

CLOUD COMPUTING: AN OVERVIEW

Cloud computing is a computing paradigm where a large pool of computer systems are connected in private or public networks to provide dynamically scalable infrastructure for application, data and file storage (Harris, n.d). Similarly, Kaushik and Kumar (2013) described cloud computing as a kind of computing technology that facilitates the sharing of resources and services over the Internet rather than having these services and resources on local servers/ nodes or personal devices. In addition, Huth and Cebula (2011) remarked that cloud computing is a subscription-based service where networked storage space and computer resources can be obtained. In this respect, the cloud makes it possible to access information from anywhere and at any time as long as Internet connectivity is available.

According to Mitchell (2011), cloud computing is the act of storing, accessing and sharing data applications and computing power in cyberspace. While Lewis (2010) described cloud computing as a distributed computing paradigm that focuses on providing a wide range of users with distributed access to scalable, virtualized hardware and / software infrastructure over the Internet. Despite this technical definition, cloud computing is in essence an economic model for a different way to acquire and manage IT resources. Thus, with cloud computing, hardware and functionality traditionally installed and run in a local environment is now performed on the network, in the Internet cloud (Goldner, 2011).

Cloud computing is a virtual technology that contains features of different technologies including utility computing, grid computing, unified computing, Web 2.0, service oriented architecture amongst others (Lewis, 2010). In addition, Bhagawan and Chaudhuri (2014) described it is a tool used to make ICT related services available in a simplified manner, hiding the complexities of those services, without the user(s) really knowing and getting involved in the technicalities of how and what to do in providing the needed services. Consequently, cloud computing technology through virtualization, resource utiliza-

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

tion, resource maximization, adequate storage space, cost reduction, resource sharing, improved quality of service are guaranteed (Kiryakova *et al.,* 2015).

Equally, cloud computing can be referred to as the ability to use applications on the Internet, store and protect data while providing a service which may be e-mail, sales force automation and tax preparation amongst others (Sun Microsystem, 2009). It reported further that cloud computing can be using a storage cloud to hold application, business and personal data and the ability to use a handful of Web services to integrate photos, maps and global positioning system (GPS) information to create a mash up in customer Web browsers. In this regard, cloud computing technology deals with computation, software, data access and storage services that may not require end-user knowledge of the physical location and the configuration of the system that is delivering the services (Jadeja and Modi, 2012).

Essentially, the idea of cloud computing is based on a very fundamental principle of re-usability of IT capabilities and the difference that cloud computing brings compared to traditional concepts of 'grid computing', 'distributed computing', 'utility computing' or 'autonomic computing' is to broaden horizons across organisational boundaries (Harris, n.d.). Thus, all the information that a digitized system has to offer is provided as a service in the cloud computing model (Sahu, 2015). He explained further that user(s) can access these services that are available on the 'Internet Cloud' without having any previous know-how on managing the resources involved. Therefore, cloud computing is Internet-based computing where virtual shared servers provide software, infrastructure, platform devices, other resources and hosting to customers on a pay-as-you-use basis.

Undoubtedly, cloud computing is the delivery of computing as a service rather than a product. Thus, Hurwitz, Kaufman and Halper (2012) remarked that itis a method of providing a set of shared computing resources that includes applications, computing, storage, networking, development and deployment platforms as well as business processes. Kamila (2013) explained that cloud computing technology delivers applications with the help of Internet access from a Web browser while the business software and data are stored on Servers at a remote location.

Cloud computing is a practical approach to experience direct cost benefits and it has the potential to transform a data centre from a capital-intensive set up to a variable priced environment (Harris, n.d.). He explained further that that with the advent of cloud computing technology, the cost of computation, application hosting, content storage and delivery has reduced significantly. Consequently, there is a substantial benefit of investing in cloud computing technology. For example, it creates new avenues for organizations and businesses to offer services using hardware / software / platform of third party sources, thereby saving on cost and maintenance (Radha, 2015). Expectedly, cloud computing is enjoying great popularity in many other fields, influencing areas such as social networking, which can be exemplified by Facebook, Twitter services, WhatsApp, Google, Amazon and Microsoft amongst others (Cieplak and Malec, 2014).

Unarguably, the hallmark of cloud computing is the outsourcing of IT infrastructure via the Internet, which provides computing resources such as processor compute time and data storage on demand via a service provider rather than the organization maintaining its own hardware and software environment (Peters, 2010). In this respect, cloud computing application for library operations and management can transform the way systems are built and services delivered, thereby providing libraries with an opportunity to extend their impact (Sahu, 2015). In addition, cloud computing solution in the library would allow for the provision of IT infrastructure on a subscription model that may be difficult to acquire and manage otherwise as a result of dwindling funding accruable to libraries. Thus, today, cloud computing technology is been regarded as a tool and one of the most exciting developments ubiquitous among

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

technocrats and enthusiastic librarians' world over as a technology solution as well as resource sharing venture. However, this thus not emanate spontaneously. On this note, the next section discusses the cloud computing architecture.

CLOUD COMPUTING ARCHITECTURE

Cloud computing technology architecture essentially is the coupled components and sub-components that make the cloud work (Cloud Academy, 2018). Similarly, Kaefer (2010) explained that the cloud computing architecture of a cloud solution is the structure of the system, which comprises of on-premise and cloud resources, services, middleware and software components, geographical location, externally visible properties and the relationships between them. Essentially, cloud computing architecture ensures scalability, cost efficiency and meeting of legal and business requirements.

According to Gong, Liu, Zhang, Chen and Gong (2010), cloud computing is TCP/IP based high development and integrations of computer technologies such as fast microprocessor, huge memory, high-speed network and reliable system architecture. However, not all cloud computing systems will use the same user interface (Kaefer, 2010).In cloud computing architecture, all applications are controlled, managed and served by a cloud server. Its data is replicated and preserved remotely as part of the cloud configuration and a well-integrated cloud system can create nearly limitless efficiencies and possibilities. Thus, user(s) can access the cloud using a service on mobile digital device, personal computer, Laptop, iPad iPhone and Tablet amongst other. Generally, cloud computing architecture can be divided into two sections and are connected to each other through a network, usually the Internet. They are:

1. **Front End**: This refers to the visible interface that computer user(s)/client(s) encounter through web-enabled client digital devices. It consists of the client end hardware and software that helps to access the cloud network via a user interface such as a browser. The front end client software usually works as independent application.
2. **Back End**: This refers to the 'cloud' part of the cloud computing architecture. It comprised of all the resources required to deliver cloud computing services. The back end is primarily responsible for providing built-in security mechanism, traffic control and protocols. The framework is made up of hardware such as Servers, processors and an array of software that provides the crux of the cloud service (Hurwitz *et al.,* 2012). In addition, the back end may comprise of a number of bare metal servers, data storage facilities, virtual machines, security mechanism and services all built in conformity with a deployment model and as a unit responsible for providing a service (Cloud Academy, 2018).

Essentially, the invisible 'back end' of the network is made up of a group of machines that form the cloud. However, a central server does bulk of administration work, monitor traffic, allocate resources to satisfy the clients' demands and ensure that everything runs smoothly. All these are made possible through a set of rules called protocols with the help of a special kind of software called middleware which allows networked computers to communicate with each other. Most times, servers do not always run at full capacity, thus, leading to waste of unused processing power. However, through, the process of server virtualization (where in a physical server is divided into a number of virtual servers, with

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

each server running at maximum capacity), the need for more physical servers in the cloud computing framework is reduced drastically.

COMPONENTS OF CLOUD COMPUTING

Cloud computing is a model for enabling convenient, on-demand network access to a shared pool of configurable computing resources such as networks, servers, storage, applications, and services that can be rapidly provisioned and released with minimal management effort or service provider interaction. Components of cloud computing includes the following:

- **Clients:** These are the device that the end user(s) interact with to manage their information on the cloud. A cloud client consists of computer hardware and software which rely on cloud computing for application delivery, or may be specifically designed for delivery of cloud services. Clients are basically divided into three categories:
  - **Mobile Clients:** These are portable devices that work in a wireless network environment through Internet. Examples of mobile device include PDA, smartphone and iPhone.
  - **Thin Clients:** These are computers which do not have internal hard drives, but rather the server do all the work and then display the information.
  - **Thick Clients:** These are regular computers with internal hard disk. It uses web browser such as Firefox, Opera and Internet Explorer amongst others to connect to the cloud.
- **Services**: A cloud service includes products, services and solutions which are delivered and consumed in real-time over the Internet. Example of cloud service is Web services which can be accessed by other cloud computing components and software.
- **Data Centre**: This refers to a room full of server collection or a large room in a basement where applications subscribed to by user(s) are being housed. This could be accessed through the Internet.
- **Distributed Clients**: The servers don't necessarily have to be housed in same location. Often, servers are in dispersed geographical locations but to the cloud subscriber, the servers acts as if they are humming right away next to each other. This gives the service provider more flexibility in option and security.
- **Storage:** Cloud storage involves the delivery of data storage as a service, including database-like services, often billed on a utility computing basis.

CLOUD SERVICE DELIVERY MODEL

Cloud computing is defined to have several deployment service delivery models, each of which provides distinct trade-offs for agencies which are migrating applications to a cloud environment. Basically, cloud computing service delivery models can be grouped into three. They are:

- **Infrastructure as a Service (IaaS):** This refers to foundational cloud delivery services of computing resources in the form of virtualized operating systems, workload management software and hardware, networking and storage services that other cloud services sit upon (Hurwitz et al., 2012). IaaS is the fundamental element used by other cloud models. It is a model that allows

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

users to rent computing infrastructure and resources like servers, storage, software, networking equipment, the capacity of processing, delivery of operating systems, virtualization technology to manage the resources, data centre space and various utility software elements on request (Gong et al., 2010). Though, the provider of IaaS owns and maintains the equipment while users can install and use whatever software when needed and are responsible for managing applications and data (Huth and Cebula, 2011).

IaaS is the base of a pyramid with the infrastructure at the bottom. It provides flexibility and serves as the foundation upon which PaaS can be utilized to build value. It can also be used effectively to augment data centre services either to increase capacity when needed, replace aging hardware with cloud-based services or to provide on-going access to sophisticated services such as advanced analytics. For example, many organizations are using IaaS and PaaS linked together for development and operations process.

There are two types of IaaS:

- **Public IaaS:** In public IaaS, all that a user need is to simply sign-up to acquire the resources and when the user(s) no longer need the resources, they are simply removed. However, public IaaS does not respond fast to the constituent needs of the user(s).
- **Private IaaS:** In private IaaS, the IT organization or an integrator creates an infrastructure designed to provide resources on-demand to internal users and sometimes partners. At times, some customers bring their own tools and software to create applications. In private versions, IaaS respond faster to the constituents' needs of the user(s).
    - **Platform as a Service (PaaS)**: PaaS is the software used to develop, deploy, host, run and/or manage software application, a model for providing a development environment for creating and launching web and mobile applications. It includes support programs, compilers, code libraries, application programming interface and tool sets. PaaS is a foundational cloud delivery service model, the middle bridge that serve as a mechanism for combining IaaS with an abstracted set of middleware services, software development and deployment tools that allow the organisation to have a consistent way to create and deploy applications on a cloud or on-premises environment (Gonget al., 2010).

PaaS is at the centre and it is tightly integrated with IaaS services because it is utilizing the underlying infrastructure provided by the IaaS. A PaaS environment supports coordination between the developer and the operations organization, typically called DevOps. Usually, the focus of the developer is on business code while the platforms provides the rest (ensure non-functional properties (Hurwitz et al., 2012). A primary benefit of a PaaS environment is that developers don't have to be concerned with some of the lower-level details of the environment. However, because of the importance of the platform, many big companies want to grasp the chance of pre-dominating the platform of cloud computing as Microsoft does in personal computer time (Gong et al.,2010).

PaaS offers a consistent set of programming and middleware services that ensure developers have a well-tested and well-integrated way to create applications in a cloud environment. PaaS requires an infrastructure service, hence, hides the complexity of the underlying computing services from IT practitioners in order to streamline the application development life cycle and deployment process. It ensures the delivery of a computing platform, and/or solution stack as a service, facilitates deployment of applications without the cost and complexity of buying and managing the underlying hardware and software.

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

- **Software as a Service (SaaS)**: This is a business application created and hosted by a provider in a multi-tenant (shared) model. It sits on top of both a PaaS and foundational IaaS (Hurwitz et al., 2012). SaaS leverages the cloud in software architecture, often eliminating the need to install and run the application on the customer's own computer, thereby alleviating the burden of software maintenance, on-going operation and support. At times, organizations may even be using IaaS and PaaS to build actual SaaS services.

SaaS environment is a model that allows users to use different applications as hosted services, rather than installing them on local computers. It can be built directly on an IaaS platform. Furthermore, it offers diverse range of software applications and services which typically are not visible to end-users of a SaaS application (Huth and Cebula, 2011).

In this respect, all cloud environments are not equal and the choice of cloud service delivery model will influence the processes and activities that it would serve. However, the three service models are inter-related. For example, IaaS model facilitates IT specialists in maintaining hardware resources; PaaS interact with software developers (including software companies) while SaaS model serves mainly end users (including businesses). Hence, the need to understand the different types of cloud service delivery models available for the support of businesses, organizations and libraries in particular.

TYPES OF CLOUD ENVIRONMENT

Cloud an acronym for common location online utility demand is a ubiquitous platform that is user friendly, allows on-demand access to shared computing resources like storage, servers, networks, applications and services that are fast to launch and implement with minimum interference from management or services providers (Tavluoglu and Korkmaz, 2014). Basically, there are different cloud computing deployment models and clouds come in different versions depending on the needs of the organization / business. There are primarily two deployment models of cloud. These are the public clouds and the private clouds (Hurwitz et al.,2012). However, most organizations use a combination of private computing resources (data centres and private clouds) and public services as a hybrid environment which includes the following:

1. **Open Community Clouds:** This refers to a cloud environment that does not require any criteria for joining other than signing up and creating a password. These environments may be privately or publicly owned. Typical example of open cloud environment is an open community cloud like the social networking environments (Facebook, WhatsApp, LinkedIn and Twitter). In addition, there are also open community sites that enable individuals with a common interest to participate in online discussions. For example, there may be a community of professionals in a certain industry that want to share ideas. These open community sites generally involve a relatively simple sign-up process, although some of the more sophisticated sites request additional information from you. These sites also generally have a low level of security. Therefore, it is relatively simple for someone inside or outside the open community to penetrate a user's secure area. Also, these sites generally do not offer service level guarantees to the user. Sites that are advertisement-driven typically spend more effort on security and service level management.
2. **Controlled Open Mode:** This refers to commercial public clouds environments that are open for use by any one at any time, but these clouds are based on a pay-per-use model. Some public clouds

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

offer a higher level of service because they're true commercial environments. For example, a SaaS vendor that charges per-user-per-month (or per-year) is an example of this kind of environment. In addition, vendors can offer analytics as a service to customers on a per-use or per-task basis. Because companies offering commercial public clouds are providing a commercial service, they provide a higher level of security and protection than the open community sites. These services generally have a written service level agreement (SLA) - which is an agreement outlining the obligation of the provider to the consumer of the service.

3. **Contractual Open**: Here the user cannot simply create login credentials, provide a credit card and start using the service. Instead, the user actually signs a contract for service. The term can be as short as a month, or more typically a year. Public cloud vendors sometimes productize offerings. Vendors also offer public IaaS and PaaS public platforms that are based on a formal contractual basis. In this kind of environment, the expectation is for a high level of security, privacy and governance. These vendors provide a written SLA. Because of the service and security guarantees of this model, some customers may be willing to store critical data in the cloud.
4. **Private Clouds:** A private cloud which provides an environment that sits behind a firewall is a pool of common resources optimized for the use of the IT organization unlike the data centre. Here, all computing resources are accessed through secure network connections. A private cloud adheres to the company's security, governance and compliance requirements. There are two different types of private clouds:
    a. **Private Cloud:** A private cloud is usually owned and managed by a company for the benefit of its employees and partners.
    b. **Commercial Private Cloud:** A commercial private cloud resides in a vendor's data centre and provides a secure connection to the customer's other IT resources. This approach securely augments a customer's IT environment.
5. **Public Clouds:** This is the classic cloud computing model where users can access a large pool of computing power over the Internet (whether IaaS, PaaS and SaaS) (Woodford, 2018). Here, the cloud computing supplier have vast amount of computing power, which they share out between a large numbers of customers --- multi-tenant architecture. A public cloud is flexible and does not adhere to the company's security, governance and compliance requirements.
6. **Hybrid Cloud**: This type of cloud combines both private (security and predictability of the data centre) and public (flexibility) cloud services where one or several touch points are between the environments. A hybrid cloud is primarily based in a privately-owned and operated data centre, but it can shift some of its traffic and data processing requests to public cloud vendors (Peters, 2010). In some instances, companies use a combination of public and private cloud services. For example, a retail company may have a private cloud to support its highly distributed development.

FEATURES OF A CLOUD ENVIRONMENT

Fundamentally, the basis of cloud computing technology is to create a set of virtual servers on available vast resource pool and make it available to clients. Thus, any web-enabled digital device can be used to access the resources through the virtual servers with Internet connectivity (Gosavi, Shinde and Dhakulkar, 2012). However, irrespective of the cloud service delivery model adopted in an organization or a library, the following core capabilities are essential in the cloud environment:

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

- **Flexibility:** This is a key feature of a cloud environment in that it provides a platform which is designed to be elastic. Instead of an organization / a library purchasing, managing and maintaining a server environment, it can purchase computing on- demand thus, avoiding capital expenditures. For example, a library can use just the resources they need, when needed such as the users / customers provision resources like computing or storage resources, pay on a per-unit basis and when they no longer needs that resource, it stops paying, after which the resource is released back into the pool of resources. This helps libraries to avoid the cost of idle computing resources.
- **Self-Serving:** The term self-service is important in cloud computing. It is a way to ensure that the IT organisation can be responsive to business change when a developer of an application, for example, is able to use a browser or portal interface to acquire appropriate resources needed to build or operate an application. This just-in-time model is a more efficient.
- **User-Centric Interface:** Cloud interfaces are location independent and can be accesses by well-established interfaces such as Web services and Internet browsers.
- **Billing and Metering of Service Usage:** A cloud environment usually includes a built-in service that tracks the number of resources a customer uses as a way of measuring and metering a service. For instance, in a public cloud, customers are charged for units of resources consumed while in a private cloud, IT management may implement a charge back mechanism for departments leveraging services.
- **Pricing:** Cloud computing does not require up-from investment. No capital expenditure is required. Users pay for services and capacity as they need them.
- **Workload Management**: The cloud is a federated (distributed) environment that pools resources so they can work together. Making this happen requires that these resources must be optimized to work as though they were an integrated well-tuned environment comprised of a variety of workloads. A workload is an independent service or collection of code that can be executed. It's important in the cloud that workloads be designed to support the right task with the right cloud services. For example, some workloads need to be placed in a private cloud because they require fast transaction management and a high level of security. Other workloads may not be so mission critical and can be placed in a public cloud.
- **Management Services**: Many management services are mandatory for ensuring that cloud computing is a well-managed platform. Security and governance are key services to ensure that your applications and data are protected. Data management is also critical because data may be moving between cloud environments. All of these services have to be managed and monitored to ensure that an organisation's level of service is maintained.

CHARACTERISTICS OF CLOUD COMPUTING TECHNOLOGY

Cloud computing is a type of computing that relies on sharing computing resources rather than having local servers or personal devices to handle applications (Sahu, 2015). Thus, some of the essential and unique characteristics of cloud computing that demonstrate their relation to, and differences from, traditional computing approaches are:

1. **On-Demand Self-Services:** Cloud computing creates the illusion of infinite computing resources available on demand and it eliminates the need to make preliminary plans for their long-term sup-

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

ply. For instance, unilaterally, a consumer can access computing capabilities such as server time and network storage as needed automatically, without requiring human interaction with a service provider. Examples include computer services such as e-mail applications. Cloud service providers providing on-demand self-services include Amazon Web Services Microsoft, Google and IBM amongst others.

2. **Permanent / Broad Network Access:** In cloud computing technology, computing resources and capabilities are available anytime and anywhere over the network and are accessible through standard mechanisms (Web protocols) which promote use through heterogeneous thin or thick client platforms like mobile phones, laptops, tablets, workstations and PDAs as well as other traditional or cloud based software services.
3. **Resource Pooling:** This involves the pooling together of a cloud computing provider's computing resources using multiple-tenant model to serve multiple consumers. Here, different physical and virtual resources are usually dynamically assigned and reassigned according to consumer demand. In addition, there is a degree of location independence in that the customer generally has no control or knowledge over the exact location of the provided resources, but may be able to specify location at a higher level of abstraction (such as country, state or data centre). Examples of such resources include storage, processing, memory, network bandwidth, e-mail services and virtual machines. With cloud computing technology, private clouds tend to pool resources between different parts of the same organisation.
4. **Rapid Elasticity:** Cloud services can be rapidly and elastically provisioned, in some cases automatically, to quickly scale out and rapidly released to quickly scale in. while, to the consumer, the capabilities available for provisioning often appear to be unlimited and can be purchased in any quantity at any time.
5. **Measured Service:** Cloud computing resource usage (such as storage, processing, bandwidth or active user accounts) can be measured, reported and controlled. Thus, providing transparency for both the provider and consumer of the utilized service. As a matter of fact, cloud computing services use a metering capability which enables control and optimize resource use; the more you utilize, the higher the bill. Just as utility companies sell power to subscribers and telephone companies sell voice and data services, IT services such as network security management, data centre hosting or even departmental billing charged per usage metrics (pay-per-use) can now be easily delivered as a contractual service.
6. **Multi-Tenacity:** Cloud computing technology application supports multi-tenancy use (multiple tenants at the same instant of time). The system allows several customers to share the infrastructure allotted to them without any of them being aware of the sharing through the process virtualization. Available servers in the machine pool are allotted to the users in such a way that the privacy of the users or the security of their data is not compromised. To this end, cloud computing technology application is driven by policy, enforcement, segmentation, isolation, governance, service levels and charge back / billing models for different consumer constituencies. For example, consumers might utilize a public cloud provider's service offerings or actually be from the same organization, such as different business units rather than distinct organizational entities.

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

APPLICATION OF CLOUD COMPUTING TECHNOLOGY IN ACADEMIC LIBRARY MANAGEMENT

Information and Communications Technologies (ICTs) are cutting edge technologies used in academic libraries and these are playing very vital role in the area of information collection, storage, organization, processing and analysis. Similarly, cloud computing technology (technology solution and resource sharing venture) is been used for various purposes and for achieving economy in library functions, offers many interesting possibilities for libraries which may help to reduce technology cost, increase capacity reliability and performance for some type of automation activities in this era of paucity of funds (Gosavi et al., 2012). Equally, Peters (2010) confirmed that libraries are shifting their services with the attachment of cloud and networking with facilities to access these services anywhere and anytime. Thus, cloud computing solution has found application in the following area of librarianship:

1. **Library Automation:** Cloud computing technology application in libraries has save libraries from investing in hardware and other infrastructure for the purpose of library automation. Beside cost-benefit, libraries will be free from taking maintenance viz. software updates, backup and so on (Peters, 2010). For example, Polaris provides variant cloud-based services such as acquisitions, cataloguing, process system, digital contents and provision for inclusion of cutting-edge technologies used in libraries and also support various standards such as MARC21, XML and Z39.50.
2. **Digital Library/Repositories:** Libraries are adopting cloud-based solutions for different services in the area of digital library hosting (a digital library that developed by using any digital library software in connection to cloud-based digital library software), electronic journal access management, statistics tracking and integrated library system (ILS) hosting amongst others. All these have allowed libraries make strategic choices about allocation of resources and offer better services than would be possible if relying only on in-house solutions. For example, much of the focus on cloud computing in digital libraries has been on subscription service or platform (e.g. ILS hosting) and in the present situation, libraries needs a digital library to make their resources, information and services available at an efficient level to ensure access via the network.
3. **Sharing Library Data:** Web share management system are facilitating the development of an open and collaborative platform in which library can share their resources, services, ideas and problems with the library community on the clouds. For instance, OCLC is offering various services pertain to circulation, cataloguing, acquisition and other library related services on cloud platform through the web share management system.
4. **Website Hosting:** Libraries today have their own websites which are made possible through cloud technology application. For example, Google sites serves as an example of a service for hosting websites outside of the library's servers and allowing for multiple editors to access the site from varied locations.
5. **Searching of Scholarly Content:** Through cloud computing, discovery and collaborative space for researchers and scholars is guaranteed. It presents a collaborative platform through which researchers discover and share knowledge with peers and facilitate access to millions of Journal articles, patents and e-books, for the users' tagging, sharing and discussing of these contents with their peers.

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

6. **File Storage**: With the help of cloud computing technology, through services rendered by some organizations like Flicker, Google Doc and Sky Drive amongst others, access to any files on the Internet is guaranteed. These services virtually share the files on the web and provide access anywhere and anytime without any special software and hardware. Thus, academic libraries tap into these advantages of such cloud-based services for various purposes and digital preservation.
7. **Building Community Power:** Cloud computing technology offers great opportunities for academic libraries to build networks among the library and information science professionals as well as other interested people including information-seekers by using social networking tools. The most famous social networking services viz. Twitter, Facebook and Whatsapp plays a key role in building community power. This cooperative effort of libraries would create time saving, efficiencies and wider recognition, cooperative intelligence for better decision-making and provide the platform for innovation and sharing of intellectual conversations, ideas and knowledge.
8. **Access:** Cloud computing technology provides library patrons with unhindered access to more computing power and to new applications, at an attractive price, as well as enjoys the advantages of a self-service and self-managed environment. In addition, cloud computing fosters elasticity and seamless scalability of IT resources that are offered to end users as a service through the Internet medium.

Conclusively, cloud computing is a very robust technology that is helping academic libraries provide access to diverse services in a most cost-effective and flexible manner, allow users to make use of services such as real-time computation, data access, collaboration, resource sharing and storage to end-users without the need to know the physical location and configuration of the system that delivers the service and to improve on the creation and delivery of IT solutions..

BENEFITS OF CLOUD COMPUTING TECHNOLOGY IN ACADEMIC LIBRARY

Fundamentally, the basis of cloud computing technology is to create a set of virtual servers on available vast pool of computing networking resources, give to clients, whose access are guaranteed through any web-enabled digital device with Internet connectivity (Gosavi et al., 2012; Goldner, 2010). Consequently, lots of computer power and storage capabilities residing in the distributed environment of the cloud are harnessed and the capabilities of these resources are made available as a single entity and it can changed to meet the current needs of the user(s). Some of the benefits of cloud computing technology application to academic libraries include the following amongst others:

- Cloud computing provides connection between the library and its users wherever they happen to be, expanding its reach and role within the library community.
- Cloud computing encourages interaction between the library and its teeming users, in unique ways; this drives participation and enhances its overall importance.
- Cloud computing empower libraries to reinvent their offering and encourage lifelong learning today and well into the future.
- Cloud computing helps academic libraries take advantage of the current and rapidly emerging technology to fully participate in the Web information landscape.
- Increased visibility and accessibility of collections.

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

- Reduced duplication of effort from networked technical services and collection management.
- Streamlined workflows, optimized to full benefit from network participation.
- Allow for cooperative intelligence and improved service levels enabled by the large-scale aggregation of usage data.
- Make library environment greener by sharing computing power and other relevant IT infrastructure that are housed in the cloud, thus reducing carbon emission and footprint within the physical location of the library.

Basically, deploying cloud computing technology to deliver library resources, services and expertise at the point of need, within user workflows and in a manner that users want and understand would free academic library management from managing technology and thus, focus on collection development and building, improved services and innovation. In addition, the cloud computing model service delivery would encourage academic library management and their users to participate in a network and community of libraries by enabling them to reuse information and socialize around information. It can also create a powerful, unified presence for libraries on the Web and give users a local, group and global reach.

BENEFITS OF CLOUD COMPUTING TECHNOLOGY TO NOUN LIBRARY

Cloud computing is a way of providing various services on virtual machines, allocated on top of a large physical machine pool which resides in the cloud (Gosavi et al., 2012). Leveraging on all the advantages that cloud computing has to offer the NOUN Library, thus, the library would be able to fulfil the mandate of NUC at a very minimal cost when the total number of study centre libraries and their teeming and diverse users are considered.

In the area of cloud service environment, the NOUN library management can adopted a hybrid cloud environment which, primarily is based in privately-owned and operated data centre, but can shift some of its traffic and data processing requests to public cloud vendors on as needed basis (as the number of study centre libraries increase). This hybrid model would help NOUN libraries to maintain more control over the applications and data stores that contain sensitive, private information about patrons. More so, NOUN library can continually adjust and fine-tune the balance between the tight control of a private IT infrastructure and the flexibility and savings of cloud-hosted infrastructure. If reliability or security of one vendor becomes a concern, management will not be committed to one company or one model of computing services.

Undoubtedly, the benefits of adopting cloud computing technology solutions for library operations and management at NOUN are enormous and not limited to the following:

1. **Resource Sharing:** Cloud computing technology would promote the use of shared resources among different library users at the various study centre libraries, thus, costs on information resources acquisition will reduce drastically. Also, cloud computing will help in e-learning by providing many services online for our unique set of students been an open and distance learning environment.
2. **Cost Savings:** In this era of shrinking budgets, its gets harder for libraries with each passing year to justify the purchase and maintenance of servers and electronic database subscription that aren't in use almost all the time. In this respect, cloud computing can offer price savings due to economies of scale and the fact that management will only paying for the resources actually used. Thus,

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

cloud computing can be financially advantageous and rewarding for the NOUN libraries as it will provide avenue for the management to as pay-per-use for whatever service and thus reduce significantly spending on local IT services and software. Equally, the cloud can reduce infrastructure costs (decrease the consumption of hardware or software resources immediately and in some cases automatically) from the library budget, leaving more staff time for creativity and innovation.

3. **Flexibility and Innovation:** Irrespective of size, NOUN libraries can take more risks when it comes to creative and innovative technology ideas where new application will run on external infrastructure supplied by another organization. Hence, instead of NOUN library as an entity purchasing, managing and maintaining a server environment in each of the study centre libraries spread across the six geo-political zones; it can purchase computing on-demand thus, avoiding capital expenditures. Assuredly, the creation and configuration of new virtual server is fast and easy in the cloud, thus, the library management need not bother to decide between devoting their limited server resources to the OPAC overflow traffic and a new mobile web application that is to be introduced. If both are hosted in the cloud, the resources devoted to each would shrink and expand as traffic rises and drops. In essence, cloud computing give room for innovation and flexibility.
4. **Building community power:** Cloud computing technology offers great opportunities for the NOUN library in that it would help in building networks and community power among the library and information science professionals. This cooperative effort of NOUN study centre libraries and librarians will create time saving, efficiencies, wider recognition and cooperative intelligence for better decision-making and provide the platform for innovation and sharing intellectual conversations, ideas and knowledge among other interested people including information-seekers by using social networking tools like Twitter, Facebook and WhatsApp amongst others.
5. **Sharing Library Data:** Web share management system are facilitating the development of an open and collaborative platform in which libraries can share their resources, services, ideas and problems with the library community on the clouds for instance, OCLC is offering various services pertain to circulation, cataloguing, acquisition and other library related services on cloud platform through the web share management system. The NOUN libraries can benefit greatly from this.
6. **Searching of Scholarly Content:** Cloud computing presents a collaborative platform through which researchers and academics discover and share knowledge with peers and facilitate access to millions of Journal articles, patents and e-books / Journals, for the users' tagging, sharing and discussing of these contents with their peers. Thus, through the adoption of this technology by the NOUN library, discovery and collaborative space for researchers, academic staff, facilitators, courseware developers, teeming student population of NOUN scattered across study centres in all the geo-political zones is guaranteed.
7. **User-Centric Interface:** Cloud computing support portability since the services is available over the web and can be accessed through a web browser from any part of the world. Hence, adopting cloud computing technology in managing NOUN library operations would ensure that all the study centre libraries have access to the information resources stored in the cloud by NOUN library management through well-established interfaces such as Web services and Internet browsers regardless of where the user(s) are located.
8. **Billing and Metering of Service Usage:** A cloud environment usually includes a built-in service that tracks the number of resources a customer uses as a way of measuring and metering a service. For instance, in a public cloud, customers are charged for units of resources consumed while in a private cloud, IT management may implement a charge back mechanism for departments leverag-

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

ing services. Thus, subscribing to cloud computing technology for the operation of the headquarter library and all the study centre libraries would help NOUN library management have a track record of the number of resources used by each study centre libraries and their patrons and have an overall idea of the total number of resources consumed generally on a yearly basis and use the information for planning.

9. **Scalability:** Cloud computing provides resources and services for users and are scalable over several data centres. Also, the pay-as-you-go feature allows a more efficient control of expenditures especially for subscription databases. In this respect, this unique feature of cloud computing will assist NOUN library management to make payment only for resources and services consumed by the libraries and its users thereby control its expenditures.
10. **Pricing:** Cloud computing does not require up-front investment. No capital expenditure is required. Users pay for services and capacity as they need them.
11. **On-demand Self-Services:** Cloud computing creates the illusion of infinite computing resources available on-demand and it eliminates the need to make preliminary plans for their long-term supply. For instance, unilaterally, NOUN with it consortium of libraries can access computing capabilities such as server time and network storage as needed automatically, without requiring any human interaction with any of the service providers. Examples include computer services such as e-mail applications by Google.com, Amazon Web Services Microsoft and IBM.
12. **Permanent / Broad Network Access:** Computing resources and capabilities are available anytime and anywhere over the network and are accessed through standard mechanisms (Web protocols) which promote use by heterogeneous thin or thick client platforms like mobile phones, laptops, tablets, workstations and PDAs as well as other traditional or cloud based software services.
13. **Multi-Tenacity:** Cloud computing application supports multi-tenancy (multiple tenants at the same instant of time) through resource pooling. The system allows several customers to share the infrastructure allotted to them without any of them being aware of the sharing. This is done by virtualizing the servers on the available machine pool and then allotting the servers to multiple users in a way that the privacy of the users or the security of their data is not compromised. NOUN Library with it multiple libraries scattered across study centres, this feature will allow several customers to share the infrastructure allotted to them without any of them being aware of the sharing through the process of virtualization.
14. Cloud computing services are agreement driven such that when the system experiences peaks of load, it would automatically adjust itself so as to comply with the service-level agreements. The services will create additional instances of the applications on more servers so that the load can be easily managed. Scalability and availability issues cause clients to break these agreements. This arrangement would benefit the NOUN library greatly.
15. Data storage in cloud is a main function of libraries, particularly those with digital collections storing large digital files can stress local server infrastructure. The files need to be backed up, maintained and reproduced for patrons. This can strain the data integrity as well as monopolise available bandwidth. Thus, transferring data to the cloud may be a novel development for some library professionals. It is believed that libraries would have some control over their data or collections. However, cloud computing technology adoption would support faster retrieval for request since IT infrastructure that exists remotely, often give users increased capacity and less need for updates and maintenance.

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

16. Cloud computing will allow for adjustable storage. For example, in the traditional library system, if the server is less than what is required, it can be replaced with a new one but with cloud computing technology, the storage capacity can be adjusted according to the needs of the library, since the storage is controlled by the service provider.
17. Through cloud OPAC, NOUN libraries can display their catalogue on the local server, this will assist study centre librarians and users in finding and determining the exact location of diverse library materials and through this, libraries that need such book can request for it for their user(s) through intra library loan whenever such a need arise.

In conclusion, the benefit of cloud computing technology applications in NOUN Library management is enormous. Cloud computing technology is a tool and one of the most exciting developments ubiquitous among librarians' world over as a technology solution as well as resource sharing venture. In this respect, the cloud can help to support increased collaboration between NOUN headquarter library and its study centre libraries and librarians; assist the headquarter library in the management of many common challenges of the library such as scarce resources, increased user demand and much more.

USES OF CLOUD-BASED APPLICATION IN ACADEMIC LIBRARY MANAGEMENT

Cloud computing is a unique utility service because it provides concrete opportunity for making a flexible use of technology, focus on service delivery and the consumer utilization model (Buyya and Sukumar, 2011). Cloud computing is also a resource pooling technology for accessing infinite computing services and other IT related resources per user demand. Thus, it can be compare with other utility service model such as electricity consumption, Internet access and cable TV amongst others models of pay-as-you use (Kaushik and Kumar, 2013). Consequently, there are various uses and examples of cloud computing in academic library management. They include the following:

- Cloud computing technology made e-mail communication and e-mailing of documents to friends, family, colleagues and superiors within or outside the library possible anywhere irrespective of location as long as Internet access is available through the mobile WiFi-enabled digital devices.
- Downloading of files onto memory stick, sending submissions by mail were made possible through cloud computing technology. For instance, there is a Google app, Google wave that allowed groups of people to work on the same document, generate idea, create a document in real-time or whenever convenient for participants;and then invite comments from others, amend, offer opinion(s), or otherwise and join in with the creation of the final draft.
- Unhindered access to remote electronic databases (EBSCOhost, Hinari), e-Books (E-brary), other e-Resources and many more in the comfort of our homes, offices and libraries were made possible with cloud computing technology.
- Access to different library portals locally and internationally in the comfort of our homes, office was all made possible with cloud computing technology.
- Online marketing of library information products and services, acquisition of information resources amongst others were made possible through cloud computing technology that Libraries subscribed to.

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

- Cloud computing technology provide avenue through which academic libraries can improve their services and relevance today. It can bring several benefits for libraries and give them a different future.
- With information explosion and increase in information usage, the cloud environment is surely a convenient platform for information storage using a common server and such information are made available to the users whenever required via web-based systems.
- Social networking websites like Web 2.0, Facebook, Linkedln, WhatsApp and search engines (Yahoo, Altavisa) use the concept of cloud computing in service delivery to their clients among which are libraries and their diverse patrons.
- In addition, cloud computing architecture can be used to provide flexible e-book/document lending service through in-library hardware to library patrons
- Users can search library catalogue through the touch-based terminals and books selected would be checked out to users along with e-readers.
- Users can borrow digital books with their mobile devices, iPads and android based tablets.

Unquestionably, cloud computing is becoming a mandatory technology for organizations because it has significant potential and provides effective business opportunities for organisations that adopted this approach at a very minimal and affordable cost to them.

DISADVANTAGES OF CLOUD COMPUTING TECHNOLOGY

Principally, the cloud provides many options for the everyday computer user as well as large and small businesses. It opens up the world of computing to a broader range of uses and increases the ease of use by giving access through any Internet connection (Huth and Cebula, 2011). Furthermore, cloud platforms enable organisations to use external expertise and resources to deliver complex services, remove the need for organizations to invest in server infrastructure, and lower the cost for organizations seeking elastic computing resources (Reddy, 2012). However, irrespective of the benefits / advantages of cloud computing technology solutions to business organizations and especially to academic libraries, the following are some of the disadvantages of the novel concept.

- The possibility of service interruption due to power outages.
- Libraries not having the knowledge base for selecting, implementing and managing these services.
- **Privacy and Reliability:** Storing of data on servers over which the library have no ownership or control is a big problem due to issues such as confidentiality, theft or outright loss.
- **Security and Data Protection:** The cloud is a big target for malicious individuals and can be accessed through an unsecured Internet connection. Data stored up in the cloud may be compromised. Therefore, businesses and organisations deploying all their information to remote locations shared with other users are doing so at a risk. However, in spite of the fears and contrary to the expectations, data in clouds are often better protected than when stored on local company's servers and maintained by internal IT departments.

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

SECURITY ISSUES IN CLOUD COMPUTING TECHNOLOGY

Cloud computing technology opens up a new world of opportunities for businesses and organizations, but mixed in with these opportunities are numerous security issues which must be considered before committing to a cloud strategy. In computer parlance, security refers to techniques for ensuring that data stored in a computer are nor read or compromised by any individual(s) without authorization (Bharathi, 2018). Cloud computing security issues can be grouped into three: data protection (securing the organization's data); user authentication (limiting access and monitoring) and disaster and data breach contingency planning. Some of identified security issues are highlighted below:

- Abusive use of cloud computing resources.
- Privileged access and malicious insiders.
- Shared technology and data segregation.
- Identity or service theft.
- Data loss.
- Geographical location of data and its recovery.
- Regulatory compliance in cloud computing.
- Stability of the cloud provider.

FUTURE RESEARCH DIRECTIONS

This chapter so far has examined through review of literature covering cloud computing technology in academic library management with special focus on the National Open University of Nigeria Library. Future researcher should consider empirical investigation of similar study with particular reference to conventional university's academic library management so that outcomes could serve as model that can be adopted by universities for the management of their libraries

CONCLUSION

Deploying cloud computing technology in academic libraries is not new in advanced nations of the world. However, it is still evolving. Cloud computing offers many opportunities for academic libraries, especially, the National Open University of Nigeria Library. This paper provides cloud computing concepts and implications of cloud based applications in libraries with focus on the National Open University of Nigeria Library in order to enhance their services in a more efficient manner. No doubt, libraries are moving towards cloud computing technology in present time and taking advantages of cloud-based services especially in building digital libraries, social networking and information communication with manifold flexibilities but some issues related to security, privacy, trustworthiness and legal issues were still not fully resolved. The paper concludes that the cloud computing technology, a technology solution and resource sharing venture would enhance and encourage NOUN Library management, its study centre libraries, librarians and their users to participate in a networked and community of libraries by enabling them to re-use information and socialize around information, use it to promote and market library information products and services.

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

RECOMMENDATIONS

Providers of cloud computing technologies solution would agree that deploying cloud computing technologies for academic libraries operations and services is still a new phenomenon in the entire African region. However, cloud computing solutions in academic libraries is now a reality which may not be wished away considering the drastic reduction in the amount of funds available for managing academic libraries coupled with the high pace at which information and communications technologies become obsolete, need for regular update of library management software. Indisputably, the cloud computing technologies comes with numerous advantages which may benefit NOUN Library in particular and academic university libraries in Nigeria and Africa as a whole. Thus, the following recommendations are made for libraries because:

1. Cloud computing technologies guarantee easy access to library services and resources from absolutely anywhere through the Internet and it allow for data storage. Also, library members of staff can securely share documents across locations.
2. Using cloud computing solutions to run applications would help libraries to eliminate funding of expensive computer equipment and infrastructure upfront, software licenses and hosting, maintenance, security updates and energy costs. All these will help academic libraries to judiciously utilize the meagre funds allocated to them and by so doing accomplish the core objective of making relevant information resources available to library users regardless of their physical location.
3. Cloud hosting made certain web pages which hitherto ran on a simple, standalone server decades ago available for use in the libraries today and it can cope with a suddenly spike in traffic in the way it couldn't back then. If for example everybody in the library accessed a given web page at the same time, the grid of servers hosting it would simply scale and manage the demand intelligently.
4. A cloud application is not limited to what a particular server can cope with; it can automatically expand or contract its capacity as needed. In addition, cloud services provisions are dynamic and seamless, they are not provided from a single, static server or an end user (s) / developer everything looks the same wherever and with whatever device you use it.
5. Cloud computing made the huge shift away from desktop computers to mobile devices, which had much less processing power onboard. For instance, Web-connected smartphones, tablets and other mobile devices are examples of what used to be called "thin clients". As a matter of fact, cloud computing made it easy for many companies / organizations now to allow their employees to logon to corporate networks or websites using their own personal device like laptops, tablets, and smartphones.
6. Cloud computing makes it possible for mobile devices such as cell phones to be smartphones and for tablets to do the sorts of things that we used to do on desktop computers, but it also encourages us to do more things with those devices, thus, for librarian to discharging library services to library patrons, they are no longer bound by space.

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

REFERENCES

Aina, L. O. (2003). *Library and information science text for Africa*. Ibadan, Nigeria: Third World.

Bharathi, G. J. (2018). *Cloud computing: IT0530*. Retrieved from www.srmuniv.ac.in/sites/default/files/files/unit-IITO530.pdf

Buyya, R., & Sukumar, K. (2011). Platforms for building and deploying applications for cloud computing. *CSI Communications*, *35*(1), 6–11. Retrieved from www.csi-India.org

Cieplak, T., & Malec, M. (2014). Applications of cloud computing services in education: Case study. *Advances in Science and Technology Research Journal*, *8*(24), 55–60. doi:10.12913/22998624/568

Cloud Academy. (2018). *Cloud computing architecture: An overview*. Retrieved from https://cloudacademy.com/blog/cloud-computing-architecture-an-overview

Corrado, E. M., & Moulaison, H. L. (2012). *The library cloud: Pros and cons*. Retrieved from http://www.thedigitalshift.com/2012/03/software/the-library-cloud-pros-and-cons/

Dhar, P. (2012). Cloud computing and its applications in the world of networking. *International Journal of Computer Science Issues, 9*(1&2), 430 – 433. Retrieved from https://www.ijcsi/papers/IJCSI-9-1-2-430-433.pdf.org

Fagbola, O. O. (2016). Information literacy skills: Developing competencies for NOUN library users. In N. Adetoro & C. Nkiko (Eds.), *Providing sustainable and equitable access to information: Perspectives from Nigeria.Festchrift in honour of Professor Morayo Ibironke Atinmo @ 70.* Tai Solarin University of Education Press.

Furht, B. (2010). Cloud computing fundamental. In B. Furht & A. Escalanle (Eds.), Handbook of cloud computing. Academic Press. doi:10.1007/978-1-4419-6524-0_1

Gerber, R. (2016). *Definition of a library: General definition*. Retrieved from https://libguides.ala.org/library-definition

Gokul, A. N., & Ambili, K. S. (2014). *Cloud computing and its application in libraries*. Retrieved from www.liscom.org/.../pdf/.../5%2015%20cloud%20computing%20and%20its%20application

Goldner, M. (2011). *Winds of change: Libraries and cloud computing*. Retrieved from https://www.oclc.org/content/damoclc/events/2011/files/IFLA_winds_of_change_paper.pdf

Gong, C., Liu, J., Zhang, Q., Chen, H., & Gong, Z. (2010). The characteristics of cloud computing. *39th International Conference on parallel processing workshop*. Retrieved from http://www.postdm.post.ir/_ITCenter/Documents/TheCharacteristicsofCloudComputing_20140722_154207.pdf

Harris, T. (n.d.). *Cloud computing: An overview*. Retrieved from https://www.thbs.com/downloads/cloud-computing-overview.pdf

Hurwitz, J., Kaufman, M., & Halper, F. (2012). *Cloud services for dummies. IBM Limited Edition*. Hoboken, NJ: John Wiley & Sons, Inc.

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

Huth, A., & Cebula, J. (2011). *The basics of cloud computing*. Carnegie Mellon University. US-CERT. Retrieved from https://www.us-cert.gov/sites/defaults/files/publications/cloud/computingHuthCebula.pdf

Jadeja, Y., & Modi, K. (2012). Cloud computing: Concepts, architecture and challenges. *Intenational Conference on Computing, Electronics and Electrical Technologies,* 877 – 880.

Kaefer, G. (2010). *Cloud computing architecture*. Retrieved from https://resources.sei.cmu.edu/asset_files/presentation/2010_017_001_23337.pdf

Kamila, K. (2013). *Role of cloud computing in modern libraries: A critical appraisal*. Retrieved from http://www.techsoupforlibraries.org/blog/what-is-cloud-computing-and-how-will-it-affect-libraries

Kaushik, A., & Kumar, A. (2013). Application of cloud computing in libraries. *International Journal of Information Dissemination and Technology*, *3*(4), 270–273.

Kiryakova, G., Angelova, N., & Yordanova, L. (2015). Application of cloud computing services in business. *Trakia Journal of Sciences*, *13*(1), 392-396. Retrieved from tru.uni-sz.bg/tsj/vol.13.2015,sup.1,seriessocialscience/sf/sf/info.tech/G.kiryakova.pdf http://www.uni-sz.bg

Lewis, G. (2010). *Basics about cloud computing*. Retrieved from https://resources.sei.cmu.edu/asset/files/whitepaper/2010_019_001_28877.pdf

Mitchell, E. (2011). *Library in the clouds: Cloud computing and its impact on library services*. Retrieved from https://aallspectrum.wordpress.com/2011/08/12/library-in-the-clouds-cloud-computing-and-its-impact-on-library-services/

Peters, C. (2010). *What is cloud computing and how will it affect libraries?* Retrieved from www.TechSoupforLibraries

Radha, L. (2013). Application of cloud computing at library and information centres. *Research Journal of Science and IT Management*, *2*(5), 43 – 46.

Reddy, T. R. (2012). Digital era: Utilize of cloud computing technology in digital library. *International Journal of Digital Library Services*, *2*(3), 92–106. Retrieved from http://www.ijodls.in/uploads/3/6/0/3/3603729/51-60.pdf

Sahu, R. (2015). *Cloud computing: An innovative tool for library services*. Retrieved from eprints.rclis.org/29058/i/RSahu.pdf

Satpathy, S. K., Maharana, R. K., & Panda, S. K. (2012). Use of information communication technology based services by faculty members and students of premier Engineering College of Odisha. *International Journal of Digital Library Services*, *2*(3), 76–91. Retrieved from http://www.ijodls.in/uploads/3/6/0/3/3603729/51-60.pdf

Schouten, E. (2014). *Cloud computing defined: Characteristics and service levels*. Retrieved from https://www.ibm.com/blogs/cloud-computing/2014/01/31/cloud-computing-defined-characteristics-service-levels/

Sun Microsystem Inc. (2009). *Introduction to cloud computing architecture*. Retrieved from staff.polito,it/alessandro.mantelero/cloud_computing/sun_wp2009.pdf

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

Swain, D. K. (2014). Cloud computing and its application in library management: A review of research. *e-Library Science Research Journal, 2*(4). Retrieved from https://www.researchgate.net/publication/298721580_Cloud_computing_and_its_application_in_library_management

Tata, S. (2012). *Cloud platforms: Concepts, definitions, architectures and open issues*. Retrieved from www.lifl.fr/iwaise12/presentation/tata.pdf

Tavluoglu, C., & Korkmaz, A. (2014). *Cloud computing for libraries*. Retrieved from https://www.atilim.edu.tr/files/Kutuphane/Yay%C4%B1nlar%C4%B1m%C4%B1z/Sunum/AyseKorkmazBOBCATSSS2014.PDF

University of Waterloo. (2010). *Introduction to cloud computing*. Retrieved from https://csuwaterloo.ca/~a78khan/courses-offered/cs446/2010_05/lecture.slides/16_cloudcomputing

What is academic library? (2018). Retrieved fromhttps://www.igi-global.com/dictionary/use-cmc-technologies-academic-libraries/229

What is information resource. (2018). Retrieved from https://www.igi-global.com/dictionary/information-resource/14466

What is library services. (2018). Retrieved from https://www.igi-global.com/dictionary/information-literacy-support-online-students/17103

Woodford, C. (2018). *Cloud computing*. Retrieved from https://www.explainthatstuff.com/cloud-computing-introduction.html

ADDITIONAL READING

Burmeister, B. (2011). Library in the clouds: Cloud computing and its impact on library services. Retrieved from https://aallspectrum.wordpress.com/2011/08/12/library-in-the-clouds-cloud-computing-and-its-impact-on-library-services/

Fehling, C., Leymann, F., Retter, R., Schupeck, W., & Arbitter, P. (2014). Fundamentals to design, build and manage cloud applications. Retrieved from https://www.springer.com/cda/content/document/cda.../9783709115671-c2.pdf?

Kumar, S., & Goudar, R. H. (2012). Intercloud computing-research issues, challenges, architecture, platforms and applications: A survey. *National Journal of Future Computer and Communication.*, *1*(4), 356–360. doi:10.7763/IJFCC.2012.V1.95

Sareen, P. (2013). Cloud computing: Types, architecture, applications, concerns, virtualization and role of it governance in cloud. *International Journal of Advanced Research in Computer Science and Software Engineering*, *3*(3), 533–538. Retrieved from www.ijarcsse.com

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

KEY TERMS AND DEFINITIONS

Academic Library: An academic library is a library associated with a college or university which supports the mission of the institution and the research needs of its faculty, staff and students. Although it is possible that a purely virtual library could exist, no brick and mortar institution has yet taken that step. Instead, most academic libraries consist of a physical space (usually quite large but on occasion as small as one room) and a staff of librarians and other employees that manage the building and its collections.

Cloud: This refers to a very large server on which different services and data are stored and are accessed with digital devices and Internet connectivity.

Cloud Computing: This is an umbrella term used to describe a category of sophisticated on-demand computing services.

Information Resources: A collection of valuable information generated by human activities. In a broader sense, it also includes related equipment, personnel and capital.

Library: A library is a collection of resources in a variety of formats that is organized by information professionals or other experts who provide convenient physical, digital, bibliographic or intellectual access and offer targeted services and programs with the mission of educating, informing or entertaining a variety of audiences and the goal of stimulating individual learning and advancing society as a whole.

Library Service: These are the resources, activities, programs, etc., which are provided by academic libraries to enable users meet their information needs.

National Open University of Nigeria: A foremost and pioneer institution established as springboard for Open and Distance Learning education in Nigeria.

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

Chapter 8
School Librarian Experiences of Learning Management Implementation

Michelle Kowalsky
Rowan University, USA

ABSTRACT

This case will describe a school librarian's experiences in assisting the faculty and staff of a public high school as they attempted to adopt school-wide learning management system. A compelling example of change management, this initiative describes solutions to challenges common to many types of schools and libraries. This installation served as a local and early solution in developing teachers' skill in online learning management and asynchronous communication with students outside of school hours. Details include the conditions and procedures of the Moodle implementation, the leadership philosophies which facilitated collaboration, and the change dynamics at the school which led to a successful outcome.

INTRODUCTION

The online learning management system Moodle was planned for installation at a small secondary school located in a typical suburban community on the East coast of the United States. The school served approximately 800 students of ages 13 through 18.This school year had been an especially difficult one for many staff members at the small, state-sponsored public high school of this case. Building construction and recent and impending changes in upper level administrators had combined to create an environment of frequent change unlike that ever experienced by this organization in the past.

While these events in and of themselves were not the source of any particular distress, their attendant decisions, results and direction have greatly impacted the overall organizational culture in obvious ways. An examination of the problems and issues implemented by teacher leaders, support staff, and school administrators in this case can help other schools considering initial use of an online learning management system. However, at times the school's staff seemed to become tired of frequent change, and started to display avoidance behaviors.

DOI: 10.4018/978-1-5225-9034-7.ch008

Copyright © 2020, IGI Global. Copying or distributing in print or electronic forms without written permission of IGI Global is prohibited.

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

A school-wide technological tool ultimately became the solution which brought this group together, at least partially. The school librarian's experiences in influencing the administrators and participating on the implementation are described here in order to share them so that others find common patterns in behaviors and decisions which result in successful initiatives.

Therefore, the objective of this chapter is to describe a potentially familiar public school culture and context in which a learning management system was introduced for school-wide use. Details of the leadership philosophies which permeated the project, the tactics employed by the school librarian to provide professional development to the teachers and manage expectations of the students, and the reflections of those involved can help other schools plan and manage their own technology implementations.

BACKGROUND

Moodle is an open-source learning management system, installed on remote servers and accessed through a traditional web browser. It allows teachers to assign homework to specific groups of students via an asynchronous web portal, as well as to collect student work and grade it in an online-only environment. Like other learning management software, Moodle also allows teachers to create class web pages with announcements and files to share, and it provides a discussion forum for teachers and students to exchange messages on a series of both predetermined and spontaneously generated topics. Managed logins help to keep each course's content private among only those in each class or section.

Minimal literature exists on the adoption or implementation of Moodle or other open-source content management systems for this purpose, nor about the effects of Moodle in professional development of teachers' skills in these areas. Hepburn and Buley (2006) explain that many schools employ open-source packages for their customization features and cost savings only once awareness efforts have succeeded. They exhort that patience is required while open-source initiatives take hold slowly in places like public schools.

Despite its age, Moodle is still a viable free online learning platform, according to a variety of studies worldwide. Yildiz, Tezer, & Uzunboylu (2018) found via a valid and reliable student review that Moodle was a desirable learning platform even beside Blackboard and Canvas. Studies in the U.K. also explain that secondary schools' main motivation for testing and using open source tools was the cost savings (BECTA, 2005); positive results were sustained over time in this review as well. Ureda and Nakamura (2016) also found that robust performance was possible in a limited-budget environment using Moodle in Japan.

Likewise, the affordances of open source software for learning and website management are well-documented (Kumar & Sharma, 2016; Abbitt & Davis, 2010; Liang, Ward, & Xiao, 2008; Pfaffman, 2008). Many believe that open-source solutions will become increasingly more prevalent in public institutions in the coming years (Baumgartner, et al., 2007). The continuation of learning management use in college after high school is also becoming a common feature of students' experiences (Dolch & Zawacki-Richter, 2018).

Teachers' negative perceptions about online learning, or the debate about whether course content should move online, were not an issue in this case, since teachers were the ones initiating the search for a solution which would empower them to increase their individual web presences. However, issues of motivation among the teachers came up later in the process, as the time commitment to implement-

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

ing their personal solutions increased; see Nair & Das (2011) for a review of related studies on teacher technology acceptance.

Similarly, issues of student motivation and perception of benefit of an online course management system were not problematic in this case either; see Foster (2011) for a discussion of literature related to online learning functions freely chosen by students from among other options. In any case, the role of the teacher in promoting, helping, and sustaining interest (for students and for other teachers), is well-documented in studies such as Fryer and Bovee (2016).

However, the challenges of other schools' cases, on which subsequent studies have focused and built upon, are related to the implementation of a system within an already functioning organization. Both the maintenance of the online course system itself and its user base were tied to a strong connection between the tool and its designed use. Especially in schools, ongoing training and support is often demanded by educators at all ranks. Thus, in all cases, infrastructure for teaching content and for maintaining technological functioning was paramount.

Teachers naturally vary in their energy and time commitments for learning new technologies. Fitzgerald (2011) specifically studied the outward processes of adoption and installations rather than the intrinsic motivations of such efforts. He believes that discussion of both successful and failed attempts can provide insight into the processes behind open source system choices during an initiative's lifecycle (p. 2). This study found that a process' "trial-ability," or its low barriers to varied experimentation by users, and its "absorption" or capability to be adjusted or fixed when problems arose facilitated its adoption (p. 17).

Unlike the Fitzgerald study, the present initiative proceeded on a voluntary basis for all, including implementers, users, and students, the latter of whom were very quickly complacent with requirements for Moodle use in their courses. Jeljaliet al. (2018) showed that students enjoyed using Moodle even more than Facebook for course-related activities, even though students were motivated to use other technologies. Regarding teachers, Li, et al. (2011) found that "identified regulation is the major extrinsic motivation affecting the extent of adoption (i.e., [non-teacher] adopters)" (p. 76).

Specifically, an open source activity "will thus be performed freely even if the activity is not pleasant in itself. In other words, it is performed NOT because the individual is intrinsically motivated for the pleasure and satisfaction inherent to the activity. The activity is performed simply because individuals have more fully identified and accepted the importance and value of the behavior" (p. 80). Intrinsic and extrinsic motivators were similarly noted for students (Aristovnik, et al., 2017; Waheed, et al., 2016) and for teachers (Santos & Carvalho, 2017; Wright, 2015) alike.

This has interesting implications for teachers, who may decide that an initiative is "the right thing to do" for teaching their students well or better, even if it requires more attention or effort to learn for themselves. In fact, the Li, et al. (2011) study also found that those who adopted open source software to a greater extent did so when belief in the presented strategy for a tool's use is confirmed, and their need to know -- or curiosity -- was strong. Non-adopters, on the other hand, were those who did not believe that the tool was the best strategy for the task at hand. In either case, a participant's ability or capacity to learn the tool was not a factor in their decision about whether or not to adopt it. Later, Deepak (2017) tracked the features most used by teacher Moodlers as well. Factors in the present case confirm these patterns, thus offering an interesting line of inquiry for the future.

Midha and Palvia (2012) studied open source use over time, during a span of three years, and found that responsibility for implementation (including someone to fix problems), a strong user base (who has tried out the software for their particular needs), and modularity of components within the system (where some features could be worked on independently of other features) were factors which helped

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

retention of use. Although this case was about non-teacher computer users, similarities among the preceding study participants and the present case are easily identified. Analysis of teachers as learners of Moodle was explored by Bondy, et al. (2017), and Essel & Wilson (2017) described similar issues with university-level uses.

This case describes a school staff and student body typical of an American public high school. One of the school's teachers, the school librarian who procured buy-in from several colleagues, attempted to bring a technological solution to a real problem of communication and information exchange among teachers and students at the school. The librarian's brainstorming with the staff, the group's weekly and monthly checkpoints, and their attainment of success milestones offer procedural details and environmental characteristics which clearly identify successes and failures of this type of initiative for others.

As a result, three aspects of the case become clear indicators of success during the narrative, highlighting initiative's potential areas of growth and identifying its sustaining events -- listen carefully in my narrative below for the impact of those involved, the speed of their efforts, and the products of intellectual effort communicated by the tool. The school and library conditions revealed important aspects which affected success, namely a) the use of system administrators from multiple generations, including students in various grade levels, professional staff, and teaching faculty; b) the speed at which users learned the system and found appropriate collaborators and fellow learners at their particular skill level; and c) the swiftness, regularity and complexity at which content was developed and posted to the site, the latter of which was a clear failure in the planning and execution in this particular initiative.

CHANGE MANAGEMENT

The most recent major significant change experienced by the organization was the retirement of the school's principal, who held his same post for over 20 years. He had both supervised and taught in the school since its building was constructed in the mid-1960s. The school's subsequent leadership rose from internal promotions from the teaching ranks, and became newly responsible for student discipline and building operations. New leaders examined all aspects of the school's functions and began making recommendations quickly.

None of these changes were especially surprising to the organization as a whole; faculty and staff knew how the organization operated regarding succession planning, and all of these changes were expected. The nature and style of leadership by the building administration, however, now looked quite different, and the organization felt different, from its longtime traditions held in the recent past. There were new ways of doing things and a new operational style for which everyone needed to adapt.

The new building leaders made several subtle, intentional changes to the organization's informal power structure, which many teachers saw as an unanticipated benefit. The dynamics of interaction between the two new leaders, the principal and the assistant principal, appeared to be harmonious. However, a major negative event which occurred in the district over the summer, and its attendant press coverage and public scrutiny, seemed to have had little or no lasting negative effect on "business as usual."

Despite the new administrators' worry to the contrary, they were handing major issues well as the new leadership team. They seemed to be handling their duties in stride, and kept a purposefully calm demeanor despite their relative inexperience in their new roles. So why was their staff so stressed, overwhelmed and angry? Things seemed to be going well!

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

As far as management and operations of the school building were concerned, things were indeed going well as the school year started. Fewer major student disruptions occurred each day, and those that inevitably happened affected fewer educational activities than previously experienced. In fact, most events were treated by these leaders as having almost the same effects on school business, despite the degree of drama in the event at hand. The principals kept an even-keeled demeanor whether things were smoothly sailing (when students behaved admirably, almost angelically, at the recent school dance, for example) or things were getting rough (such as when school policemen caught students attempting drug transactions in the parking lot).

One key to the difficulties in transition for the teachers in the schools in this district was shown through their behaviors. In attempting to control very complex situations related to the changes in power structures at the school, the teachers focused on too many details of change all at once. Since it was not possible, nor desirable, for teachers to try to manage the entire school's operations themselves, they really needed to rely on the leaders to do their job of leading. The teachers needed to trust that the administration was working on their behalf.

Managing professionals can be an overwhelming and daunting job, especially leading a large organization which was comprised of so many (sometimes unpredictable) variables. In trying to control the school's "output," the teachers ended up focusing on the wrong things, much in the way that Neff and Citrin, authors of *You're in Charge, Now What?* (2005, p. 38), explain. While distracted by management tasks, the teachers missed opportunities to help students reach for a shared vision and to use their own positions to help fulfill the organization's mission. The teaching staff needed a reason to leave the crucial leadership tasks upon the shoulders of those now in charge.

VISIONING AND STRATEGY

An important activity that any leader needs to undertake is that of visioning. This major step, once completed with the assistance of those governed, will make obsolete many of the morale and behavioral problems of any staff. A vision is a statement of where an organization wants to be in the future, a goal worth working toward that is described so vividly it becomes the overarching and compelling drive of the entire organization.

In this case, the vision for the project should have described the future identity of this school, specifically the outcomes of Moodle for its students and teachers. The vision needed to state the staff's direction for the future. Additionally, a vision should not be a set of practical steps to undertake in the immediate future (that is a strategic plan for how to get there). The project vision instead required an image of what the organization wanted to achieve and work toward. Most importantly, a vision must exist first in a clear and convincing way, before any of the procedural issues are designed or tactical problems are resolved.

The new leaders and their team of teachers needed to create a vision of what their shared world could look like moving forward. As Peter Senge in *The Fifth Discipline* (1994) writes, "Vision is a specific destination … a picture of a desired future… It can truly be said that nothing happens until there is vision. Conversely, purpose without vision has no sense of appropriate scale" (p. 149). The employees of this school obviously had a general purpose in mind, that of educating students. They seemed to do this well and without incident most of the time. But, the staff was not currently rallying around a vision of the future for their school, nor focusing their efforts on anything specific.

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

Without a bigger and better target to shoot for, teachers and students just went about the "business of school" as they normally would, which could also be described as just "going through the motions!" It seemed as if nothing really bad nor nothing really good came out of their daily educational efforts. Some staff members felt that their efforts in working on the initiative were not recognized at all. The vision was not compelling or complete for everyone, but for those who could see Moodle's potential, it was motivating.

A more individual and personal approach was needed to inspire the troops. Real emotional risk is involved when putting forth a vision that appears to be quite far from the current status quo. Some of the the adult male leaders who were very conscious of their displays of emotion found it difficult to get excited about a new technology that was unfamiliar. However, it is only through this type of trust and risk-taking on the part of the leader that workers in an organization can help it move "from good to great" (Collins, 2001, p. 5).

"Good is the enemy of great," explained Jim Collins in his bestselling book, "and that is one of the key reasons why we have so little that is great" (Collins, 2001, p. 1). Every constituent of the school in this case likely agreed that their high school appeared to have the ability to be great; it had adequate funding, supportive parents, and nice students. So why was this organization potentially content with being good but not great? Perhaps it did not yet know how; it needed a rallying event or new experience to motivate the team toward a shared goal again.

Similarly, schools that learn are able to move ahead after becoming unstuck from previous habits, whether those habits of mind or behavior were good or bad. "We allow our goals to erode when we are unwilling to live with emotional tension. On the other hand, when we understand creative tension and allow it to operate by not lowering our vision, vision becomes an active force" (Senge, 2000, p. 153). Perhaps emotional intelligence is a difficult concept to teach to a large organization, but small steps toward the visionary ideal are certainly attainable.

And that is the job of any organization's leaders, even if they must learn how themselves, before teaching others. "In leadership transition situations, employees are understandably anxious to hear a road map for the future and what it will mean for them" (Neff & Citrin, 2005, p. 30). The administrators needed to do this visioning for change although they were only in their respective jobs for a short time. In fact, schools are given innumerable fresh starts every September to try to articulate their vision, and then enlist staff help in working toward it every hour of every day, with each using their own unique talents and gifts.

Famous leadership author Robert K. Greenleaf (1977) explained that authority is given to a leader more readily when it is not coerced, but freely granted by the followers (p. 21). When school leaders make this authentic connection with the teachers and staff, they will empower them to release their energy toward fulfillment of important and worthwhile goals, rather than just toil independently of each other without any sense of focus or accountability.

A strategic plan, which would guide the organization toward fulfillment of this vision, was thus also needed. Design of this plan needed to involve faculty, staff and students in the planning and implementation. Specifically, the plan cannot exist solely inside the head of the leader. Short-term and long-term goals needed to be literally written down and assessed at appropriate intervals. Without documented progress, the organization would have no way of knowing where it's going or where it's been.

Nevertheless, these larger goals could be facilitated by the project at hand. Installation of a learning management system would be a shared whole-school goal which was able to redirect teachers' energies upon details which were specifically tied to student learning. Moodle would become just the refocusing

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

element that this group needed, since it was new to everyone and bonded the staff in this learning organization via a common learning experience. By championing this initiative, the school librarian became an essential leader for the school as well as a trainer of her peers.

TOOL PROVIDES MOTIVATION

At the end of the previous school year, a professional staff member and the school librarian discussed ways that they could encourage teachers to submit files they wanted posted on the school webpage in a timely manner. Since teachers often rushed into the webmaster with only minutes to spare before they wanted to use a new web page item online with a class, the staff needed more lead time for posting. However, distributing web page duties throughout additional staff members was not an option due to job descriptions and union regulations.

Administrators also needed a way to meet expressed teacher needs for speed in technological developments. In fact, many thought it was not only rude of teachers to demand such instant service, but that these demands were getting to be too much work even for the small team who shared website posting duties. Previous training in web page creation did not develop the teachers' skills in enough depth or breadth, given their time on task. Complaints about homework and project communication needed a solution.

After several weeks of brainstorming options to change the workflow of technological communications, the librarian and a constituent group decided that teachers needed the ability to post things online themselves, and to manage their own web presences. Yet while the uploading of classroom items could clearly be managed centrally with a division of labor, many time-sensitive and school-wide items needed approval before a variety of these teachers, counselors, and professional staff members could release them to the school community.

Naturally, a Moodle course management system seemed like a solution which provided personalization, individual responsibility, and efficient oversight. Since basic Moodle code was free and open source, the district could afford to experiment with it, providing only the donation of the librarian's time, mostly over the summer. The school had no in-house expertise in Linux server setups, so the school librarian procured a remote host for a small fee, installed the package, and customized the school-wide settings.

Most of this work could not have been done without the volunteer time or administrator support of the leaders involved. Use of school resources and proper branding of an open-source tool required many meetings, much research, and extensive technical support. However, the benefit to the district would outweigh the extra time spent up front on investigation and implementation.

Since student/user sign-up would need to be done from home after the school year started, yet remain within the school's technology policy guidelines, the school initially required that they use anonymous usernames and fake personal information. Students thought this was hysterical, and they then self-enrolled in their teachers' courses, disclosing their pseudonyms to instructors. In essence, it seemed like the ideal solution to a complex problem, and interest of students generated momentum for additional teachers to set up their courses online.

In introducing Moodle, the school librarian was hoping that teachers would become enamored with the other functions besides "just posting files" in the main assignment folder. The librarian held short workshops for teachers on using discussion forums, calendar functions, and collaborative spaces. Since the school year would start with a more sophisticated system than just Edublogs or Google Pages. The simplicity of some turnkey tools upset students so much that teachers got violent reactions from even

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

suggesting them. Therefore a multifunctional and robust tool provided the opportunity for growth without "learning a whole new system" which was unfamiliar.

Although most faculty members did not know that the school librarian's suggestions for adoption of Blackboard™ had failed twice in recent years. Trying Moodle as a "free" system demonstrated proof-of-concept, showing that robust online tools in the hands of teachers could provide additional learning opportunities for students as well as better management functions for adults.

The grass-roots approach taken by the librarian leader to train those teachers who were ready to learn was time-consuming but paced the initiative's growth at a manageable rate. Many teachers who would consider themselves not tech-savvy actually advanced the Moodle adoption project in small increments better than any advertised building-wide roll-out and training program. The decision to not take teachers up on their repeated suggestions to have advanced "how to make a web page (HTML)" classes helped them to rely naturally on Moodle for these functions.

The school librarian had taught basic HTML to students and faculty for two years prior, but the teachers simply could not learn advanced HTML quickly enough to make their Moodle pages look like the professional-looking pages they see on the web. While some of the teachers may not have realized this learning-curve constraint, many others abandoned their graphic design aspirations for appreciation of functionality. Those who were able to "connect the dots" and see how Moodle could help them in their classroom activities showed others how to solve real logistical problems from their daily teaching lives.

For weeks thereafter, the school librarian experimented with the Moodle administrative settings, imported a few modules and plugins, and created for most willing teachers their initial courses with a similar school-wide structure. She marketed Moodle to the teachers as "course web pages" rather than fully disclosing all of its features initially, to avoid a natural fear of complexity. In order to not overwhelm teachers with all of the fancy features of this learning management system, the librarian only disclosed more advanced options when they were requested.

As teachers slowly inquired further, the librarian demonstrated additional features on demand. This allowed for a slower, more natural roll-out pace, which pleased the school administrators and reduced negative feedback which might have slowed or stopped the initiative in its early days and weeks.. As teachers asked more advanced Moodle questions, and requested more complex solutions, the librarian advertised the various Moodle features at teachable moments, along with the names of those teachers already championing them. This allowed for more peer-to-peer interaction among the teachers, as good-will and information sharing increased.

PROGRESS AND MOMENTUM

Although it had seemed like an eternity waiting for teachers' requests for more sophisticated features, they were sticking with it and actually helping each other. Once a month the school librarian hosted a "course web pages user group meeting," after school in the library. This helped to develop a community and to reinforce the idea that the initiative's champions were not the sole teacher of everything about the system. This encouraged them to use each other as resources as they learned something new together.

One benefit of having a project led by the interdisciplinary-focused school librarian and not a subject-specific classroom teacher is the natural structural movement away from the leaders who introduced the concept. As teachers began to internalize new norms and adjust to this new Moodle culture, they began to rely on teachers with similar teaching styles to help learn how to post homework worksheets or quizzes.

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

Teachers of different subject areas began to form working groups together according to their own learning styles or current Moodle ability levels. And they figured out that they periodically needed to reach out to more experienced users when they could not solve a problem within their peer group. Thankfully, the benefits of having this tool motivated teachers to seek new learning. Students' demands for functionality also drove their further learning, sometimes faster than was comfortable.

When they approached the school librarian with a question, she would work with them in that moment to figure out how to do different things, yet ironically this sometimes took too long for them and made the teachers impatient. Some teachers soon started to realize and appreciate how much work went into creating regular web pages, and that was an excellent and unexpected outcome. The librarian determined that smaller bits of information, with targeted visible outcomes, worked best in shorter, more frequent encounters.

As the librarian set up new courses for the willing teachers, she asked them each to set up an individual appointment with her so she could show them how to set the "enrollment key" (password) and settings for their course. Five teachers signed up for this offer in the first round, and two teachers spent quite a lot of time on their pages. The librarian informally gathered data on how the learning and diffusion was going, subsequently taking a snapshot (backup) of the entire school's Moodle progress every three weeks. She kept track of the order of features accessed or requested by various teachers in response to the instructional delivery problems they were trying to solve. These became topics for subsequent library workshops.

As of the sixth week of Moodle implementation, 52 courses were created. One whole department (6 Science teachers) agreed to look at the Moodle tool, along with three Language Arts teachers and two Special Education teachers. In addition, one Art teacher, one Music teacher, and one Social Studies teacher also agreed to participate, although they have not progressed as quickly as those who had colleagues from their department also starting use of the tool. This initial group created partnerships on whom to rely for positive reinforcement or for answering spontaneous questions. These individuals would turn out to be the "turn-key" representatives from each department to help bring the rest of the school on board.

As project administrator, the school librarian created a "practice course" for the student library assistants and the student science assistants. These students were those who didn't want to take a study hall but had free periods in their schedules to assist teachers if they wished. These students would help the librarian with many of the simpler click sequences involved in setting up the courses and assisting the teachers in adding basic elements. In the first month, twelve high school students were given Moodle administrative privileges for the practice course so that they could practice their new skills and observe Moodle's behavior before editing an active teacher's page. Each of these students mastered most of the basic skills of Moodle within the first 10 minutes of their encounter with the tool. Clearly, it was an intuitive interface for them, albeit one they had never seen before.

One student, a junior boy who was interested in going into the computer field in some way after high school, took the school librarian aside after his first 10 minutes with the product. He proceeded to advise the librarian of all the ways he would like to change the interface and make it more complex, functional, and efficient. The librarian immediately gave this student software permissions equal to the top-level server admin category. He worked on both cosmetic and functional changes for the entire school's templates over the next three months.

An additional three students, assigned to various teachers as their study-period assistants, came to the library to make adjustments to courses at teachers' requests on an almost daily basis. These students and the school librarian became, in essence, a local Moodle users' group. Although this student-assistant

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

workload seemed alarming at first, since teachers were outsourcing their Moodle learning to these student helpers, it indeed accomplished a lot of the set-up work quickly.

As the school librarian talked about this project with others, several interesting developments occurred. Student assistants were excited to help and assisted the librarian in posting course descriptions and links into each of the school's courses, which was a labor-intensive activity. Some members of the professional staff were excited to put links directly to the Moodle courses on the school's web page. In this way the school was able to ensure that only their own students had direct access to the login screen of the courses in which they were enrolled. This also provided privacy assurance to teachers that the whole world would not have access to their course contents.

With the help of the 15 teachers who had course pages posted by the end of the sixth week, over half of the students in our school had "self-enrolled" in at least one Moodle course. Teachers were very concerned that students would not be able or willing to do this step outside of class time. Instead, only a handful of students had problems, mostly because they did not read and follow the screen that said, "Thank you for signing up. Now go to your email to click on the link to verify your enrollment."

Other developments displayed similar cooperative and collaborative efforts. Students asked the librarian if they could create Moodle courses for their student clubs, so that they could schedule meetings that did not conflict with one another. The librarian promptly did this, with the help of a library assistant and another student volunteer, over the course of one afternoon. Student representatives of different clubs stopped into the library to request their preferred course designs and quickly learn the functions in which they were interested.

The science teachers asked for a course in which they could share teacher files with their counterparts at another high school in the district. A Language Arts teacher asked to have a Literature Circles group for the spring so that students from both schools could discuss the books they were reading. Yet another teacher asked to have space on the library's Moodle server to try to create an SAT practice course for individual students to try before asking all schools in the district to use it. The school newspaper editors also now had their own course to discuss ideas, post articles for review, and announce deadlines. All of these were positive and authentic steps toward using Moodle as a collaborative tool.

The original plan consisted of strategically introducing and gradually training the school staff in use of Web 2.0 tools. The leadership team, which included the school librarian, marketed the Moodle add-on tools as part of the solutions teachers had requested to everyday problems concerning website management. The interpersonal aspects of the initial set-up and rollout processes were smooth. The technical aspects of this initiative required more energy, especially since they did not concern the users directly and were "invisible" yet necessary processes.

Likely two-thirds of the librarian's work time in the summer months was spent on this initiative. She set up a Linux server, learned to administer it remotely, purchased a domain name, installed and extracted the Moodle course management software and modules, along with a variety of customization processes. The school administrators eventually provided two weeks' paid time toward the librarian's effort to lead the Moodle initiative, but most of the setup prior to the academic year became a labor of love and a volunteer effort.

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

SUCCESSION PLANNING

Students reported regularly to the librarian and school administrators that they really liked Moodle. Of course, these positive comments were also accompanied by common snide adolescent comments like "what took you so long" and "finally, a web page that works" and "hey, we've moved into the Twentieth Century" comments. But, the leaders considered this a good sign. In the first week, several dozen students were already reconfiguring options and asking me for rights to change some of their settings, which she gladly adjusted as one of the school's top-level Moodle administrators.

Needless to say, many of those student-labeled "boring" options and settings were purposefully set by their "controlling" teachers, so many times, the librarian had no choice but to initially support the teachers' intentionally limiting choices. The librarian tried to help the students realize that teachers were learners too. If students ever wanted their teachers to do more sophisticated technologies in the classroom, they'd have to give their teachers time to learn (or take steps themselves to actively help the teachers learn), or else changes might not happen as they had hoped. To the librarian's delight, this explanation went over well.

In this case, the school librarian was able to organize a team of a dozen or more students who volunteered to be "tech support" for the teachers as they learned to use Moodle. At first, this support was almost a one-to-one student-teacher ratio. The librarian proceeded to train the tech support students in small groups in order to help them understand "what the teachers wanted." The support students brainstormed with the librarian a hierarchy of skills they wanted teachers to acquire in Moodle next, such as discussion forums, news modules, or instant messaging.

Simultaneously over a period of several months, the librarian trained the teachers on the basics of all of these Moodle skills. This particular part of the project was the most frustrating for her, however. Three-quarters of the initially interested teachers would be considered among the most tech-savvy in our building. Other tech savvy teachers already had their own web pages, and knew HTML, CSS, XML and other tools. New users simply could not keep up with their technologically advanced peers, and so they became frustrated.

What became a curious phenomenon almost immediately is that all but one teacher in the pilot group would not investigate something new without the librarian first demonstrating how to do it. One teacher that made significant progress in learning Moodle, a new teacher in her second year, became the school's most advanced user to date. She was comfortable "geeking around" and believed that the librarian's trainings went too slowly for her. Others were more comfortable with the demonstrate-then-follow techniques familiar to them from earlier educational experiences.

So once the school librarian realized that the next 12 teachers were waiting for her to lead them through each process step by step -- and that each teacher wanted to do something a little different with Moodle -- this made any kind of group workshop doomed from the start. She quickly changed her strategy and began referring teachers to each other, or to the support students. This made the librarian seem like less of an expert and less reliable as their "emergency personnel." Ironically, backing away meant more growth for the group, and became a significant librarian contribution to sustainability.

The librarian held user groups instead of workshops before school, at lunch, or after school; she now allowed the content of the workshop to be determined and taught by the users themselves. The library simply became the meeting place and host. Some advanced users began to dislike the fact that they had to spend their time teaching less experienced Moodlers, so these user groups ultimately were not per-

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

ceived as a good use of more expert teachers' time, even among those who were willing to collaborate with others initially. This became characteristic of reported students' experiences as well.

Another curious observation from a few months into the implementation was the teachers' impatience with teach others' learning curves. Teachers who spent the time to learn basic options were critical of those who did not spend as much time or get as far along in their skills acquisition. The librarian lost the group participation of some of these slower teachers; although they were willing, they were admittedly not the most tech- savvy of the group. Students had been voicing more frequently and loudly their complaints about the pace of teacher's adoption of advanced Moodle features, so the librarian had to step in and ensure that no students, even the Moodle admins, were allowed near these after-school teacher-only interactions. The teachers needed support, not criticism, and the students needed to learn empathy and adult communication styles.

Clearly, even the school's most mature adolescents were not yet developmentally ready to see the adults as true learners like themselves, struggling with concepts new to them. Students not only used the resources which were posted by their teachers, but also quite naturally checked the site regularly for updates they wished were there. The teaching staff simply could not provide enough content for their hyperactive patterns of media consumption, and so the students became bored quickly.

END OF THE SCHOOL YEAR

Some teachers were not very interested in thinking through use of the Moodle independently, and often forgot skills that the librarian had shown them even a few days earlier. These characteristics were important to note for two reasons. First, the leaders needed to better tailor the training to their needs so that the skills would "stick." Peers felt that the librarian refused to "do it for them" and the librarian only taught skills on a "just in time" basis. Therefore, there was no authentic buy-in after the first round of early-adopters. Pre-planned rollout strategies needed to be determined in advance, either informed by research or brainstormed among a diverse leadership team.

The situated learning strategies employed the school librarian in isolation were not enough to encourage skill transfer for teachers. However, it did help the librarian to learn how to shift from one teaching style to another quickly, and to spontaneously provide examples which were meaningful when shifting from one subject to another. The adults wanted a quick temporary solution for their learning communication issues and they initially believed that using Moodle was that solution. Students were understandably more cautious. Yet several months into the implementation, enthusiasm started to wane.

The librarian continued to explain how Moodle would save them time, increase student interaction, and return better student products. She even showed them a model of how two of the school's teachers were already using the learning management system effectively. She invited teachers individually and personally to the user groups to help promote the process. These advocacy initiatives went well and encouraged attendance consistently. But increasingly, teachers did not want to spend more time to attain the greater goal of change in pedagogy and perception. Not even a little more time for an exponentially useful outcome was entertained, and the time constraints of teachers really started to show.

The next steps were to show the subject area supervisors the usefulness of Moodle by using the example of some of their teachers who have tried it. The librarian explained to them how and what to praise among the gains made by their constituents. Involved in this conversation were the Special Education department teachers and their director, whose students have benefited most obviously from the

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

adoption of this technology. Since many school administrators were admittedly not tech-savvy, sharing the details became a challenge.

During the course of many teachers' traditional routines, there was no efficient way to integrate these new tasks into their workflow. In fact, professional development on wikis were more useful to the supervisors for their own tasks, and more clearly helped them coordinate tasks between school buildings in the district. If the supervisors were not using Moodle themselves, they had a hard time understanding why to praise others who did implement it and achieve results with students. Again, the aspect of intergenerational understanding comes into play, and becomes a challenge for both advocacy and operations.

When teachers needed help creating their own web pages, Moodle was marketed by the school librarian as a solution to this problem. The personalized, individual tutoring preferred in a school of 80 teachers became overwhelming as a staff training exercise. Teachers' demands for sophisticated web page appearances, combined with perceived lack of time and resources, became an opportunity for technology to drive pedagogical change.

Since Moodle, a self-proclaimed "constructivist" teaching tool, could not be easily adapted to teachers' linear lesson style, or the often required static "one-way" delivery of information, teachers had to adapt in order to satisfy their initial "personal web page" goals. While some teachers were hosting forums and having learners talk to each other, others just posted information for students to read. In addition to posting homework, PowerPoints and links to web pages and videos, others began, but did not sustain, thinking globally and interdisciplinarily about courses and departments.

Teachers also appeared to have considered the affordances of a shared system in order to "save time" of designing assignments individually. Some were observed to be empowered to use library databases and RSS feeds, which were once mysterious "techie things." By the end of the year, though, full participation had dwindled as aims of the school's educational programs pointed more toward closure and completion of tasks at the end of the school year.

School-wide stats by the end of the first year of implementation were only truly impressive in terms of our student users:

- Number of teachers proficient enough to Moodle independently: 14 (including all of the science department)
- Percentage of students currently signed up for Moodle: 408 (62% of school)
- Number of parents currently signed up for Moodle: 23 (for reasons unclear)
- Number of courses with students accessing daily information through May: 55
- Teachers using it for non-teaching purposes: 2 (using it for remote file storage)
- Number of teachers signing up in last quarter of the year: 1 (an art teacher)

This project reminds us of the struggles new learners have with their emotions, thinking patterns, ability to see the big picture, and entrance into a new sandbox or community of practice. Leaders must remember that teachers who were new Moodle learners themselves were accompanied by students on their journey, an unusual learning environment for adults. The school librarian personally experienced both the joy of getting something to work and the frustration of not finding answers to everyone's questions. Clearly, teachers experienced this variety of emotions as well, and they became part of their shared experience of this initiative, for better or for worse.

The implementation was overall a positive enough experience to consider again in the future. Perhaps sharing these experiences will one day help to create a best practice model which mitigates challenges

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

such as time, money, and motivation, effectively claiming "it can be done!!" However, without all of the important title elements --multigenerational course administrators (in students and adults), speed of updating and responding to troubleshooting queries, and exponential content development visible to frequent users -- sustainability would continue to be a struggle for both the project and the district.

LEADERS' VIEWS OF THE CHANGES

Leaders' words, as well as their actions, are often under a microscope almost like celebrities.' Everything they say and do help to shape an organization's culture; leaders can inspire or berate, celebrate or punish. When examined in detail, one can view the words and actions of school leaders as sending a multitude of messages to their staff -- most intentional, many unintended. In this Moodle implementation, the words and deeds of the school leaders had a great effect on the teachers' and the school librarians' experiences in both positive and negative ways. The successful outcome was not without its difficulties.

The leadership team for this project had similarities in their belief systems, yet they showed a few inconsistencies in the messages they were broadcasting to their constituents. In reflecting upon the project, the librarian was able to uncover these leaders' views of themselves, of their employees, and of a significant social issue affecting their workplace.

Warren Bennis, in his essay "Become a Tomorrow Leader" (2005), discusses how leaders have a strongly defined sense of purpose and vision:

Leading means doing the right things; managing means doing things right. Too many organizations are overmanaged and underled because the people at the top are better at making policies, practices, and procedures than they are at creating a compelling, overarching vision. They are managers, not leaders. They are looking at how to achieve greater efficiency and how to control their systems and structures more effectively. They are looking at how to do things right (p. 103).

This explanation in some ways described the school librarian and the teacher leaders; all were interested in providing a tool which exactly met the needs of those involved. Naturally the leaders would fall into the opposite category, of designing structures and vision; however, in this case, the librarian attempted to lead but quickly became mired in the management of the software. Bennis (2005) explains this well by saying:

We need more leaders -- people who do the right things. . . When you think about doing the right things, your mind immediately goes toward thinking about the future, thinking about dreams, missions, visions, strategic intents, and purposes. When you think about doing things right, you think about systems and processes. . . Leaders ask the what and the why questions, not the how questions. Leaders think about empowerment, not control (p. 104).

The current principal and assistant certainly did not lack dedication, commitment or drive. They were certainly capable enough to have the overarching teaching and learning goals within their reach. Even without a superior holding them accountable, it was their collective responsibility to organize and plan a mission with the rest of the team. When some formerly tired, angry, or disenfranchised staff members are able to realize that participating in the creation of a vision of a better workplace -- one that is designed

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

to enable greater student achievement -- is in their best interest, visioning will be a more participatory and fulfilling activity for everyone.

During the project, the school librarian asked the school administrators to discuss their views of leadership in light of the new initiative. This served as a debriefing activity and a chance to reflect on accomplishments of the school year. The librarian individually asked for of the leaders involved in the Moodle project the same questions independently, to gauge their views of how leadership influenced the project's outcomes. Although it was not possible to determine the extent to which specific actions of the school librarian resulted in desirable outcomes of the implementation for the school library program, a holistic view was employed in discussing the process of change with school administrators during the initiative.

The librarian compiled the leaders' answers in order to try to find patterns which helped to move the initiative forward, in anticipation of continuing it into the subsequent school year. The reported change management behaviors and beliefs may appear familiar to many school librarians, so commonalities may assist with strategy development for future endeavors.

Initially in answer to, "How would you describe your leadership style?" the most striking similarity among the leaders' answers was their fondness for situational leadership. All four leaders identified at least one of their leadership styles as "situational leadership," with two leaders (building principal and district superintendent) using the term explicitly.

All leaders described the general idea that they do whatever the situation requires, whether it be collegial or collaborative work, influencing work, or structured/authority-based work. All believed in their abilities to perform many styles of leadership equally well, depending on the problem or goal that arose. In the Moodle implementation, it was unclear which of tactics the leaders believed they were using to advance the project, since they mostly spoke in generalities.

Only one leader, the superintendent, volunteered other styles of leadership that he felt he exhibits at times, describing himself performing the authority-based, team-building, and collegial aspects of the transformational approach. He also provided examples from other initiatives, while noting that he also teaches a graduate course on educational leadership at one of our state universities. While the superintendent's influence on the implementation process was minimal during the Moodle implementation, his positive recommendations and words of encouragement were remembered by the leadership team.

The principal described his situational style as a "pick and choose" method, where he doesn't firmly subscribe to one style over another, nor did he ever want to. Rather, the situation and its severity and importance would dictate the style he chose, which almost always included a self-described "see it for himself" component. This explanation is definitely aligned with the leadership style he exhibited during the Moodle project. No one clear or consistent message was sent by the principal during this time, which may have resulted in confusion about its priority or importance among staff members.

The other administrators' responses focused mostly on building relationships with subordinates, specifically on creating "buy-in" and getting everyone moving toward the same goals and objectives while being supportive of them. They explicitly mentioned helping subordinates perform problem-solving, and having to exercise restraint in letting their employees make their own decisions and helping them get better at it. However, the degrees of success of these activities on the part of school administrators were critiqued a bit negatively by the librarian.

When asked, "Do you think leaders are born with leadership characteristics, or can those you lead be trained to become leaders?" yet another similarity arose in that all four believed leaders were not born. A predisposition or character or personality, or some early experiences might facilitate the leadership

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

acquisition process later on in life, all agreed. This was also espoused by the librarian and the volunteer teacher leaders, so this particular shared belief could have been utilized as an explicit focusing idea during the initiative.

One principal stated that he believed everyone learns to lead on the job, or when they are put into a leadership role. Another explained that administrators learn from each other and from role models, and that leaders are usually a product of the good influences in their lives and careers. Both highest-level administrators stated that some physical traits might facilitate leadership ascension, such as physical stamina or appearance. The others concurred that certain leaders already had a natural ability to deal with people, and a diverse group of people at times, before becoming leaders. This seemed to contradict their earlier statements and frustrated the librarian.

In response to "What leadership characteristics do you value in those you lead?" the school leaders all spoke of honesty and trustworthiness. Two spoke of a commitment and loyalty to the organization; another explained that being consistent and present was important as well. They valued an exchange of ideas, while all valued a subordinates' willingness to take responsibility for his or her actions and/or exercise good judgment. Each of these characteristics was evident in the Moodle initiative and explicitly by all of these leaders.

The superintendent emphasized his value of an employee's organization and concrete thinking, in addition to some physical presence items like a good speaking voice, which he emphasized could be taught if necessary. The principal expounded on the importance of keeping the school leaders informed so that they could deal with issues from a position of strength and not be on the defensive. The librarian admitted that she could have indicated potential problems in adoption rates or waning motivation earlier in the process so that the principal could have helped provide encouragement before problems started to mount.

Specifically, the principal also said he encouraged his subordinates to "engage in a dialogue," take the initiative, and bring forth "thoughtful opposition" when appropriate. An assistant principal described the value of an employee's ability to comply with the organizational structure and see their views and others' in the context of the whole organization. He also stated a reluctance to answer this question and a general suspicion of it, which he confirmed was not related to the interviewer without qualifying his feelings further. This uncertainty would likely be sensed by teachers during any initiative, and possibly was a source of argument about not changing the "status quo."

Another question posed to leaders was "What challenges do you face in your day-to-day dealings with those you lead?" Issues with differing philosophies and perceptions among constituent staff members were commonalities. Other topics like making good decisions and helping others do the same were common challenges for all of the leaders. One specified that not solving all of the subordinates' problems for them was something he had to learn. In the case of the Moodle implementation, this represented a diametrically opposed view from his counterpart as indicated in a previous answer. The librarian felt that this conflict in levels of assistance, or even in philosophies of providing assistance, hurt the Moodle project. If teachers could find differences among their school administrators' attitudes toward change, they might have aligned with one or the other thus dividing loyalties and creating disparate motivation levels among fellow teachers.

A principal noted that he always tried to let teachers leave his office knowing the next steps to take for their problems or projects. He specifically identified Blanchard's *The One Minute Manager Meets the Monkey* (1991) as a governing concept for his office interactions. He described figuring out how not to make a simple problem too complex, and how to deal with small issues quickly. This insight would

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

have served the librarian well, since she could have used a model which helped teachers help themselves. Teachers could have come to the librarian or other project leaders to brainstorm their next moves, rather than turning to a parental figure for help in solving the problem for them (essentially giving up and awaiting rescue, a common behavioral pattern).

The principal also explained that he was cautiously optimistic about information received in his office, preferring to investigate certain things himself rather than jumping to conclusions based on the emotions or stress of the person bringing the problem. This is a skill the librarian often displayed but could not maintain after months of challenging emotional student and teacher interactions surrounding the initiative. The superintendent stated that finding the time and energy to point others in the right direction a demanding part of his job. Similarly, "the system" often didn't allow him or his fellow administrators any time to think about a problem, and this was reported as a similar experience for the librarian and teachers alike.

LEADING FUTURE INITIATIVES

Leaders were asked to "Describe your decision-making process. For example, when your staff/group brings to your attention a problem, how do you go about selecting a solution?" All of the school administrators described a process where they collected information from a variety of sources. The principal explained how he delineates the merits and drawbacks of possible solutions. The superintendent explained how he steps back and looks at the situation and then analyzes it based on the goals that have been set and the people he has to help reach those goals. Unfortunately, based on their answers, it is possible that none of the Moodle project proponents spent time in any of these decision making stages.

All four leaders explained that decision-making was a thoughtful process, not one done quickly. One specified that leaders should not make decisions quickly just to impress others. Another specifically mentioned his preference for "seeing it for himself" and for uncovering all of the facts, especially before making decisions that will have a ripple effect on other things. Yet another described in great detail his process for identifying the urgency or immediacy of a problem and the importance of the problem.

The assistant principal also explained his method of identifying the type of reactions or interactions among staff, and the underlying conditions that often exist. For example, frustration could belie a lack of resources, a lack of structure or a lack of opportunity. All three of these challenges were present in the Moodle implementation project, and could have even been predicted, with brainstorming done in advance to list possible solutions or resource/structural changes which would create more opportunities for teacher participation. None of the project's pre-planning involved these purposeful steps.

The superintendent offered a structure he used to determine his course of action. It included three aspects of his job that must be juggled at once: a) the functioning of the organization, in other words maintaining operations; b) moving the organization forward, or constantly improving; and c) helping the staff perform their functions better. He described situations where he feels he is teaching the staff and administrators every day, while trying to keep all three aspects in view. Project participants might have felt more supported if they communicated feedback about these three things more regularly to the school leaders.

Much of what these four leaders said was similar in content. Their attentions as leaders to understanding and analyzing different stakeholders, viewpoints and information were paramount. They each showed a propensity to favor situational leadership, and to provide thoughtful and patient arrival at

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

decisions or conclusions. In these ways, they are likely similar to administrators in most school districts around the country, so the potential for critique in this case may potentially be cross-applied to many other organizations.

Naturally, when seen under a microscope, these answers told much more about the leaders and their belief structures than the question-and-answer format reveals on the surface. The leaders also transmitted a variety of attitudes, inconsistencies, and incongruence, especially when their answers to certain questions were compared. Perhaps one was astute in having mistrust for questions three and six; perhaps he knew that related associations were being teased out of him but did not see clearly, or could not reveal to the librarian, the connections he suspected. If even one staff member feels these disconnects, then it is possible they are affecting the whole organization.

In response to question one about their leadership style, it appeared that a few of the leaders could not articulate more than a surface definition of situational leadership. The principal saw it as a reaction to the situation, one which he had to solve for himself. He did not reference the employees whom he could have collaborated in order to solve the problem. This top-down sense of management was evident in the Moodle project even if simply it was the style of interaction for the organization. Perhaps this is why cross-group collaboration tended to wane, and a leader was continually requested to provide solutions.

If situational leadership is both directive and supportive (Northouse, p. 87), then perhaps the principal was missing the latter. "To determine what is needed in a particular situation, a leader must evaluate her or his employees and assess how competent and committed they are to perform a given task" (Northouse, p. 87). Then, the leader changes his or her level of direction or support given the employee's needs. None of this surfaced in the discussion of the Moodle project, but perhaps more focus on the supportive nature of management and leadership would help the project in future rounds.

In contrast, the superintendent was able to articulate some of the complexities of utilizing a situational leadership approach during the Moodle implementation. He described theories of coaching, decentralized leadership, his role in training other leaders, and circumstances under which he could not apply the situational model. His analysis was, in an obvious way, more "big picture," due to his broader role in the organization, his years of experience, and his teaching of coursework related to the question.

As the most experienced school administrator among the group, the superintendent displayed a remarkable difference from the others in his ability to explain or articulate the integration of the theoretical structures he knows as applied to his actions. This made his leadership style seem more like a "thinking" one than a "feeling" one, and he did not solely focus on his personal philosophies as they had evolved over time. This distancing from personal philosophies in order to provide the group with the proper type of support they need (and at the time they need it) is indeed a higher level skill required for similar or subsequent initiatives.

Regarding the characteristics in subordinates that the administrators valued, almost all leaders ended up talking about themselves as subordinates for most of the time rather than about others they supervise. Even the superintendent saw himself as a subordinate of the Board of Education and discussed many of his examples in this manner. The assistant principal expressed his "wish list" for his employees, going into great detail about how they should comply, follow the chain of command, and preserve the organizational structure.

While honest, these types of responses also reveal that some administrators want a more cooperative or "easy" staff, and is most likely dissatisfied with something of this nature that has happened recently or is on his mind (it is unclear if the Moodle project was the source of his discontent). Strangely, much of the leaders' responses to this question focused on traits they described for others but not the same traits

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

they valued in themselves from question one. While the librarian felt embarrassed at the suggestion that she was trying to entrap the leaders, these few interview questions uncovered potential changes in support or supervision of the project which likely could have been averted through more detailed advance planning on her part, either with or without them.

The principal mentioned instances of his subordinates bringing "thoughtful opposition" to him, yet he spoke for the rest of this answer about how he and his fellow administrators try to get rid of the dissonance between them as quickly as possible and try to present a united front to the staff. While this is a good idea, if he really valued thoughtful opposition, he would model the process of negotiating through that with his coworkers and staff. It appears that not much discussion or negotiation about how to approach the Moodle project happened in advance, either among leaders themselves, or among the initial group of early adopter teachers and their librarian.

He also said that he valued initiative and loyalty; but, he ended this answer by stating that his subordinates need to do what is best for the organization. He noted that sometimes the teachers' ideas might be good, but just good for someone else [another organization]. He explained that the initiative and innovation he said he seeks is often seen as misguided. Although he did not think the Moodle project was misguided, he agreed that perhaps it could have been rolled out in a different way. Unfortunately, he did not detail this new way or seem concerned that the current implementation was a bit rocky.

Another curious connection occurs between these leaders, since some of them were subordinates of each other. In one answer, the assistant principal included details about how he values an employee's ability to take in a diverse array of opinions and motivations and decide what is really going on in a situation. This is almost completely analogous to the superintendent's answer to this question, in which he describes his ability to assess a situation and prescribe a style of leadership appropriate to it. As such, any potential concern about dissonance between the administrators is not entirely true, since they clearly align on some approaches.

One administrator described the practical value of leading others, in being willing to step into other people's shoes and see what is productive and beneficial to the organization. At times, when mentioning this topic, nearly all of the leaders seemed to be reminiscing about the past. They often discussed decisions or decision-making processes for general events that had happened already, rather than giving specific examples from the current Moodle project, even when prompted to specifically do so. All talked about challenges they faced as new leaders, to grow and develop in their role, rather than on specific types of interactions with employees.

Only the assistant principal revealed that he followed a flow-chart type of decision-making process, which almost seemed like a structure that resided in his head. He determined the nature of a problem, with formulaic precision, and then applied the resultant "fixes" that matched his analysis. He was quite confident and excited about this model, which he described in such detail that the interviewer started drawing a figure that looks like a Johari window with panes that are labeled Urgent/Important, Urgent/ Not Important, Not Urgent/ Important, and Not Urgent/Not Important. His memorization skills for remembering the symptoms of employee dissatisfaction and their underlying causes were impressive.

While humor was not discussed at all as a strategy or an observed behavior by any participant during the Moodle project, it may have helped to uncover some teachers' biases or helped to develop an environment of trust for conversations about larger change issues. Admittedly, the school community may not have been ready at the time for that depth of discussion, or with the Moodle project as its impetus. Nevertheless, Connor (2000) would be proud that this superintendent was indeed the chief role model for

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

his organization, and was having conversations with his employees, leaders and followers who "should discuss publicly their own experiences and share what they have learned" (p. 42).

There seemed to be a marked difference in the responses of new leaders to the project as opposed to those of the veteran leaders. Specifically, differences in leadership style, methods of conflict or problem resolution, or valued characteristics might have been apparent to their constituents as well, which naturally colored everyone's experience of the learning management system implementation. Tager (2004) would agree that "demonstrating empathy is an observable, measurable leadership behavior" and that during stressful times it may be "the single most important factor in reengaging people and moving them to higher levels of performance" (p. 8).

At the same time, the leaders were more similar than expected on certain issues. What differed was the depth and intricacy of their responses, with the veterans providing fuller pictures of themselves and the complex reasons behind what they do and believe. This particular piece is consistent with novice/expert learning theory as well, if we view the leaders as learners of leadership (Bransford, et. al., p. 18). Overall, the leaders had more in common than they differed; a true measure of their common qualities which led them to these positions … whether they were born that way or not!

CONCLUSION

As a learner, the early stages of the project were fulfilling for the school librarian. She reported that she was able to easily learn how to set up and administer the Moodle package, for which there was much help available to me online through the open source community. In participating in the Moodle admin community for the first time, she was grateful for Moodle's help pages and discussion forums, and for the graciousness of several experienced Moodlers who helped her via email and at conferences. The project ended up being a success for the students, who were excited about the new learning platform and brought some of their reluctant teachers into adoption of the tool through their incessant requests.

As a teacher, the school librarian was naturally comfortable with sharing her learning struggles publicly, since this was often how she modeled research for others. She believed that if she could convince others through display of her own attempts (both failures and successes), she could influence real change. Thankfully, her early efforts did have positive effects on the school; over 350 students, faculty and parent users had signed up and were using Moodle during its first month of operation. But, they soon learned that even with a team of a dozen or more early-adopter teachers, they could not keep up with the "new content" demand of newly skilled users.

Students were a key factor in the success of the project. When the librarian began referring teachers to each other, or to the students, she made herself less of an expert and less reliable as their "emergency personnel." Although she held user groups instead of workshops before school, at lunch, or after school, she increasingly allowed the content of the workshop to be determined by the users themselves. She vowed to have "beginner user groups" and "intermediate user groups" next time, perhaps. Examples of student work products from the early adopters' classes would be compelling reasons to carry on, even if teachers needed to be reminded of this at the start of the new school year.

The next challenge, she determined, would be to get teachers to integrate Moodle use into their daily workflow. And all must remember that adoption of a new tool takes a really long time! The librarian may be able to partner with someone who is better at encouraging sustained use, or who can be the cheerleader who rallies everyone toward the cause. The librarian may have been skilled enough to get

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

folks excited enough to try a tool, but then she may have lacked the patience to stay with them during the slow initial acquisition of skills. In a massively personalized world, partners would likely have been more successful than small groups.

Although support staff felt as if the implementation phase was chaotic, they did their best to assist with many teacher questions about technical difficulties. Many IT gatekeepers, who hold no more advanced knowledge than typical trial-and-error Moodlers, are often reluctant to disclose their knowledge levels about an unfamiliar tool. But as everyone acquires more tech savvy skills, the information technology workers may feel less nervous about becoming obsolete or outsourced. Although the school technology specialists were relieved to not be a part of this Moodle implementation project since they felt overwhelmed with their current workload, they were supportive and promoted the Moodle service regularly and appreciated having a new group of tech savvy personnel on site.

In conclusion, this technological challenge may not have been about technology at all, but rather about managing change. As project leaders work on influencing others better, and on more detailed planning of tactics and strategies, future progress should retain momentum. In convincing teachers of the value of spending time in learning new skills, school leaders should focus more on why to use Moodle rather than on how to use Moodle. This will allow teachers with varying levels of sophistication to all experience success in the initiative, and not focus them attaining on mastery of all skills. The ultimate beneficiaries of teacher professional development in technology is student engagement and success which -- it turns out -- is not a technological problem at all.

REFERENCES

Abbitt, J., & Davis, D. (2010). The prevalence, perceived barriers and benefits of open source software in K-12 public schools in southwest Ohio. In D. Gibson & B. Dodge (Eds.), *Proceedings of SITE Conference 2010* (pp. 1296–1300). Chesapeake, VA: AACE. Retrieved from http://www.editlib.org/p/33536

Aristovnik, A., Tomazevic, N., Kerzic, D., & Umek, L. (2017). The impact of demographic factors on selected aspects of e-learning in higher education. *International Journal of Information & Learning Technology*, *34*(2), 114–121. doi:10.1108/IJILT-09-2016-0045

Baumgartner, P., Naust, V., & Canals, A. (2007). *Open educational practices and resources: OLCOS roadmap 2012.* Retrieved from http://hdl.handle.net/10760/9178

Bennis, W. (2002). Become a tomorrow leader. In L. C. Spears & M. Lawrence (Eds.), *Focus on leadership: Servant-leadership for the 21st Century* (pp. 101–109). New York: John Wiley & Sons.

Blanchard, K. H., Oncken, W. Jr, & Burows, H. (1991). *The One Minute Manager Meets the Monkey*. New York: William Morrow & Co.

Bondy, E., Shannon, D., Eda, M., & Munarriz-Diaz, R. (2017). Recentering job-embedded graduate education for practicing teachers. *Teacher Education and Practice*, *30*(1), 38–57.

Bransford, J. D., Brown, A. L., & Cocking, R. R. (Eds.). (1997). *How People Learn: Brain, Mind, Experience, and School*. Washington, DC: National Academy Press.

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

British Educational Communications and Technology Agency (BECTA). (2005). *Open source software in schools: A study of the spectrum of use and related ICT infrastructure costs*. Coventry, UK: BECTA. Retrieved from http://www.openskm.com/doc/ oss_study_spectrum.pdf

Collins, J. C. (2001). *Good to great: Why some companies make the leap-- and others don't*. New York: Harper Business.

Connor, J. C. (2000). It wasn't about race. Or was it? *Harvard Business Review*, *43*(2), 37–46. PMID:11143153

Deepak, K. C. (2017). Evaluation of Moodle features at Kajaani University of Applied Sciences: Case study. *Procedia Computer Science*, *116*, 121–128. doi:10.1016/j.procs.2017.10.021

Dolch, C., & Zawacki-Richter, O. (2018). Are students getting used to learning technology? Changing media usage patterns of traditional and non-traditional students in higher education. *Research in Learning Technology*, *26*(0), 1–17. doi:10.25304/rlt.v26.2038

Essel, D. D., & Wilson, O. A. (2017). Factors affecting university students' use of Moodle: An empirical study based on TAM. *International Journal of Information and Communication Technology Education*, *13*(1), 14–27. doi:10.4018/IJICTE.2017010102

Fitzgerald, B. (2011). Open source software adoption: Anatomy of success and failure. In S. Koch (Ed.), *Multi-disciplinaryadvancement in open source software and processes* (pp. 1–23). Hershey, PA: IGI Global. doi:10.4018/978-1-60960-513-1.ch001

Foster, D. L. (2011). *High school students' perceptions of innovative instructional options at a California charter school: A multiple case study* (Doctoral dissertation). Capella University. (AAT3434731)

Fryer, L. K., & Bovee, H. N. (2016). Supporting students' motivation for e-learning: Teachers matter on and offline. *The Internet and Higher Education*, *30*, 21–29. doi:10.1016/j.iheduc.2016.03.003

Goleman, D. (1998). What makes a leader? *Harvard Business Review*, *23*(1), 82–91. PMID:10187249

Greenleaf, R. K. (1977). Essentials of servant-leadership. In *Focus on leadership: Servant-leadership for the 21st Century* (pp. 19–25). New York: John Wiley & Sons.

Hepburn, G., & Buley, J. (2006). Getting open source software into schools: Strategies and challenges. *Innovate (North Miami Beach, Fla.)*, *3*(1). Retrieved from http://www.innovateonline.info/ index.php?view=article&id=323

Jeljali, R., Al Naji, L., & Khazam, K. (2018). A comparison between Moodle, Facebook, and paper-based assessment tools: Students' perception of preference and effect on performance. *International Journal of Emerging Technologies in Learning*, *13*(5), 86–99. doi:10.3991/ijet.v13i05.8091

Kumar, V., & Sharma, D. (2016). Creating collaborative and convenient learning environment using cloud-based Moodle LMS: An instructor and administrator perspective. *International Journal of Web-Based Learning and Teaching Technologies*, *11*(1), 35–51. doi:10.4018/IJWLTT.2016010103

Li, Y., Tan, C.-H., Xu, H., & Teo, H.-H. (2011). Open source software adoption motivations of adopters and amotivations of non-adopters. *ACM SIGMIS Database*, *42*(2), 76–94. doi:10.1145/1989098.1989103

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

Liang, X., Ward, C., & Xiao, Y. C. (2008). Enhancing technology use through open source software: Initial findings. *Proceedings of World Conference on E-Learning in Corporate Government Healthcare and Higher Education 2008*. Retrieved from http://www.editlib.org/d/29741/proceeding_29741.pdf

Midha, V., & Palvia, P. (2012). Factors affecting the success of open source software. *Journal of Systems and Software*, *85*(4), 895–905. doi:10.1016/j.jss.2011.11.010

Nair, I., & Das, M. V. (2011). Analysis of recent studies undertaken for assessing acceptance of technology among teachers using TAM. *International Journal of Computers and Applications*, *32*(8), 38–46.

Neff, T. J., & Citrin, J. M. (2005). *You're in charge -- Now what?* New York: Crown.

Northouse, P. G. (2004). *Leadership: Theory and Practice* (3rd ed.). Thousand Oaks, CA: Sage Publications, Inc.

Pfaffman, J. (2008). Transforming high school classrooms with free/open source software: It's time for an open source software revolution. *High School Journal*, *91*(3), 25–31. doi:10.1353/hsj.2008.0006

Santos, I., & Carvalho, A. (2017). Training and monitoring: A two-stage training model in teacher professional development. *Educação e Realidade*, *42*(1), 323–344. doi:10.1590/2175-623655298

Senge, P. M. (1994). *The fifth discipline: The art and practice of the learning organization*. New York: Doubleday/Currency.

Senge, P. M. (2000). *Schools that learn: A fifth discipline fieldbook for educators, parents, and everyone who cares about education*. New York: Doubleday.

Tager, M. J. (2004). What people really need from a change leader. *Leader to Leader*, *21*(4), 6–9. doi:10.1002/ltl.56

Ueda, H., & Nakamura, M. (2016). GakuNinMoodle: Toward robust E-learning services using Moodle in Japan. *Procedia Computer Science*, *96*, 1710–1719. doi:10.1016/j.procs.2016.08.219

Waheed, M., Kaur, K., Ain, N., & Hussain, N. (2016). Perceived learning outcomes from Moodle: An empirical study of intrinsic and extrinsic motivating factors. *Information Development*, *32*(4), 1001–1013. doi:10.1177/0266666915581719

Wright, N. (2015). A case for adapting and applying continuance theory to education: understanding the role of student feedback in motivating teachers to persist with including digital technologies in learning. *Teachers and Teaching, 21*(4), 459-471.

Yildiz, E. P., Tezer, M., & Uzunboylu, H. (2018). Student opinion scale related to Moodle LMS in an online learning environment: Validity and reliability study. *International Journal of Interactive Mobile Technologies*, *12*(4), 97–108. doi:10.3991/ijim.v12i4.9205

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

ADDITIONAL READING

Bovermann, K., Weidlich, J., & Bastiaens, T. (2018). Online learning readiness and attitudes towards gaming in gamified online learning: A mixed methods case study. *International Journal of Educational Technology in Higher Education*, *15*(1), 1–17. doi:10.118641239-018-0107-0

Boyer, B. (2015). Designer librarian: Embedded in K12 online learning. *TechTrends*, *59*(3), 71–76. doi:10.100711528-015-0855-9

Coleman, S. (2015). *Acceptance of technology innovations in public education: Factors contributing to a teacher's decision to use free and open source software.*

Doctoral dissertation, Alliant International University. AAT 3701746.

Goleman, D., McKee, A., & Boyatzis, R. E. (2002). *Primal leadership: Realizing the power of emotional intelligence*. Boston: Harvard Business School Press.

Kampa, R. K. (2017). Bridging the gap: Integrating the library into Moodle learning management system: A study. *Library Hi Tech News*, *34*(4), 16–21. doi:10.1108/LHTN-11-2016-0055

Marzano, R. J., Waters, T., & McNulty, B. A. (2005). *School leadership that works: From research to results*. New York: ASCD.

McKenna, P. J., & Maister, D. H. (2002). *First among equals: How to manage a group of professionals*. New York: First Press.

KEY TERMS AND DEFINITIONS

Change Management: The process by which leaders manage emotions, artifacts, and processes in implementing a new initiative or project.

Leadership: Any school employee who influences decisions and activities; usually a school administrator, but often a teacher or librarian who does not have a formal administrative titles but who has unique or significant job responsibilities or knowledge for the initiative or project at hand.

Learning Management System: An online, networked curriculum delivery tool which can be accessed by students and teachers simultaneously via the Internet, 24 hours a day and 7 days a week.

Moodle: A freely available, open source learning management system used by some schools in the United States and abroad to hold course documents, facilitate online discussion forums, and share information among specified students and their teachers.

Online Learning: The activity by which students access materials for their studies and homework online, usually in an asynchronous environment which is set up by one or more their teachers, and accessed largely outside of the traditional school day.

Professional Development: The often formal and sometimes informal process by which teachers learn new skills, procedures, or information related to job duties and/or improvement of job performance.

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

School Administrators: The decision-making authorities from the school district; in this instance, officially titled positions such as executives (superintendents), managers (principals), directors (assistant principals), or department heads (usually teachers who take on additional responsibilities for peers in their subject areas.

Teachers: The users of the learning management system; in other words, the high school instructors in this case who needed to adapt their teaching styles and course delivery to include online asynchronous components offered by Moodle.

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

Chapter 9
Digital Storytelling, Podcasting, and New Format of Messaging in the Libraries

Adebayo Muritala Adegbore
University of Ibadan, Nigeria

ABSTRACT

This chapter discusses how to transform storytelling, oral information, oral archiving, and oral communication and other traditional formats of communication in libraries into digital formats. Information and communication technologies have changed how libraries communicate and render services as hitherto done traditionally. The chapter looks at traditional storytelling, traditional folklore, oral information, and information dissemination in libraries. It also defined digital storytelling, values of digital storytelling in libraries, digital storytelling creation guidelines for libraries, podcasting and the importance of podcasting in libraries, steps in creating podcast for libraries, instant messaging in information dissemination in libraries, what libraries should know before implementing instant messaging, implementing IM in libraries, best practices for IM in libraries, and more resources on instant messaging for libraries. The chapter is handy for libraries that are willing to transform some traditional services to digital-driven practices.

INTRODUCTION

Library users are becoming more and more technology savvy and library services are simultaneously emerging to suit the information needs of the ever-changing society. To keep abreast of its traditional role of information provision and preservation for posterity, libraries have to metamorphose its hitherto traditional methods of information dissemination to digital formats. Some of the traditional services being provided in the library are gradually and systematically being phased out particularly in African libraries due to the antediluvian method these libraries still rendering such services (for the few who still does), making it to be boring and uninviting to the library users and as well strenuous to the librarians who render such services. Some of such services are storytelling, oral information, oral communication, oral archiving and information generation and dissemination.

DOI: 10.4018/978-1-5225-9034-7.ch009

Copyright © 2020, IGI Global. Copying or distributing in print or electronic forms without written permission of IGI Global is prohibited.

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

Storytelling is one of the primitive services rendered by libraries. The main aim is to pass on the culture, values, ethos, philosophy, beliefs, and ethics etcetera of a community from generations to generations. Libraries play the institutional role of being looked upon to the training support needed for every child to develop and be useful for himself and the society at large. Thus, storytelling becomes one of the services rendered by libraries to support child upbringing and as well a means of recreational activities even for the adults and the general public. Libraries have also and still playing the role of community information centre where the librarians are seen as gatekeepers of information.

In addition, oral information, history and archiving are also a means by which the library collects, process, preserve and disseminate a variety of indigenous knowledge. These are the basis for local-level decision-making in many rural communities. It has value not only for the culture in which it evolves, but also for scientists and planners striving to improve conditions in rural localities. Ola and Adegbore (2015) reported that most indigenous knowledge generated by course programmes in the Department of Library, Archival and Information Studies and the Institute of African Studies of the University of Ibadan as well as the University's museum were not adequately preserved, conserved and disseminated. Therefore, the traditional means of oral information dissemination has evidently been overwhelmed by the amount of numbers of resources being generated which are to be disseminated for access and utilisation.

In this information age, libraries are expected to carve a niche for themselves in the generation and dissemination of timely and adequate information needed by clients to make informed decision. In so doing, they need to get ahead of users and other media platforms in order to remain relevance in the comity of information organisations. Libraries traditionally generates information ranging from but not limited to current awareness services, selective dissemination of information, public announcement, new arrival notices, book list generation for resource verification exercises, conference and workshop information, call for paper (academic publications) announcement etcetera.

However, decline is evident in the confidence people have in the library nowadays. Libraries are now being deserted as its services are no more appealing to library users due to the primitive style of rendering such services. According to Kwanya (2011), there have drastic change in the environment in which libraries currently operates. The emergence of new information and communication technology, particularly the internet has changed the information behaviour (i.e information seeking, communication and collaboration) exhibited by people. People who were hitherto primarily relying on the library to quench their information thirst now majorly look towards the internet for instance.

Thus, modern library users have embraced new information seeking behaviour as well as expectations for better usability, faster response times to needs, and constant access to unrestricted library services. As libraries struggle to cope with these changes and user expectations, some library users are already reducing their levels of usage, preferring "Google" than visit a physical library. Similarly, library circulation statistics indicate that the usage of the traditional services and products is decreasing steadily while the usage of electronic resources and services is increasing. Critically, most users do not presently perceive the library as the first or only stop for information. Libraries are therefore struggling to attract new users and retain the existing ones (Salubi, Ondari-Okemwa, Nekhwevha, 2018). This paper therefore x-rayed how web 2.0 facilities can be useful in rendering storytelling, broadcasting and messaging in the 21st century library.

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

TRADITIONAL STORYTELLING IN LIBRARIES

Traditionally, libraries particularly the public libraries engage in storytelling activities especially for children. Libraries' story hour is one of the most sought after for children and parents with the ultimate aim of keeping the children busy and at the same time teaching them the societal values. The emergence of Children Librarianship in the late 19th century brought about story telling in libraries. Stories were used as a way to keep young people's attention and have always been used as way to pass down folklore and history before it was written down in books. Storytelling brings a library's collection alive and it is seen to be a beautiful method of making information or data meaningful. Companies often deployed storytelling to promote the sale of their products and services while public speakers have equally used storytelling to captivate their audiences' attention.

According to Lucarevschi (2016) storytelling is an art that involves beautiful rendition of stories in order to engage an audience. The storyteller conveys a message, information and knowledge, in an entertaining way. Literary techniques and non verbal language are the storytellers' tools. Isbell, Sobol, Lindauer and Lowrance (2004) posits that storytelling is one of the oldest forms of human communication, and much has been said in the literature about its effectiveness as a pedagogical tool in the development of language skills in first language, and also in a foreign or second language, regardless of learners' age or background. Storytelling could therefore be summarized to mean a setup or standard routine with regards to sharing information, deciphering encounters, or passing on the aggregate knowledge of the way of life to others through the methods of oral portrayal, composed word, or representations. Not all, but rather most stories highlight a starting, middle, and end.

Storytelling has a long and varied history in various libraries, beginning from the first storytelling coordinator at the public library of New York in the 20th century to the contemporary adolescents rendering personal stories at the public library in Chicago and the modern day academic libraries of the developed countries collecting and preserving the history of the development of nations and that of refugees and immigrants. Storytelling as a library service therefore developed and got to a point of reference where some library schools even offers storytelling and folklore as a course to be taken by library and information science students due to its inherent and numerous advantages (Dushu, 2016).

Libraries are institutions of formal and informal learning where storytelling helps in achieving some of the educational objectives. The inclusion of storytelling in the libraries' programme will attract more people. Some of the values of storytelling in libraries includes the fact that storytelling is both tangibly and intangibly unique and can be simultaneously explored. Storytelling has also been found to build bridges between near and far in both time and space, which made it possible for the listener to time travels into assortment of places and times. It is also a way of creating in the mind of listeners, unimaginable images through words of mouth and rich experience could be created through triggering of imagination and memory.

One of the popular events in children's section of the library is storytelling, it encourages preschool to use and enjoy the library as well as luring holder children to the library during school holidays. In the past and until recently, part of school programmes usually includes the allocation of time to students or pupils to visit the library as a class to their local library in order to encourage them to use the library for assignments (homework), while storytelling presents the library as a place of entertainment as well as of learning. It is also accessible to a diverse audience, it helps people with a variety of learning disabilities to enjoy and understand the treasures of literature and folklore.

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

Storytellers are important contributors to sustaining culture, by preserving and perpetuating intangible heritage through the oral tradition. Storytelling events might be used to encourage a variety of ethnic groups into the library using storytellers steeped in their culture. The telling of Stories was important in pre-industrial Britain. There are large collections of stories about characters from history that can inform teaching and enhance local history collections. If allowed to assist with the construction of narratives within the library framework, communities can feel more of a sense of 'ownership of the collections'. Stories appeal to a wide age range and some libraries have had great success in building programmes of adult storytelling in the evenings (Ginaka, 2007). The importance of storytelling to the existence of the library and maintaining its relevance in the community cannot be overemphasised.

Traditional Folklore, Oral Information, and Information Dissemination in Libraries

Traditionally, folklore is associated with information about people with at least one common factor. The factor in question is associated and could not be dissociated from the groups' way of life. Folklore is the expressive collection of culture shared by a specific gathering of individuals; it envelops the conventions regular to that culture, subculture or gathering. These incorporate oral conventions, for example, stories, axioms and jokes. They incorporate material culture, going from customary building styles to carefully assembled toys normal to the gathering. Legends additionally incorporate standard legend, the structures and customs of festivities, for example, Christmas and weddings, people moves and commencement rituals. Every last one of these, either independently or in the blend, is viewed as legends antique. Similarly, as basic as the frame, old stories likewise includes the transmission of these antiquities starting with one area then onto the next or starting with one age then onto the next. Folklore is not something one can normally pick up in formal school educational programmes or concentrate in the expressive arts. Rather, these conventions are passed along casually starting with one individual then onto the next either through verbal guidance or show. The scholastic investigation of old stories is called Folklore studies, and it tends to be investigated at undergrad, graduate and Ph.D. levels (Bauman, 2008).

Bronner (2006) identified various types of folklore to demonstrate the large range of the field of study. His list includes the expected subjects of folktales, legends, myths, ballads, festivals, folk dance and song, but also offers examples of folklore that may not be as obvious, such as children's counting out rhymes, food recipes, house, barn and fence types, latrinalia (informal writings in public restrooms), as well as the sounds traditionally used to call specific animals. Bronner stressed that his list is not exhaustive, but merely a sampling of the subjects that folklore scholarship can address, and which merit study for the insight that they provide into specific cultures. In libraries, folklore is considered as one of the very important resources. Clearly, analyzing and improving folklore collections in libraries allows librarians and school to build collections that support peoples' reading in the genres that motivate people to explore more their cultural values and history.

Another resource of the library that is of utmost importance is oral information. Oral information is typically considered informal as opposed to formal (Turner 2009), which refers to how it becomes available from social situations (Case 2007). Informal information emerges in information sent via electronic mail messages; leaflets mailed via postal carrier; information printed in advertisements; stories that appear in newsletters; and, conversations between colleagues, family members, or friends. A great deal of research relies on analytical techniques that involve oral data. Increasing our understanding of oral information can improve results produced from using these techniques because it would enable more

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

informed interpretations of information conveyed orally. In human-computer interaction, oral information plays a crucial role in gathering data. The importance of orality is noted in how researchers consider oral information to be a natural interface between computers and those who use them.

Most empirical investigations that identified oral information do as such in their examination discoveries. A couple of studies centre on the utilisation of oral information in their examination question(s). Foster (2009) reported that specific structures and elements of oral information developed to encourage community oriented information seeking and utilisation. McKenzie (2010) recognises that oral information, explicitly rehashed circumstances of casual banter among midwives and childbearing ladies, gives a pivotal asset to building and developing those connections. Tuominen (2004) examines the rambling practices of heart surgery patients. He recognises manners by which oral information about wellbeing data seeking and shirking is utilised to reflect suitable and moral conduct of sick people and their hale others. Another investigation found that managers in data organizations (libraries, exhibition halls and so forth) utilises oral information as an apparatus for reporting data (Turner 2009).

Information dissemination or better put, information literacy in libraries facilitates appreciation of libraries and its resources by clients. How libraries informs its clients goes a long way to ensuring that its users better understands and make use of its resources, promotes it and ensures its continual existence. Notice boards, news bulletin, personal letters, public announcement through handbills, posters, and etcetera were the ways libraries traditionally disseminates information. According to Ashikuzzaman (2017), it is important that librarians knows the right information services to provide in order to satisfy information needs of library users. The traditional current awareness service (CAS) and selective dissemination of information (SDI) services rendered by libraries are as follows:

- Display of newly acquired materials on the display racks in the library for people to view it.
- Display of table of contents of newly acquired books and pasted on the notice board at strategic places.
- Newspaper cuttings arranged in an album or in a file in an office cabinet. Creating this awareness helps researchers and library users to have access to current information and development in their area of interest.
- Alerting heads of department when new materials in special areas for some departments are acquired. The libraries inform the faculty members through their heads of department about the new materials acquired that might be useful to their courses of study.
- Compilation of bibliographies, reading list, indexing and abstracting of books.
- Publishers also engage in CAS and SDI when new books are produced and their catalogues sent to their various departments, showing them new publications from their company. The catalogue could be general one containing all the publications and it could also be on subject area. Compilation of bibliographies in different subject areas are prepared and displayed on the shelves for uses to consult.

STATEMENT OF THE PROBLEM

Like every organisations, libraries are challenged with the advent of information technologies which confronts the way services are being rendered. The traditional systems and methods of information dissemination in the library no long appeal to users. Newspaper section, library story hour, circulation

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

(borrowing and lending of library materials) of the libraries are going into extinction. Adegbore (2011) posited that e-resources of the library will continue to enjoy wider acceptance among users as the future unfolds and barriers to the use of electronic resources are reduced. Currently, e-resources of the library are being updated and made to be more appealing to readers, there by relegating into the background resources and services which are still being rendered traditionally.

This situation is responsible for the neglect of some services of the library such as storytelling, oral information and communication, and other information services of the library. It therefore necessary to focus on how these very useful library services could be resurrected and rebranded through the use of emerging technologies. It is against this background that this paper espouses digital storytelling, podcasting, and instant messaging in libraries.

DIGITAL STORYTELLING DEFINED

According to the digital storytelling pioneer Dana Atchley,

...digital storytelling combines the best of two worlds: the 'new world' of digitized video, photography and art, and the "old world" of telling stories. This means the "old world" of PowerPoint slides filled with bullet point statements will be replaced by a "new world" of examples via stories, accompanied by evocative images and sounds. (presentationzen.com, 2005)

Wilson (2018) viewed digital storytelling as a short story produced through the process of combining a recorded narrative with images (still or moving), and music or other sounds. This is usually between two to three minutes long (i.e in length). The structure of communication can be in the first person, about a person, issue or the event that strongly affects the feelings of the narrator. The process of digital storytelling recognises, typically, many storytelling elements which include oral tradition, the writing process, the power of visuals, and the role of digital media in recording and sharing stories. These stories are about people, places and situations that are not told often. They can be transformational, as we are invited to see events, places and people from a new perspective and experience them in a new way. The author equally characterised digital stories as short, personal, multimedia anecdotes written based on feeling and usually in the first person. The recommended features of digital storytelling is strictness to two hundred and fifty (250) words with about twelve pictures and not more than about two minutes in order to have a truly digital storytelling.

Digital storytelling is the practice of using computer-based tools to tell stories with the focus on a specific topic and a particular point of view. It is also seen as the modern expression of the ancient art telling stories (Barrett, 2007). As is the case with traditional storytelling, digital stories revolve around a chosen theme and often contain a particular viewpoint (Robin, 2008). According to Robin (2008), digital storytelling mixes the art of storytelling with a diverse digital multimedia including images, audio and video. Just about all digital stories bring together some mixture of digital graphics, text, recorded audio narration, video and music to present information on a specific topic.

Three major categorisation of digital storytelling has been established, though there are different types of digital storytelling based on forms and contents. The three major categories of digital storytelling are:

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

1. **Personal Narratives**: Stories that contain accounts of significant incidents in one's life. Personal narratives are stories you tell from your own life experiences. A personal narrative can focus on any event, whether it is one that lasted a few seconds or it spanned a few years. Your topic can reflect one's personality, or it can reveal an event that shaped people's outlooks and opinions. But the story should have a clear *point*.
    a. One could write about a learning experience that challenged and changed him/her
    b. One could describe a new discovery that came about in an interesting way
    c. One could write about something funny that happened to one or one's family
    d. One could write about a lesson one learned the hard way etcetera
2. **Historical Documentaries**: Encyclopedia Britannica (Britannica Academic, 2017) defines documentary film as a "motion picture that shapes and interprets factual material for purposes of education or entertainment". Therefore, historical documentaries are stories that examine dramatic events that help us understand the past, it is also seen as a film or television or radio programme that gives facts and information about a subject and an art of giving facts and information about a subject in the form of a film or television or radio programme. Historical documentaries sources may be defined loosely as records relating to individuals or groups of individuals that have been generated in the course of their daily lives.

As far as librarianship is concerned, historical documentaries have been seen as a form of archival materials or archival inquiry. According to Kridel (2018), historical documentary milieu as a form of archival inquiry seems most pronounced in the area of history with many curriculum historians working extensively with primary documents. It is a very rich source of primary data in the area of social sciences, arts and humanities. Historical documentaries for libraries may equally be sources of data for qualitative research, with its emphasis upon generating data through various means of inquiry, the use of extant documents from the past and present seem somewhat overshadowed. Yet, the fields of humanities, arts, and social sciences maintains a longstanding and popular tradition of documentary inquiry and, with continual evolution of hybrid and virtual documentary sources from the internet and email, this form of data, evidence, and documentation will become more commonplace as qualitative and quantitative researchers recognize that they must appraise and ascertain the provenance of information (McCulloch, 2004). From this perspective, material culture takes the form of documentation, falling into basic categories of personal, public, and official documents. Personal historical documentaries include correspondence, journals, autobiographical writings and memoir. Public historical documentaries typically comprise published and publicly presented documents including newspapers-magazines, flyers, books, etc. Official documentation includes administrative documents representing agencies and organizations.

3. **Conceptual or Practical Stories**: Designed to inform or instruct the viewer on a particular concept or practice. This is the usage of stories in a practical and direct way. The theory of the use of conceptual and practical stories is an attempt to capture and/or codify the living, breathing reality of actual storytelling in day-today activities. The main issue is that conceptual and practical storytelling is divorced from any systematic foundation that would give it both a dimension of rigor and practicality.

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

Values of Digital Storytelling in Libraries

Digital storytelling is a blend of video, audio, images, and text to convey stories, information, and ideas. Most likely, libraries are not rendering digital storytelling activities because they are not yet convinced of the benefits of digital storytelling, here are some of the reasons why libraries should invest in digital storytelling activities.

Leadership Training

Libraries as major stakeholders in ensuring strong leaders of tomorrow should understands that journey to leadership starts from the infant and storytelling plays major role in ensuring that the gap between leadership and the historical antecedents of the people are bridged. People cultivate leadership qualities by being able to take charge: learning about themselves and their passions, directing their learning towards their interests, and developing initiative. People who take initiatives make decisions based on a willingness or desire to act, and use both creative and analytical thinking skills. Initiative demonstrates leadership skills, confidence in one's self and one's potential, and a willingness to do more or to start something.

Good leaders listen to their audience and consider its concerns and reactions. Digital storytelling is also very audience-driven because of the necessity to help the library's audience understand the library story through various media. By taking part in various digital storytelling activities, people can reflect on their own projects and on those of their peers.

Digital Storytelling Promotes Technology Competency

Digital fluency and literacy are vital for careers that will increasingly be machine-based. In the library, people will need to be competent with a wide variety of interfaces and computer skills to be successful. Libraries are expected to be encouraging the positive use of available technology. Expose people to the benefits of creating and uploading their own ideas. Give them a chance to interact with the digital world and make their own mark while still using the internet in a safe environment. By searching, critiquing, and producing for various media, people improve their research skills, evaluate the credibility and quality of sources, and learn about copyrights and the proper citing of sources. In addition to creating a story or message, digital storytelling gives people the ability and flexibility to work with different web tools and software programs. Word processors, image editors, music, and more all come together.

Promotes the Traditional Writing Process

Digital storytelling is still *writing*. Whether it is a multi-day project or a storyboard created within a time frame, the process for digital storytelling is the same as any other project. This include brainstorm; plan; create; revise; edit; publish; and reflect. People should be involved with every step, including the publishing stage if feasible. The bulk of the work remains in the planning stage. The implementation of planning and creating may cause people to rethink grandiose ideas in favour of more manageable and practical ones. Digital storytelling is also the perfect platform for project-based learning.

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

Critical Thinking and Decisions Making

When creating a digital story, people need to think about the project's purpose and craft with a goal. There are multiple aspects to any digital storytelling piece. While all pieces will not include images, video, audio, and text, incorporating all four enriches the story or presentation. Possible questions to motivate critical thinking and decision-making in digital storytelling include:

Why are we doing this or what is the message?

Who is the audience and what do I want them to feel?

What is that person thinking?

What mood should the story make?

What kind of words work best for the purpose?

I have a limited amount of time, where should I spend most of my time?

I need to make this shorter/longer, what can I add/take out?

Digital Storytelling Is Perfect for Sharing and Collaboration

One of the greatest strengths of digital storytelling is the ability to share it with others instantly. Sharing might consist of showcasing people creations, or sending a message out to the world. People can also work together on projects remotely or get feedback from their peers. Use social media as a means to distribute digital storytelling:

- Teach an Academic Concept
- Teach a Specific Skill
- Tell a Story
- Create Impact
  - Bring Awareness to an Issue or Cause
- Start (or Stop) Something
  - Challenge Popular Opinions
- Information Literacy Programme
  - Library orientation programme
  - Herded tour etc.

Digital Storytelling Is a Means to Creative Assessment

Big or small, digital storytelling projects can demonstrate people understanding and completion of goals. There are many times when libraries find assessment of its services difficult, so it is expected they use alternative assessments whenever possible! People will love creating a storyboard for the library, without even realizing the library is evaluating their progress.

- Talk Show with a Special Historical or Literary Guest
- Comic Strip or Storyboard with Voiceover

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

- Public Service Announcement Posters or Commercials
- Documentary of a Class Experiment
- Movie Trailer for a Book or Historical Event
- "Choose Your Own Adventure" Project
- Propaganda

Digital storytelling – in all its myriad forms – forges opportunities for both library users' initiative and imaginative. With digital storytelling, librarians and library users can create amazing projects with a greater range of creativity without being a stellar artist or wordsmith; they can tell stories or impart information in their own way and on their terms. All the library users need is a vehicle for self-expression, to show what they have learned, to see new-found knowledge and skills in a practical light, to take risks, and to take learning into their own hands.

Integrating Instructional Message With Learning Activities

Smeda, Dakich and Sharda (2014) reported that digital storytelling is a powerful tool to integrate instructional messages with learning activities to create more engaging and exciting learning environments. It is a meaningful approach for creating a constructivist learning environment based on novel principles of teaching and learning. Thus, this approach has the potential to enhance student engagement and provide better educational outcomes for learners.

Library Advocacy Through Digital Storytelling

Libraries often have to get creative when advocating for the value of library services and programmes. Digital storytelling is a great way to do so. Storytelling is the "currency" of a community. People tell stories to teach lessons, motivate, brighten someone's day, and so much more. But the heart of a good story is the people behind it.

Digital Storytelling Creation Guidelines for Library

Morra (2013) highlighted eight steps through which the library can create digital stories. The author presented a diagrammatical model of the guidelines and posited that in order to achieve digital storytelling creation in the library, a Digital Storytelling Process should be considered.

1. Start With an Idea

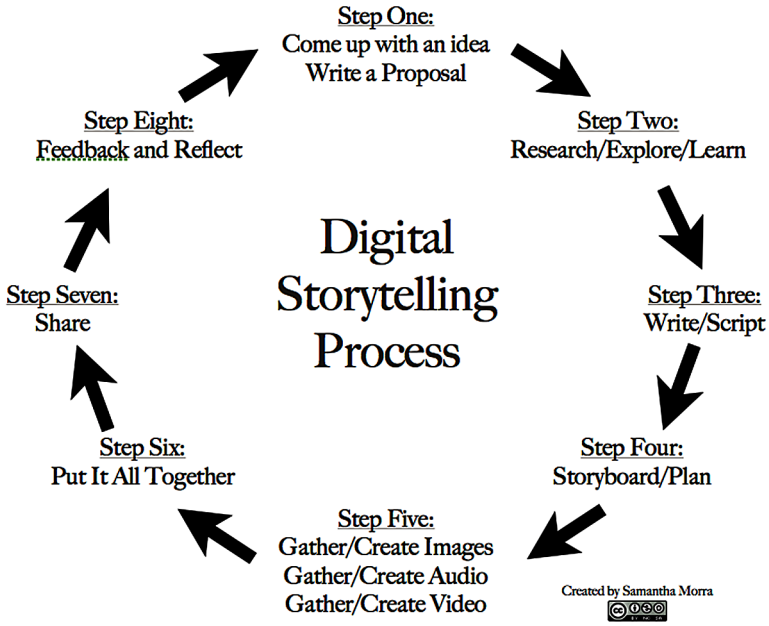
All stories begin with an idea, and digital stories are no different. This idea could be the topic of a lesson, a chapter heading in a textbook, or a question asked by library users. Digital stories might be fiction or non-fiction. Once the library or the library users have an idea, it should transform to concrete thought: the storyteller in the library should write a proposal, craft a paragraph, draw a mind-map, or use any other pre-writing tool. The concluding sentence had to explain why the topic is picked.

Resources that could be useful are

- Enchanted Learning-Paragraph Graphic Organizer

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

Figure 1. Storytelling creation guidelines



- ReadWriteThink-Webbing Tool

2. Research/Explore/Learn

Whether writing a fiction or nonfiction digital story, libraries need to research, explore or learn about the topic in order to create a base of information on which the story will be built. During this process, library storyteller or storytelling librarians learn both about validating information and information bias as they delve deeper into a topic.

At this stage, organization is very important. Mind-mapping could also be used to help library users keep track of information. Outlines, index cards, and online note-taking tools all work as well. If library users can organize their information digitally, then it makes the next steps much easier.

Resources that could be useful are**:**

- ReadWriteThink-NoteTaker
- EdTechTeacher – Mind Mapping
- Bubbl.us
- BibMe

3. Write/Script

Digital storytelling scripting requires specialised writing skills and equipments. When you are trying to write, there is nothing worse than a blank sheet of paper. Two pre-writing steps above are therefore encourages. If users have a proposal, with a little bit of editing, it can become the introduction. If users

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

research and explored a topic well, the body of the script should fall into place. The pieces are already there, users just need to make them fit.

This is also the time where literary decisions come into play. Ask users to determine whether they will use first, second or third person. Challenge them to expand word choices. Give them an opportunity to break out a dictionary or thesaurus. It depends all on the goals of the library and library users.

Resources that could be useful are:

- ReadWriteThink – Essay Map
- Visuwords
- Wordnik

4. Storyboard/Plan

Good stories start with a good script, but they do not end there. This is the reason transition into visual media literacies is encouraged. According to Robin (2018)

If people are not taught the language of sound and images, should not they be considered as illiterate as if they left college without being able to read or write?

Storyboarding is the first step towards understanding sound and images. It is the plan or blueprint that will guide decision making about images, video and sound. Simple storyboards will just have room for images/video and the script. More advanced ones might even include room for transitions, and background music.

Resources that could be useful are:

- ReadWriteThink-StoryMap
- StoryKeepers – Storyboarding

5. Gather and Create Images, Audio, and Video

In this process, the writing comes alive. Using their storyboard as a guide, libraries will gather – or create – images, audio and video. Everything chosen will impact and set the tone for the digital story. The library story teller will introduce concepts such as visual hierarchy, tone, and illustration. This is also a great time to talk about Copyright, Fair Use, and Creative Commons. The library storytellers should use this time to record themselves reading their scripts. Through this step in the process, they become acutely aware of mistakes and poor word choices.

Resources that could be useful are:

- EdTechTeacher – Citing the Web
- EdTechTeacher – Understanding Copyright & Fair Use
- EdTechTeacher – Public Domain Image
- EdTechTeacher – Understanding Creative Commons
- Wikimedia Commons
- Commonsense Media

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

- Fair Use
- Audacity
- Garageband

6. Put It All Together

This is where the magic happens – where librarians discover if their storyboard needs tweaking and if they have enough "content" to create their masterpiece. Librarians revisit and revise their storyboard. This is usually when librarians are so engrossed in their work that they don't leave when the bell rings, or they come back at lunch or after-school to work on the project. They will find ways to push the technology and tools beyond expectations – blending images, creating unique transitions between video clips, incorporating music or sound effects. Librarians could use this stage to provide users with a rubric so they understand what are necessary for a completed project as well as how to push themselves beyond the expectations.

Resources that could be useful are:

- Animoto
- Little Bird Tales
- iMovie
- YouTubeEditor

Rubrics:

- Digitales Scoring Guides
- Rubistar

7. Share

Sharing online has become deeply embedded in our culture, so as librarians. Review your library's Acceptable Use Policy (AUP) and then look for a way to share your stories with a broader audience. Knowing that other people might see the work often raises user motivation to make it the best possible work that they can do.

Resources that could be useful are:

- YouTube
- Vimeo

8. Reflection and Feedback

Too often in education, we do not teach or allow time for reflection and feedback. Library users need to be taught how to reflect on the work and give feedback to others that is both constructive and valuable. Blogs, wikis discussion boards, and users' response systems or polling tools can all be used to help students at this stage.

Resources

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

- Commonsense Media on Digital Citizenship: Blogs, comment threads,etc.
- Edmodo
- Google Form
- GoogleForm to Copy

PODCASTING IN LIBRARIES

According to American Library Association (2014), podcasts are free radio shows, for example, those on national radios. They include shows and stories not found on TV, online, or in print. Podcasts have unique and useful scholarly and leisurely material that is easy to access and librarians can be on the front lines of organizing and marketing them. Podcasts are available in most topics. There are shows about leisurely topics such as sports, storytelling, news, gardening, comedy, and yoga. There are shows about scholarly topics such as law, medicine, psychology, economics, and learning foreign languages. Podcast shows have celebrity guests that have interest in the library, and shows are also produced by known scholars. Podcasting can involve interviewing guests, talk about current events, and dig out library niche topic. Podcast files can be stored online for streaming, or they can be made available for download through a variety of programs. Podcasting is also seen as an online audio-based program akin to broadcast radio that delivers content to listeners. Libraries can—and many already do—use the podcast platform as an efficient and easy method to share news and information, promote programs and services, and distribute other important content to their patrons.

Dowling (2017) posited that as podcasts have further embedded themselves into popular culture, libraries have become active producers of podcast content, through both workshops for patrons and library-hosted programmes. At their base level, podcasts are an effective way of archiving library programmes and making them accessible to patrons who are unable to attend. Yet many libraries are pushing beyond merely recording author talks by producing shows that supplement existing programs, reflect the communities they serve, and engage patrons in a unique way.

Importance of Podcasting in Libraries

Libraries can benefit from podcasting in the rendering of following services:

- Public services
- Education and academia:
  - Podcasts for Students;
  - Podcasts for Teachers;
  - Consuming Podcasts;
- Podcasts in higher education for academic libraries;
- **Mobile Learning**: Podcasting can be categorized as an m-learning strategy for teaching and learning;
- **Mobile Knowledge Transfer**: Podcasting is also used by corporations to disseminate information faster and more easily;
- **Language Learning**: Podcasts can be used to both inside and outside the language learning classroom;

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

- **Mathematical Learning**: Audio-podcasts can also be used in mathematics education. With the recording of mathematical audio-podcasts, oral communication and representation are focussed on;
- **Academic Journal Digests**: The Society of Critical Care Medicine has a podcast used to update clinicians with summaries of important articles, as well as interviews;
- **Professional Development**: Professional development podcasts exist for educators. Some podcasts may be general in nature or may be slightly more specific and focus on the use of interactive white boards in the classroom;
- **Religion**: Godcasting has been used by many religious groups. Many churches produce podcasts of talks and sermons. *Disciples with Microphones* provides podcasts relating to the Catholic Church;
- **Tutorials**: A tutorial on almost any subject can be created as either an audio podcast or video vodcast. Through screencasting, many video podcasts demonstrate how to use software and operating systems;
- **Bibliotherapy**: Podcasts have been used to solve problems with college students' anxiety by allowing professors' lectures to be accessed after class so the students would not have to worry about missing any of the material if absent or tardy;
- **Entertainment**: Comedy, Television commentary, Radio series, as a platform for fan DVD-style commentary, Sports, Children's Literature, Fiction, News, Newspapers, Conference and meeting alerts, Marketing of library services, podcasting as a Business Content Marketing Strategy, Music, Politics, Health: Health and wellness education are widely accessible to the public through podcasts. Many developed countries such as Australia have utilised podcasts to publish new findings in the medical field.

Steps in Creating Podcast for Libraries

Roberts (2007) highlighted eighth steps to be considered when creating podcast for libraries. The steps are highlighted as follows:

1. Assemble the Required Equipment and Programming

Diverse designs will work, however the simplest is a PC with an amplifier and speakers and an application that records sound. The PC's receiver can be implicit, yet for better quality, utilise an outer mouthpiece with a USB connection. The sound-recording application can be a basic or advanced sound recorder or a podcasting programming application that permits altering and the expansion of music and audio cues.

2. Content Decision

Its quality will keep individuals returning for more portions. On the off chance that it's a piece of an arrangement, make a format and pick signature music to expand audience acknowledgment and to look after consistency. Make connecting with content with a suitable presentation, breaks, and an end. Likewise, think about extra highlights. Music or audio effects can flag a page turn, create intrigue, and keep audience members locked in. Utilise associated pictures, album art, layouts, or notes if the product permits it. You should likewise ensure you're compliant with the copyright. While consolidating music or pictures into an open digital podcast, you should ask for and get rights to utilize those melodies and

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

pictures. Or on the other hand you can utilize things that are in the general population space or that have just been authorized for non-commercial circulation. In case you're making the web recording for curricular use at the school and not for production, pursue reasonable use rules as sketched out in Digital Millennium Copyright Act.

3. Practice

For example, work on speaking until you're certain and the session streams easily in a characteristic, conversational style. Work on including music and sound components until you're comfortable with moves and changes.

4. Podcast Recording

Use programming that creates a MP3 sound record. Adhering to directions that accompanied the product, include and blend content, music, and sound components.

5. Podcast Testing

Hear it out and share it with companions. On the off chance that you do not care for what you hear, retry all or part of it until it's all the best you can offer. Students and staff are regularly inspired to exceed expectations that they understand an open posting of their podcasts implies that individuals from all around the globe could be tuning in.

6. Podcast Publication

Connect the podcast to a Web webpage with a RSS feed so individuals can buy in. Or on the other hand, interface the document for manual download. Submit the sound document for open posting on a podcast directory, for example, iTunes Music Store, Podcast.net, OurMedia.org, Podcast Alley, or PodcastPickle. Test the entrance to ensure it truly it works.

7. Podcast Promotion

Promote within your library's community and empower guardians, learners, and educators to key in. Students can be the best informal advertisers, however the quality and opportuneness of the podcast(s) will be what keeps supporters returning for additional.

8. Assess and Gain From Your Missteps

Be set up to modify your layout or make changes to systems for future podcasts. You need the final result to be as well as can be expected that you can make it.

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

INSTANT MESSAGING IN INFORMATION DISSEMINATION IN LIBRARIES

Mannan and Oorschot (2004) defined Instant Messaging (IM) as a communications service type over the Internet which makes it possible for people to send and receive text messages and track availability of a list of users in real-time. IM systems have been around since the UNIX applications talk and write. Over time, the usage of IM has transformed from the ordinary text messaging to the sharing of other information media such as audio-visual, pictures, audios, real online discussion etcetera. It has been predicted that instant messaging services on mobile phones will doubles its 21 billion messages per day in 2014 to 50 billion in the coming years (Notthoff & Carstensen, 2014). This is an indication that more library users will prefer to receive information via IM than the traditional methods of letter writing, notice board, handbills, and etcetera.

Adewoyin, Onuoha and Ikonne (2017) posited that instant messaging is gradually being accepted by libraries in the federal universities in Nigerian Southwest region though the usage was still adjudged generally low. Ansari and Tripathi (2017) however suggested that the uses of internet through mobile and smart phones are increasing rapidly with much emphasis on mobile instant messages (MIM). The author posited that libraries can use IM as a tool for providing an enhanced user services over library users' smartphones. Stephens (2006) positioned that libraries have a lot to gain using instant messaging such as marketing the library's products and services using platforms such as blogs, messenger, Whatsapp, IMO, and many more.

What Libraries Should Know Before Implementing Instant Messaging

Few things are expected to be mindful of before the implementation of instant messaging. Alexandrian Public Library (Mt. Vernon, Indiana) recommended the underlisted guidelines which could be a policy statement that libraries could emulate:

- Any screen names that send IMs containing obscene language or that are harassing will be blocked.
- We are unable to answer lengthy research questions via IM—for example, a complicated genealogical research question.
- We are also unable to provide advice on questions of a medical, tax, or legal nature.
- IM Reference is part of our regular reference service, which includes in-person and telephone reference services. Sometimes we might be answering all kinds of questions at the same time, so please be patient.

These and any other ones libraries can think of should be well thought-out before embarking on the usage of instant messaging. When libraries discover complexity in the answering of questions, users should be encouraged to visit the library in order for the library to have a better grasp of the query.

Implementing IM in Libraries

1. The library will need to determine a screen name and then register it at all instant messaging clients. Screen names are registered through the Web at the chat clients' respective sites. Just input some basic information and create a name in each one by following the step-by-step directions online. This step is free.

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

2. The library will need to train and encourage staff members to interface via IM from their desks. IM training can be similar to sessions created for virtual reference: highlighting how to insert URLs, predefining text messages ("please wait while I get that answer"), and emphasizing getting comfortable with the unexpected. Librarians are urged to dive in and "play out a reference scenario" as a method of getting comfortable.

Basic IM training competencies might include:

- Logging in to the application;
- The basics of chatting via a chat window with definitions;
- Inserting URLs and sending files; and
- Applying reference interview skills to the IM inter-action.

Your library will want to make IM part of your technology plan and include it in your policy manual. Make sure it is valued as a reference service. Two or three librarians staff the desk and answer questions in person, via the phone, and via IM. E-mail reference is done in the workroom on a dedicated computer.

Staff members should be comfortable with IM applications, and they should use it at their desks to improve workflow. Administrators should as well; this sets the tone that IM is important in the library, that IM is not just the domain of younger librarians.

A new service such as IM will thrive if staff is behind it, so have a plan to "Create Staff Buy-In." If they have been involved in planning, had training, and a chance to play and understand where IM falls in the information service provided by your particular library, staff members will understand the importance of logging in and performing good reference. Beyond IM, buy-in is very important for all technology projects in libraries.

Educate all staff members about the service, and make sure everyone on staff knows that the library is going to offer IM services. In addition, it will be important for your staff members to "learn the lingo"; if you are reaching out to teens, students or young adults, you may want to spend some time learning the vernacular of IM. Many Web sites offer glossaries of IM and chat lingo so you can decipher what BRB or GMTA mean! (BRB=Be Right Back and GMTA=Great Minds Think Alike)

Why Are We Doing This?

Why are we doing this? may be asked more than you think at your library as more and more projects centres around technology. If the question is there, you may be missing a perfect opportunity to get the best out of the IM or any technology.

Best Practices for IM in Libraries

Promote Your Screen Name and Service

It also needs to be publicized and promoted just like any library service or program. Sometimes I think we forget to promote our technology-related or Web-related initiatives because promotion seems to be inherent in the Web. Personally, I'd like to see a library put up a billboard or bus poster that says: "Have a Question? IM Your Librarian."

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

Add Your IM Name to Your Business Cards, Signature Files, and Web Portal

Promote your name every way you can. Add it to your Web presence, including your OPAC pages and contact information. Let staff members have their IM names on their business cards.

Create a Standardized, Consistent, Naming Convention for Your IM Screen Names

Take a look at the libraries offering this type of reference. Note the form of the name. At SJCPL, we registered *AskSJCPL* at all three clients.

Use Away Messages Effectively

Some libraries that IM set up an automatic away message: "The librarian will be right with you," or a similar sentence for incoming questions. Create a few choices and use them for times you might be working on another question, searching the stacks, or away from the desk.

Use Online Sources Only if the Best Answer Can Be Given From Them

Sometimes it is best to ask the IMing user to come to the library to pick up materials or do more work with the librarian in person. If the answer is only in a printed resource, offer to scan it and send it via e-mail, or hold the book for the user to come in to the library.

More Resources on Instant Messaging

AOL Instant Messenger (AIM): www.aim.com
AskSJCPL: www.libraryforlife.org/asksjcpl/asksjcpl.html
Edifice Ref's Trillian Training: http://edificeref.info/?p=71
Fire: http://fire.sourceforge.net
Fire Training: http://tametheweb.com/2005/05/more_im_training_materials.html
Gaim: http://gaim.sourceforge.net
IM SOS: http://tametheweb.com/2005/06/im_sos.html
IM Training at Tame the Web: http://tametheweb.com/2005/04/training_im_a_ready_to_go_modu.html
Library Success Wiki—Virtual Reference and IM: www.libsuccess.org/index.php?title=Online_Reference
MSN Messenger: http://messenger.msn.com
Sherri Vokey's IM at UNLV Post: http://blog.uwinnipeg.ca/schwagbag/archives/2005/06/iming_goes_live.html
Sherri Vokey's Training Modules: http://blog.uwinnipeg.ca/schwagbag/archives/2005/07/im_staff_traini.html
Trillian: www.ceruleanstudios.com
Yahoo! Messenger: http://messenger.yahoo.com

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

SUMMARY AND CONCLUSION

Libraries have transformed from being the traditional gatekeeper of information resources to content and access creators. Users look up to the library to take the lead in the education and information literacy efforts to achieve the information needed for national transformation. The chain of information (creation to dissemination) has transformed and emerging while existing technologies have influenced greatly the traditional library services. Some of the libraries services which are at risk of going into extinction are being revived through the adoption of information and communication technologies. Storytelling, oral communication and information dissemination within the library can be revived, revitalised and repackaged in order to meet the challenges of the ever-changing world. Digital storytelling, podcasting and instant messaging facilitate the libraries' traditional storytelling, oral information and communication, making it appealing to users and motivate the personnel handling them. Digitalisation has come to stay and libraries are encouraged to be in forefront of early adopters. This article discovered that libraries can benefit a lot using and deploying technologies in rendering services particularly the traditional ones such as storytelling, oral information and library communication. Espouse of digital storytelling, podcasting and instant messaging in libraries is canvassed in this chapter and it is expected that libraries will find the write up engaging.

REFERENCES

Adegbore, A. M. (2011). University faculty use of electronic resources: A review of recent literature. *PNLA Quarterly*, *75*(4), 1–7.

Adewoyin, O. O., Onuoha, U. D., & Ikonne, C. N. (2017). Social media use and service delivery by librarians in federal universities in south-west, Nigeria. *Library Philosophy and Practice (e-journal),* 1641. Retrieved from Https://Digitalcommons.Unl.Edu/Libphilprac/1641

American Library Association. (2014). *Podcasts: What are they and what role can librarians play?* Retrieved from http://www.ala.org/alcts/confevents/upcoming/webinar/101514

Ansari, M. S., & Tripathi, A. (2017). Use of whatsapp for effective delivery of Library and Information Services. *DESIDOC Journal of Library and Information Technology*, *37*(5), 360. doi:10.14429/djlit.37.11090

Ashikuzzaman, M. (2017). *Traditional methods of CAS and SDI*. Retrieved from http://www.lisbdnet.com/traditional-methods-cas-sdi/

Austin, T., & de Jong, W. (2008). *Rethinking documentary: New perspectives, new practices*. London: Open University Press.

Barrett, H. (2006). Researching and evaluating digital storytelling as a deep learning tool. *Society for Information Technology & Teacher Education International Conference, 2006*(1), 647-654.

Bauman, R. (2008). The Philology of the Vernacular. *Journal of Folklore Research*, *45*(1), 29–36. doi:10.2979/JFR.2008.45.1.29

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

Britannica Academic. (2017). Documentary Film, Britannica Academic. *Encyclopædia Britannica.* Available: http://academic.eb.com.ezproxy.arcada.fi:2048/levels/collegiate/article/documentaryfilm/30760

Bronner, S. J. (2006). Folk logic: Interpretation and explanation in folkloristics. *Western Folklore*, *65*, 401–434.

Case, D. O. (2007). *Looking for information: a survey of research on information seeking, needs and behavior* (2nd ed.). Boston, MA: Elsevier/Academic Press.

Dowling, B. (2017). Engaging patrons with library podcasts. *Public Libraries Magazine*. Retrieved 08/09/2018 from http://publiclibrariesonline.org/2017/10/engaging-patrons-with-library-podcasts/

Dushu, T. Y. (2016). Effects of weeding strategies on information resource management among public libraries in north-central states of Nigeria. *Library Philosophy and Practice (e-journal)*, 1433. Retrieved from http://digitalcommons.unl.edu/libphilprac/1433

Foster, J. (2009). Understanding interaction in information seeking and use as a discourse: A dialogic approach. *The Journal of Documentation*, *65*(1), 83–105. doi:10.1108/00220410910926130

Ginaka, T., & Bob, C. (2007). *Analyzing Library Collection Use with Excel*. American Library Association.

Hill, M. R. (1993). *Archival strategies and techniques*. Newbury Park, CA: Sage Publications. doi:10.4135/9781412983471

Isbell, R., Sobol, J., Lindauer, L., & Lowrance, A. (2004). The effects of storytelling and story reading on the oral language complexity and story comprehension of young children. *Early Childhood Education Journal*, *32*(3), 157–163. doi:10.1023/B:ECEJ.0000048967.94189.a3

Kridel, C. (2018). An introduction to documentary research. *American Education Research Association*. Retrieved 06/12/2018 from http://www.aera.net/SIG013/Research-Connections/Introduction-to-Documentary-Research

Kwanya, T. J. M. (2011). *The Potential of Library 2.0 for Research Libraries in Kenya* (Unpublished Ph.D Thesis). School of Sociology and Social Studies, Faculty of Humanities, Development and Social Sciences, University of KwaZulu-Natal, Pietermaritzburg

Lucarevschi, C. (2016). The role of storytelling in language learning: A literature review. *Working papers of linguistics circle of the university of Victoria, 26*, 24–44.

Mannan, M., & Oorschot, P. C. (2004). A protocol for secure public instant messaging. *Proceedings of the 10th international conference on Financial Cryptography and Data Security.*

McCulloch, G. (2004). *Documentary research in education, history and the social sciences*. London: RoutledgeFalmer. doi:10.4324/9780203464588

McKechnie, L. E. F., & Pettigrew, K. E. (2002). Surveying the use of theory in library and information science research: A disciplinary perspective. *Library Trends*, *50*(3), 406–417.

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

McKenzie, P. J. (2010). Informing relationships: small talk, informing and relationship building in midwife-woman interaction. *Information Research*, *15*(1). Retrieved 07 October, 2018 from http://informationr.net/ir/15-1/paper423.html

Morra, S. (2013). *8 Steps to great digital storytelling*. Retrieved from http://edtechteacher.org/8-steps-to-great-digital-storytelling-from-samantha-on-edudemic/

Nichols, B. (2001). *Introduction to documentary*. Bloomington, IN: Indiana University Press.

Notthoff, N., & Carstensen, L. L. (2014). Positive messaging promotes walking in older adults. *Psychology and Aging*, *29*(2), 329–341. doi:10.1037/a0036748 PMID:24956001

Ola, C. O., & Adegbore, A. M. 2015. Cultural heritage collections preservation and access: case of University of Ibadan. *The African Symposium: An online journal of the African Educational Research Network*, *15*(2), 50-55

Presentationzen.com. (2005). *Dana Atchley (1941-2000): A Digital Storytelling Pioneer*. Retrieved 07/12/2018 from https://www.presentationzen.com/presentationzen/2005/07/dana_atchley_19.html

Roberts, R. L. (2007). *Podcasting for information literacy*. Paper presented at the World Library and Information Congress: 73rd IFLA General Conference and Council Libraries for the Future: Progress, Development and Partnerships: Information Literacy Section together with the Academic and Research Libraries Section: Conduits for Transformation: Incorporating Multimodal Instruction and Learning into Information Literacy, Durban, South Africa. Retrieved from www.ifla.org/IV/ifla73/papers/133-LeeRoberts-en.pdf

Robin, B. R. (2008). Digital storytelling: A powerful technology tool for the 21st century classroom. *Theory into Practice*, *47*(3), 220–228. doi:10.1080/00405840802153916

Robin, B. R. (2018). The Power of Digital Storytelling to Support Teaching and Learning, *Digital. Education Review*, *30*, 17–29.

Salubi, O. G., Ondari-Okemwa, E., & Nekhwevha, F. (2018). Utilisation of library information resources among generation Z students: Facts and fiction. *Publications, 6*(2).

Scott, J. P. (Ed.). (2006). *Documentary research*. Thousand Oaks, CA: Sage Publications.

Smeda, N., Dakich, E., & Sharda, N. (2014) The effectiveness of digital storytelling in the classrooms: a comprehensive study. Smart Learning Environments, 6(1).

Stephens, M. (2006). Instant messaging. In *Web 2.0 and libraries: Best practices for social software.* Chicago: ALA. Retrieved 07/12/2018 from http://thehyperlinkedlibrary.org/libtechreport1/chapter-4 instantmessaging/

Tuominen, K., Talja, S., & Savolainen, R. (2002). Discourse, cognition and reality: Toward a social constructionist meta-theory for library and information science. In *Proceedings of the Fourth International Conference on Conceptions of Library and Information Science* (pp. 271-283). Greenwood Village, CO: Libraries Unlimited.

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

Tuominen, M. (2004). Channel collaboration and firm value proposition. *International Journal of Retail & Distribution Management*, *32*(4/5), 178–189. doi:10.1108/09590550410528953

Turner, D. (2009). *Conceptualizing oral documents* (Unpublished doctoral dissertation). University of Washington, Seattle, WA.

Wilson, C. (2018). *What is Digital Storytelling and How to Get Started*. Athabasca University E-LAB. Retrieved 07/09/2018 from http://elab.athabascau.ca/workshop/digital-storytelling

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

Chapter 10
Opportunities and Challenges of E-Book Readers and Mobile Devices in Libraries: Experiences From Nigeria

Victoria Okojie
University of Abuja, Nigeria

Faith Orim
University of Calabar, Nigeria

Oso Oluwatoyin
Ajayi Crowther University, Nigeria

Adeyinka Tella
University of Ilorin, Nigeria

ABSTRACT

There is a common saying that "books are the windows to the world." Despite the fact that in this digital age the leading role is taken by the internet, books still play their part as openings to the vast knowledge. It is no longer news that changes have been brought to the book world due to the development in modern technology. As we have printed contents, so also are digital version of books or e-books which can be read on any digital devices with e-book reader applications installed. This development enables people to have a library in their pockets. This chapter examines the experience of Nigeria and the utilization of mobile devices, libraries, e-book readers, and mobile devices for reading. This chapter will also discuss the future potential of mobile applications in libraries and opportunities associated with e-book readers and mobile devices. This chapter also identifies the challenges associated with the use of e-book readers and mobile devices and the way forward towards promoting the use of e-book readers and mobile devices for reading in Nigeria.

DOI: 10.4018/978-1-5225-9034-7.ch010

Copyright © 2020, IGI Global. Copying or distributing in print or electronic forms without written permission of IGI Global is prohibited.

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

INTRODUCTION

A book is a thing of knowledge and wonder; to be held, read, and understood. Reading is a way to gain knowledge, new ideas, and a new perspective. Imagine a room, filled ceiling to floor with all the books from all over the world (Perrine, 2010). It would take an inconceivable amount of space to store that much knowledge in a paper book form. Now imagine that entire library contained in an easily held device, with any book desired available at the touch of a button. Reading fanatics have been granted their greatest wish with the invention of electronic books, and the reading devices that contain them. The benefits of this new technology are numerous, but there are a few disadvantages as well.

It is estimated that 1 out of 4 people own a Smartphones (i.e. phones classified as having Internet access like iPhones, Windows Phones, and Android Phones); every year, more patrons are demanding libraries bring their services to the gadgets they love. Similarly, as Cummings, Merrils and Boreli (2010) indicated, varieties of studies have been conducted about handheld or small screen devices and their impact on library services. Several researchers have studied the use of library materials by handhelds. At the University of Alberta, Carney et al. (2004) found in response to their survey question, "Which of the following library materials would you like to be able to download to your PDA." that the two most popular responses were database search results 75 percent and 46 percent catalog search results. This implied that e-reader and mobile devices are currently changing the landscape of libraries especially academic libraries. The increasing prevalence of handheld mobile computing devices such as PDAs and web-enabled cell phones warrants are exerting lots of impact on libraries and the services.

The adoption of the digital devices such as smartphone and others prompted more and more libraries to "mobilize" library collections and services and to review how usable their library websites were on mobile devices. Consequent on this, libraries started introducing mobile-friendly databases to patrons; acquired and circulated handheld devices like the iPod and the iPad; incorporated mobile devices into library orientation, instruction, and reference activities; and added mobile-optimized websites and, in some cases, even native library apps. The libraries in Nigeria such as their counterpart in the developed nations have key in to tap the potentials and opportunities of digital devices. It is on this note that this chapter discusses the mobile devices and e-readers in libraries use of e-book readers and mobile devices for reading, future potentials of mobile application in the libraries, opportunities Associated with e-book reader and mobile devices, mobile devices and e-reader in the libraries: experiences from Nigeria, challenges associated with the use of e-book reader and mobile devices and the way forward towards promoting the use of e-book readers and mobile devices for reading in the Nigeria.

MOBILE DEVICES AND LIBRARIES

Mobile devices are portable, wireless computing device that is small enough to be used while held in the hand. The mobile devices are reshaping the information users' everyday lives in diverse ways, especially by delivering content in versatile forms. A mobile device or application (app) is computer software designed specifically for handheld mobile devices such as a smartphone or a tablet (Counte, 2018). Most apps allow users to access similar content, functions and services available on personal computers (PCs). Mobile apps must typically be bought and downloaded online, but there are many available at no-cost.

Mobile devices, such as smart phones, tablets, e-book readers, handheld gaming tools and portable music players are practically omnipresent in today's society. According to Walsh (2012), mobile data

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

traffic in 2011 was eight times the size of the global internet in 2000 and, according to forecasts; mobile devices will soon outnumber human beings. Studies have revealed that use of mobile devices is widespread and continues to increase. As of 2013, 56% of Americans owned a smart phone (Raine & Smith 2013). This number is even higher among people ages 18 to 29. However, Peters and Robert (2011) points out those mobile Phones at least can be found among people of all ages, nationalities and socioeconomic classes. This made (Peters, 2011) to emphasize that truly are in the midst of a global mobile revolution.

According to Negi (2014), mobile devices help to connect with patrons. Creating a library application ("app") or mobile Website that allows patrons to access library hours, view their library account or even search databases is easier than most people think. The resources should help libraries begin to plan and implement their own unique mobile presence: analyzing the present usage of mobile devices; providing an overview of devices, providers and features; describing the various activities these devices support for effective library use; focusing how libraries and librarians are responding with services tailored towards these devices; and what can be done by libraries in future in this respect".

Pazur (2014) observed that library users are definitely interested in accessing library services and resources through small screen devices and that some of them are even aware of new directions in searching of information. Libraries can deliver the following services via mobile devices: Mobile OPAC, Training via mobile, Library databases delivered via mobile, and providing notification in the form of SMS (Short Message Service) via mobile among others (Vollmer, 2010; Kumbhar; Sagar, & Pawar, 2014).

Bicen and Kocakoyun (2013) found that users especially students checked their mobile devices on an average times a day, but not very much for the educational purposes and for searching library catalogues or subscription databases. Students are using mobile technology for meeting their everyday needs as well as the academic needs. This has been possible because of the benefits that these devices offer; from clicking photos to uploading and sharing them, to searching library resources without time and place constraints (Bomhold, 2013). Portability is a great advantage of using a mobile device. Instant and quick access to a variety of resources via mobile is another benefit and availability of specially designed mobile applications (Mi et al. 2016; Chen, & Denoyelles, 2013). Mobile devices can also serve as a powerful data collection tools and also facilitate the capturing of user created content (Brown, & Metcalf 2015).

Telephones and e-mail are important tools to facilitate prompt handling and response to the stream of patron questions from within and out of the library user community. Most university libraries have one phone line, which is mostly used for administrative purposes and located in the library administrator's office. Mobile phones could be deployed at the enquiring desks." Short Message Services (SMS) or text facilities available on all mobile phones, could be used to create awareness amongst the library clientele about upcoming events and new arrivals. This could be flashed through a facility called "broadcast" where one text message is sent to all the library contacts listed in the address book on the mobile phone all at once.

Mobile applications for information seeker too have grown up tremendously with the growth of technology. Mobile Technology has now come up with "Libraries in Hand". The librarians are in the move to determine how these devices are affecting information access and ensure that they are communicating with patrons and providing web content in the most appropriate and effective ways. The current day Librarians must be prepared to take this challenge and put up efforts to increase the market and demand for mobile access to personalized facts and information anytime, anywhere on one's own handheld device.

Since Mobile handled devices truly are personal devices, search histories and physical locations can be harnessed to produce more accurate, indivisualised information and services. Users on the go don't want to wait for list of web results, they want answers to their question at once thus find mobile search

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

different from regular web search. More and more library users are using their cell phones or other mobile devices (e.g., PDAs, smartphones, etc.) for much more than talking and texting. Many patrons are searching and browsing the web, reading magazines and books, and generally doing things that recently used to do by computers. Technology has changed people's way of perspective and thoughts and producing its capabilities to the fullest even I am as a author to this article unable to cope up all the technicalities involved in mobile technology world because every second new technology is replacing other, yet I have tried my level best.

Libraries today are covering most of the technologies given by mobile industry like PDA's, Blackberry, iPod, Cellphones, UM PC's (Ultra Mobile PC) and mobilising library contents in a portable form suitable for small screen and delivering short services in the form of contents/ information with device's multiple searching features. As not all content is optimized for the mobile network, so the Transcoded Web is developing to transcribe content to fit into a mobile device. It's not perfect and some content is lost, but it's happening. There is mobil.licio.us, mobile blogger and a mobile My Space version. Librarians will need to become proficient in using these devices to enable users to access them anywhere from anyplace

Pocket Circ software that runs on a PDA that allows library staff to perform circulation tasks in any part of the library with wireless connectivity. I think that libraries will benefit from this type of flexibility with a handheld PDA device in a Windows CE environment sirsi pockcir combines the power of sirsi Unicom Library management system with the flexibility and ease of PDA to offer you all the benefits of wireless technology.. The addition of circulation information and book locations in the library take advantage of the mobility of the device and add another degree of self-sufficiency to the transaction. Libraries may want to consider providing access to circulation records, book due dates, overdue notices, and ILL requests via cell phones and handhelds to better serve their mobile patrons. Its definitely seems a boon to the staff as free them to serve user and perform both online and offline circulation operations without having to be on the desktop workstation.

Kosturski and Skornia (2011) identified the mobile devices now integrated with library services to include:

- **Mobile Phones:** When one thinks of mobile technologies, the first device that comes to mind has to be the cell phone or the smartphone. Beginners to the smartphone in the library may want to consider a mobile-based website, a stripped-down design that reads well on small screens. These sites do not require too much web design knowledge (remember that well-designed mobile sites do not have complicated code or scripting languages) and can be designed in-house. Librarians can also consider the smartphone app, either as a stand-alone app (University of Notre Dame's Hesburgh Libraries) or as part of a university app (Duke University). Companies such as Boopsie, the designer of the American Library Association's conference apps, stand ready to make an app that can do anything for your users—from searching the catalog to patron account information to basic library information. Many library resource providers, such as Westlaw, EBSCO, Science Direct, and RefWorks, have mobile apps or mobile sites that you can offer to your more wired students.
- **The Smartphone:** is not the only phone portal to mobile outreach. Librarians who notice more traditional cell phones on campus should consider text reference for their mobile outreach programs. With Google Voice, AIM Hack services (five- or six-digit numbers popular for mobile phone donations), and library-based options such as MyInfoQuest and Mosio's Text a Librarian,

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

you can set up a text reference service that can help you handle ready reference questions (or even more complicated questions) quickly and easily.

- **MP3 Players:** Mobile devices should not be limited to phones. Are you seeing library users with distinctive white wires extending from their ears? Chances are they are using an iPod or other MP3 player mobile devices you can use in your library for audio and/or video tours. With them, students can explore the library at their convenience, concentrating on the parts of the collection most relevant to their needs.
- **E-Readers:** Despite being available for decades, the general public has only become aware of e-readers in the last 5 years, primarily due to the popularity of Amazon's Kindle and Barnes & Noble's Nook. The latest generation takes content delivery to new levels, allowing for wireless browsing, purchasing, and delivery of content to these devices. There are still limitations, such as monochrome screens, difficulty with various file formats, and restrictive content licensing, but despite these drawbacks, users will bring e-readers to the library and will want to use them for their studies.

One area of digital content that academic libraries have already had a major presence in has been electronic reserves. This can be an easy place to start supporting e-readers on campus. Offering electronic reserves in a variety of formats improves the usability of the reserves system. The primary challenge that exists in this area is that unless the electronic reserve content is in a layout that can easily be converted to an e-reader format, it can be difficult to make it clearly readable. As conversion software improves and more content is born digitally, more libraries will support e-readers for reserves.

- **Tablets:** Tablets such as the iPad are still primarily a consumer item today and are outside the price range many feel is acceptable for a gadget. As more enter the market, prices will drop, and they will become more commonplace. Tablet PCs will be used to consume media as more of it is digitized and made available online for download and streaming. This means that activities such as searching databases, downloading articles, and perusing the catalog will likely be done through tablets, either through apps or tablet-formatted websites. The overall utility of tablets also makes them an ideal device for accessing a variety of documents, including e-books. Their ability to play audiovisual materials and their web connectivity could signal a new form of academic text that is both immersive and interactive. As many tablets currently on the market are based on revised versions of smartphone operating systems, they will have the same capabilities as smartphones and will run many of the same apps.

Tablets can also provide on-the-spot reference services. Pilot programs in various libraries have shown that the tablet provides convenience in accessing the library's resources while away from the reference desk and is a novelty that draws students' attention. The design of the recent generation of tablets lighter weights, slimmer profiles, and multi-touch interfaces that eliminate the need for peripherals—makes roving reference even easier. However, the lack of Flash web technology on many tablets does provide a barrier to accessing some websites, especially video sites.

- **Electronic Textbooks:** One of the next great digital frontiers being tackled is that of academic texts. Earlier attempts at electronic textbooks generally had mixed results, often due to lack of content in electronic format or discomfort with reading from a screen. Changes are on the horizon

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

that suggests that these issues may have been corrected. E-readers and tablets have new features that allow students to highlight and add annotations to the text, just as they would with paper texts. They give students the capability to link to additional information.

THE USE OF E-BOOK READERS AND MOBILE DEVICES FOR READING

Modern technology has brought changes to the book world. Aside from the words printed on dead tree, now we also have digital version of books or better known as e-books which can be read on any digital devices with e-book reader applications installed. Arising from the use of modern technology in the library brought the issue of e-book reader in the library.

E-Book Reader

An electronic book, or e-book, is basically a digital copy of a printed book. It is a "text- and image-based publication in digital form produced on, published by, and readable on computers or other digital devices" (Perrine, 2010). It can come in many formats, such as plain text files, hypertext markup language, and portable document format. A company that produces reading devices, as well as e-books, may also have their own formatting. A digital image of the text of a book is displayed on the screen of the reading device. A reading device can vary in size, specificity, and format. E-books can be read on desktop computers, laptops, e-reader devices, as well as some phones. Devices that are used solely for the purpose of reading e-books are called e-readers. The Kindle from Amazon and the Nook from Barnes and Noble are among the most popular e-readers. There is a wide array of e-readers available, and they all vary in their size and storage capacity. Screen sizes of e-readers can be from 5 inches to over 9 inches diagonally. The amount of memory available varies widely, and some devices offer additional storage space through the use of memory cards.

An e-reader, also called an e-book reader or e-book device, is a mobile electronic device that is designed primarily for the purpose of reading digital e-books and periodicals. An e-reader is similar in form factor to a tablet computer. E-readers are progressing rapidly with their book accessibility features, and display options. An e-reader is a device that can display an eBook. While many eBooks can be displayed on a computer screen, there is a new breed of portable device called an e-reader that is either fully or partially devoted to accessing and displaying e-books. Some of these devices are compact and lightweight, and can hold hundreds of digital books. According to NYU Libraries (2018), e-readers are devices that enable downloading, storing and reading e-books; however, a computer or variety of handheld mobile devices may also be used to download, store and read e-books. Features to keep in mind when selecting an e-reader include: screen functionality (LCD backlight versus e-ink?, touch screen?, color?) cost, 3G versus Wi-Fi, weight, and app support.

E-readers are single-purpose devices. Some of them offer extra features like web browsing, but you should be really careful about it. E-readers have technical limitations (like e-paper screen), and they are not meant to give anything more than a sheer pleasure of reading. Tablets are usually more expensive than e-readers, but they are also more versatile. You can use them for other purposes, such as emails, social media, web browsing, video, or games. They will also let you read e-books that are enhanced with images, videos, or interactive elements.

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

An e-reader, also called an e-book reader or e-book device, is a mobile electronic device that is designed primarily for the purpose of reading digital e-books and periodicals (CNET, 2017).Any device that can display text on a screen may act as an e-reader, but specialized e-reader devices may optimize portability, readability (especially in sunlight), and battery life for this purpose. Their main advantage over printed books is portability: an e-reader is capable of holding thousands of books while weighing less than one and the convenience provided due to add on features in these devices (Ray, 2011).

An e-reader is similar in form to a tablet computer. E-readers are a convenient way to read e-books since the battery can last for several weeks, compared to a laptop that usually needs daily battery charging; in addition an e-reader does not have apps that may distract its user from reading. The main advantages of electronic paper e-readers are better readability of their screens, especially in sunlight, and longer battery life. The Sony Librie, released in 2004 and the precursor to the Sony Reader, was the first e-reader to use electronic paper. The Ectacojet Book Color was the first color e-reader on the market, but its muted colors were criticized. Many e-readers can use the internet through Wi-Fi and the built-in software can provide a link to a digital Open Publication Distribution System (OPDS) library or an e-book retailer, allowing the user to buy, borrow, and receive digital e-books. An e-reader may also download e-books from a computer or read them from a memory card. However, the use of memory cards is decreasing as most of the 2010s era e-readers lack a card slot.

Some e-readers require connection to a personal computer to download books. The new versions of Nook and Kindle both offer a wireless feature that allows the user to browse and download books in seconds from almost anywhere. Companies that make e-readers are constantly competing to produce lighter weight readers, and easier to read screen images. The Kindle is only 8.5 ounces, which is much lighter than the average book. Some e-readers now offer additional features such as games, picture and music storage, and personalization. A read aloud function is also available on a few models. With the wide array of published e-books, and the availability of a variety of e-readers, anyone can carry a library of their favorite books with them wherever they go.

TYPES AND FORMS OF E-BOOK READER

Smartphones as E-Readers

Competition from multifunctional handheld devices has been cited as a reason for the failure of the first generation of e-book readers. Five years later, this competition has intensified even further, turning these devices into a major rival for the dedicated e-book reader. The argument that (almost) no one wants to carry an additional large device around with them when their multifunctional smartphone is perfectly sufficient for reading digital content as well now has even greater force. If we compare the scope of the iPhone with that of the current second-generation e-book readers, the iPhone actually performs better (cf. Mumenthaler, iPhone).

Other smartphones may feature similar technical possibilities for displaying e-books, but the iPhone offers an incomparably large range of e-books as well as numerous other applications for buying, managing and reading electronic books.The range of e-books for the iPhone is, all in all, more extensive than the ranges available for each of the individual dedicated e-book readers. Thanks to so-called “apps”, the iPhone can provide access to the complete selection of e-books from Amazon’s Kindle Store, any of the more than one million e-books on offer in the Barnes and Noble store, a hundred thousand freely avail-

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

able older books and numerous other platforms. In addition to this, there is the iBooks application, which was originally developed for the iPad but is now set to be released for the iPhone as well. Moreover, the iPhone offers publishers the opportunity to sell individual e-books as small independent applications.

Tablets as E-Readers

At the beginning of the year, there was some heated debate over whether 2010 would be the year of the e-book reader or the year of the tablet. The fact is that, in addition to the Apple iPad, a whole array of other tablets have been announced for release. Even before the arrival of the iPad, Microsoft introduced the Courier, which was due to come onto the market this year. HP, too, heralded the launch of a device called Slate, which is based on Windows 7 and was intended to rival the iPad. Other products that are reportedly in development include tablet computers from Google, Samsung or Nokia. In Germany, meanwhile, the WePad or WeTab has been causing a stir as an open, Android-based alternative to the proprietary systems from Apple.

Tablet computers are not a new invention, having been occupying a rather small niche in the notebook market for some years with varying degrees of success. Another promising newcomer to the market is the tablet netbook, a particularly small and therefore mobile notebook with a touchscreen interface, such as the Eee PC Touch from Asus. This is a super mobile portable computer with a touchscreen interface. Its advantage over dedicated e-book readers is in its multi-functionality as well as its ability to integrate seamlessly into the working environment. The latter is a particularly important argument in its favour for use in a university environment. Here, the advantage clearly lies with the netbook, even in comparison with the Apple concept pioneered by the iPad.

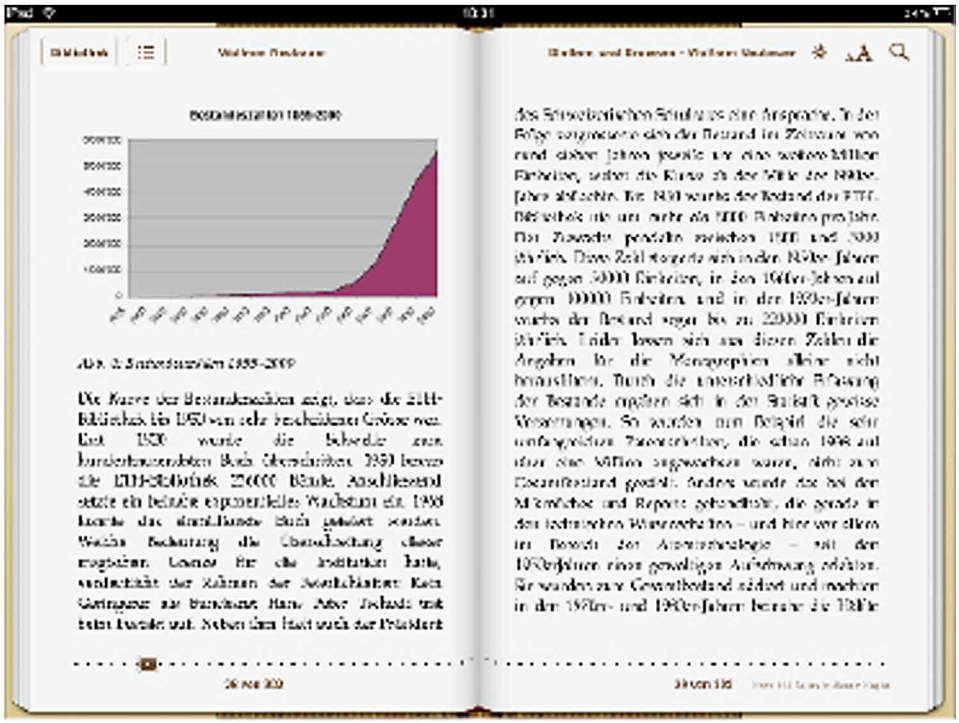
We have already compared smartphones and e-book readers with each other. With the iPad, another dimension comes into play and shifts the balance strongly in favour of the tablet. Its aforementioned disadvantages in comparison with the iPhone have now been almost completely resolved: the display is large and bright. Except in extreme lighting conditions, electronic books can be read on the iPad with no problems. In terms of the scope of the service it provides, Apple offers several tens of thousands of English-language titles for the iPad in its bookstore. Plus, the entire ranges from Amazon's Kindle Store and the Barnes & Noble store can also be accessed on the iPad via the relevant applications. Other publishers are expected to jump on the bandwagon, making an extremely wide range available to iPad users in the medium-term.

When it comes to displaying PDF documents, however, the iPad also offers practical advantages that are not to be underestimated. For one thing, the 9.7 inch screen affords sufficient space even for viewing documents in A4 format. For another, the iPad has excellent functions for enlarging documents and navigating. In practical tests, it proved to be very effective even for reading particularly cumbersome e-paper versions of daily newspapers. Thanks to the multi-touch interface, selected excerpts can be enlarged quickly and easily. It is expected that even more applications will be developed which exploit these functions. The GoodReader app, for example, which can be used to download and organise PDF documents and read them offline, is proving to be very useful. Exchanges with other users or with users' own PCs are already possible to a certain extent, though they are still far from easy, via platforms such as Dropbox or iWork.com from Apple.

Even though Apple's iPad still leaves a lot to be desired and lacks some important functions, it nonetheless opens up new possibilities. This concept has proved popular with customers, albeit in the form of neither a laptop nor a smartphone nor an e-reader. This platform is therefore becoming all the more

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

Figure 1. Screenshot: Own created e-book, using the iBook application on the iPad



interesting for developers of applications involving these new forms of use, as well as for those, such as publishers, who provide the content.

Burnaby Public Library (2018), emphasized that before considering an e-reader for oneself or someone else, and before making purchase, it might be helpful to know which e-readers are library e-book friendly, and which one are not. Some of the e-readers identified are:

Apple iPad

The iPad is full-featured tablet that can be used as an e-reader via apps such as iBooks, which support both ePub and PDF formats. With additional free software, the iPad can also display e-books designed for the Kindle, Nook, and other devices.*Formats supported:* EPUB, PDF, other formats via apps. iPad and iPad Mini The Overdrive Media Console app and 3M cloud Library app for Apple devices allows you to search for, download and read library e-books directly on the iPad, making it (along with the iPhone) library e-book friendly. The iPad doesn't feature e-ink, but it does have an exceptional, full-colour backlit display, and allows you to browse the web, check email, and play games and more.

Barnes and Noble Nook

The Barnes & Noble Nook is a dedicated e-reader, but also comes in a color and tablet version. Formats supported: EPUB, PDF, TXT, AAC, most Microsoft Office and standard image formats. The Nook is a Barnes & Noble product, and as far as we know, is only available for purchase in the United States.

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

It has been a popular option for cross-border shoppers, though tech support may be somewhat limited for Canadian customers. This e-reader is easy to use, features e-ink technology, and is available with or without an illuminated display. There are also 7-inch and 9-inch tablet editions available, all of which are library e-book friendly.

Amazon Kindle

The Kindle is available in several models ranging from a basic reader, to a touch screen, to a tablet with a reader app and a color display (Kindle Fire). Keep in mind that some models come with advertising

Formats Supported

AZW, TXT, PDF, Audible, MOBI, PRC, TPZ. The Kindle Fire and Kindle Fire HD are Kindle's tablet e-readers. They run on a forked version of the Android operating system and are library e-book friendly. Library e-books are downloaded directly to the device using the Over Drive Media Console app and 3M Cloud Library app. The Kindle Fire and Kindle Fire HD don't feature e-ink but both have a vivid full-colour display. They also include apps that allow you to browse the web, check email, play games and more. Kindle Touch. Kindle paper white and Kindle Keyboard 3G. The Kindle Touch, Kindle Paper white and Kindle Keyboard 3G are excellent e-readers, and have enjoyed exceptional popularity since their release. Unfortunately, Kindle's dedicated e-readers are NOT library e-book friendly. Amazon's dedicated e-readers, including the touch screen, illuminated and keyboard editions; all feature e-ink technology.

Sony Reader

Sony's e-readers have been discontinued, but most were library e-book friendly. Sony has announced that it will be closing its Reader Store in March of 2014 and moving its customers to the Kobo platform. If you've got a Sony Reader, you can continue to use it to access library e-books. Later models allow you to download directly to the device, without connecting to a computer.

Android Tablets

There are a variety of Android tablets and phones on the market, and as far as we know, all are library e-book friendly. The Over Drive Media Console app and 3M Cloud Library app for Android devices allows you to search for, download and read library e-books directly on your Android tablet or phone. Tablets don't feature e-ink, but do have full-colour backlit displays, and allow you to browse the web, check email, play games and more.

Blackberry PlayBook

With the release of OS 2.0, the Blackberry PlayBook is library e-book friendly (Overdrive only). Library e-books are downloaded directly to the PlayBook using the OverDrive Media Console app. The PlayBook includes many of the features of other tablets, including a colour display and the ability to run a variety of apps. 3M Cloud Library does not support Blackberry devices.

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

Kobo Touch Mini, Kobo Aura, and Kobo Glo

The Kobo is a lightweight, easy to use e-reader, available in Touch, Mini, Aura and Glo editions. All the four e-readers are library e-book friendly. These are lightweight e-readers featuring e-ink technology, which is easy on the eyes and allows you to read even in bright sunlight. The Glo and Aura feature a softly illuminated display that allows you to read at night, without a lamp.

Kobo Arc

The Kobo Arc is Kobo's newest tablet. It runs on the Android operating system and is library e-book friendly. Library e-books are downloaded directly to the tablet using the OverDrive Media Console app. The Kobo Arc doesn't feature e-ink but has a vivid seven-inch colour display. It also includes apps that allow you to browse the web, check email, watch movies, play games and more.

Features and Specifications to Consider:

- E-Ink vs. LCD o e-Ink looks like the page of a book and is not backlighted which makes it easier to read outside but requires a reading light to read in the dark. eInk text and images are displayed in black and white only. o LCD screens are like reading on a computer screen. They are backlighted which means you can read them in the dark but they are hard to read outside in sunlight. LCD screens can display full color.
- Buttons vs. Touch Screens o Buttons: some e-Readers use buttons only to navigate through its functions and through the texts of the eBooks you are reading. o Touch Screens: other e-Readers have a touch screen instead of buttons. With the touch screen you tap directly on the screen to select options and navigate. o Both: there are some e-Readers that have a combination of both buttons and a touch screen that allow you to navigate in more than one way.
- Size o e-Readers vary in size quite a bit. With a larger screen you can see more text at once however the device is larger and you may have more difficultly carrying it around.
- Weight. The weight of e-Readers also varies. While there are some cases available that allow you to prop up the e-Reader, often people hold the e-Reader while using it, so weight is an important consideration.
- Battery Life or Generally e-Readers with LCD screens have much shorter battery life than those with eInk. Tablet eReaders (Kindle Fire, Nook Tablet, or the iPad) do many other things besides display text which use up a lot of power.
- Wireless and 3G o some e-Readers have the capability to connect to the internet via Wi-Fi or 3G.
- File Format on Kindle Book: works with all Amazon Kindle devices. It will also work using the Kindle app on other devices like the iPad, iPhone and Android phones.
- Adobe EPUB eBook: a file format developed specifically for eBooks, it features adjustable fonts. The ePUB format works on the iPad, Nook, Sony, and Kobo readers, but not the Kindle.
- Adobe PDF: a common file format for digital documents, and can also be used for eBooks. PDF eBooks can be re-sized, but are much less customizable than ePUBeBooks. PDF format works on the iPad, Nook, Kindle, Sony, and Kobo readers, but not the Kindle.

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

FUTURE POTENTIALS OF MOBILE APPLICATION IN THE LIBRARIES

More and more changes are expected within four to five years in the field of mobile technology and its application to the libraries, the day is not far when we will use phone to read barcodes or RFIDs in the library and OPACs will develop GIS sensitivity and be able to communicate with users through their mobiles for holds, fines, late notices, alerts, etc.

It is expected there will be having large component of asynchronous voice messaging including threaded discussions using v-mail technologies that will help the staff in providing ready reference service leaving behind texting and SMS. Timed v-mail as well as mobile v-blogging can well enhance the usage mobiles in future. Mobile web 2.0 application for social networking for library community should be realised that enables discussions, blogs, wikis and other features beneficial for all library growth. Privacy and copyright should be matter of concern in future due to the availability of web contents 24*7 and possibilities of its damage and loss in the computer and also mobile searches by all the individuals without any authentication or identification, as it is going to be the fastest growing application in the next five years even today It is already a major feature of Apple iphones user. The librarian has to understand fully the capabilities and potentials of the mobile technology and its use in libraries in near future by providing the quality based services matching with the needs of the user.

Opportunities Associated With E-Book Reader and Mobile Devices

E-Reader devices are certainly hot right now, but for how long? Some tech-centric web sites are predicting that dedicated e-Readers (that is, those that primarily are designed to read books) will be a short-lived technology. Others point to the folly of making such predictions – noting that some technologies fit needs so well that they die hard – one example being the compact disc. Another factor in considering e-Readers is that no two are alike – no doubt as a strategy to win market share. It's also important to note that as well as the functions e-Readers provide to users, they also provide a very important function for vendors – essentially, providing a virtual storefront to sell content directly to end users.

- Self-publishing is not the best. There is need for standard.
- Reducing the cost to serve many users at a time. The accessibility of books will be easier maybe if we could acquire free eBooks.
- No idea we would be happy to work with such publishers provided they have reasonable pricing for African libraries where we have limited funding to promote eBook culture in the African countries and to focus on increasing the percentage of electronic publishing with the help of the sectors concerned with the book industry, especially with the emergence of many standards and open sources for e-book and perhaps the most important is EPUB (is a free and open e-book standard by the International Digital Publishing Forum).
- We need free websites that offer eBooks for free such as Nil Self publishing.

New classroom technology is connecting with students by speaking the language they are used to, while also teaching them proper digital citizenship. It speaks the language of the future of our society as a whole. This was why the Secretary of Education Arne Duncan and Federal Communications Commission chair in the US, Julius Genachowski said on Feb. 1, 2012 that schools and publishers should "switch to digital textbooks within five years to foster interactive education, save money on books, and ensure

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

classrooms in the use up-to-date content. To achieve that, "the US federal government, in collaboration with several tech organizations, released a 70-page guide for schools called the "Digital Textbook Playbook," a "roadmap for educators to accelerate the transition to digital textbooks."

Still in the US, the percentage of K-12 classrooms with Internet access has increased from 51% in 1998 to 98% in 2012 and 40% of elementary school teachers use computers during in-class instruction. E-books is a trend following suit with so many advantages. Meaning that to be part ongoing trend, schools need to have the wireless network infrastructure it needs to be a part.

The most obvious disadvantage to purchasing an electronic reading device, made solely for reading e-books, is simply cost. E-readers can cost around $200.00 in some cases, and not everyone can afford one. Other electronic devices, such as a laptop computer or the new iPad, can be used to read e-books and are multifunctional, but those items are still fairly expensive. Sticking to paper books can be more cost effective, even if it is less convenient. E-reading devices are easy to use and easy to transport. They take up much less space when traveling than a paper novel does; in addition, they can store multiple books without adding weight or bulk. An electronic reader can even save a person from a trip to the bookstore by offering wireless downloads and book browsing.

An e-reader is a very convenient piece of hardware to possess, but there are a few drawbacks to owning one as well. All electronic devices are subject to failures, and an e-reader could malfunction. A paper book can be read without worrying that the words on the page will disappear. A book does not need to be plugged into the wall to be read, but an e-reader needs to be charged repeatedly, which can be inconvenient when sitting on the beach. Not every reading device comes with a wireless feature, and downloading a book may have to wait until a more suitable time. E-readers are also easier to damage than a paper book. A short fall can crack the reader's screen, or cause other irreparable damage. A paper book can withstand a fall, and is less likely to become severely damaged or unreadable. In addition, electronic readers rarely accept all e-book formats. Purchasing an e-book that has the wrong formatting is an unfortunate incident since e-books are seldom returnable. The factors of cost, convenience, and hassle are important to consider when purchasing a dedicated electronic reader.

The technology for electronic books and readers is still developing and advancing. The devices are getting thinner and lighter, and several enhancements are being added to make e-readers more appealing to consumers. Display technology is being experimented with to enhance the reader's ability to see the display in any type of light. Electronic readers are also becoming more multifunctional with internet access, and game availability. More e-books are becoming available every day to download, and even textbooks are available in electronic format. E-books could play a major role in the future of higher education. The *2010 Horizon Report* states, "An obvious draw for students is the advantage of having a single handheld reading device that can easily accommodate the entirety of readings involved in one's study, as well as all the essential reference texts". Will e-readers become an essential tool for college students? It's possible that multifunctional tablets with e-reading capabilities might become an integral part of everyone's daily life in the future. The iPad is a great example of future possibilities. However, paper books will probably never be completely replaced. "Once they own an e-reader, only 15 percent of consumers say they stop purchasing print books altogether". (Newsweek) Paper books can be destroyed and lost over time. There is the possibility of electronic failure and data corruption with electronic books and readers, but there is a chance that this technology will withstand the test of time better than a book made of paper.

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

MOBILE DEVICES AND E-READER IN THE LIBRARIES: EXPERIENCES FROM NIGERIA

To better understand how technology can facilitate reading, UNESCO, in partnership with Nokia and Worldreader, developed a survey to learn about the habits, preferences and attitudes of mobile readers. Specifically, the survey was designed to discover who reads on mobile phones and why; if and how mobile reading changes reading habits and attitudes towards reading; what people read and want to read on their mobile phones; what the central barriers are to mobile reading; and what factors predict people's intentions to read and keep reading on mobile phones. The survey was completed by over 4,000 people in seven countries (Ethiopia, Ghana, India, Kenya, Nigeria, Pakistan and Zimbabwe) and supported by qualitative interviews with numerous respondents. The depth and breadth of data collection make this study the most comprehensive investigation of mobile reading in developing countries to date. The findings are significant. Among other conclusions, UNESCO has learned that people read more when they read on mobile devices, that they enjoy reading more, and that people commonly read books and stories to children from mobile devices. The study shows that mobile reading represents a promising, if still underutilized, pathway to text. It is not hyperbole to suggest that if every person on the planet understood that his or her mobile phone could be transformed – easily and cheaply – into a library brimming with books, access to text would cease to be such a daunting hurdle to literacy. An estimated 6.9 billion mobile subscriptions would provide a direct pipeline to digital books (GSMA, 2014). The current study – by breaking down who reads on mobile devices and for what reasons – is a roadmap for governments, organizations and individuals who wish to help people better leverage mobile technology for reading. Knowing, for instance, that younger people are more likely to read on a mobile device than older people is instructive, as it indicates that older people will likely require significantly more guidance as they discover how to turn a device they may already own into a gateway to text. The study also exposes governments to the idea that digital libraries and mobile reading initiatives may have more impact than traditional, paper-based interventions. In essence, the study shines light on a new strategy to bring text to the people who need it most

The various initiatives put up by education institutions in using the mobile devices to promote reading abound. Some of these are discussed in this section as follows:

Odu and Omini (2017) examined mobile phone apps and the utilization of library services in university of Calabar library, Nigeria. Four objectives and four hypotheses were formulated to guide the study. Survey research design was used. The population of the study constituted of all registered library users in the 2015/2016 academic session. The population was 4,265 registered users. A sample of 225 registered users was selected using purposive and accidental sampling techniques. Questionnaire was the instrument used for data collection. Pearson product moment correlation analysis was employed to test the hypotheses at .05 level of significance. The findings revealed that there was a significant relationship between Tweeter apps and the utilization of library services, (r=0.57*, P

Akinbode, Adekunmisi and Olasore (2016) investigated how academic librarians in Olabisi Onabanjo University (OOU) Library, Nigeria used smart phones to embrace academic library services and routines. Questionnaire method was employed to collect data for the study. The data were analysed using descriptive statistics and analysis of variance (ANOVA). The study revealed that the academic librarians of the university had and used smart phones for personal and official purposes, though the use for personal activities were more pronounced than for library services. The study further revealed that status of the academic librarians does not influenced smart phones use amongst other findings. Many recom-

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

mendations were proffered amongst which were adoption of mobile technology for library applications and services as well as adoption of smart phone use by academic librarians to offer and enhance library mobile services and routines.

Chukwuemeka and Madu (2017) focused on Mobile Information Services delivery by Librarians in University Libraries in Nigeria. The Nigerian populace has overwhelmingly embraced the use of mobile devices as an integral part of their everyday lives. As at 2015, Nigeria ranks 7th in the world list of mobile phone users and 1st in Africa. On the world list of internet users, Nigeria is also 7th with 86,436,611 internet users. Also, in a 2015 profiling of countries that love smartphones by e-marketers, Nigeria was ranked 17th in the world. The need for this study was prompted after observing that most categories of people in the University communities rely much on Mobile technologies such as smart phones, cell phones, iPods, MP3 players and tablets as some of the mobile devices used in academic libraries, to locate, retrieve, evaluate and use information and the need for librarians in the University Libraries in Nigeria to assist these Information users with the use of Mobile technologies to professionally meet their Information needs. This therefore raises a question of what could be done to assist these information users in these University communities. The Study reveals that electricity failure; too many mobile devices to learn; lack of knowledge; slow speed of the internet; inadequate funds, staff and training opportunities in using mobile devices for marketing library and information products and services have been identified as some of the constraints to mobile information services delivery. Because of the mentioned problems, necessary measures should be taken as recommended by the researcher in the concluding part of this research work.

Iwhiwhu, Ruteyan, Oghenero; and Eghwubare (2010) revealed that DELSU library does not use mobile phones for library services as a result of lack of telecommunication infrastructure, high costs, problems with the technology, and lack of staff training and awareness. Since a majority of library users own a mobile phone, incorporating it into library services will promote a good relationship between library users and staff and enhance library services, which will attract and retain users. The academic library's heightened reliance on ICT challenges librarians' status and role as knowledge workers (O'Dell, 2009). ICT provides students with a broad perspective. Maharana, Biswal and Sahu (2009) found that students will not be effective unless ICT tools and techniques are used in the educational process. Further, it is evident from this data that the students realize that ICT tools and techniques should become a part of their education. Just as GSM has revolutionized the daily lives of individuals, it can also enhance and improve library operations. With the availability of full Internet service in the Delta State University library, Abraka, GSM usage could be facilitated.

Fasae and Adegbilero-Iwari (2015) examined the use of mobile devices by science students with emphasis only on privately owned universities in Nigeria. A descriptive research design was used, as the study was a survey research. Eighty copies of structured questionnaire were distributed to collect data from science students in advanced levels of their undergraduate programmes in Afe Babalola University, Ado-Ekiti (ABUAD) and Joseph Ayo Babalola University (JABU) Ikeji-Arakeji, in their lecture halls and laboratories with the permission and assistance of their lecturers. The data were collected within a period of five weeks. The entire administered questionnaire were correctly filled and returned, yielding a 100 per cent return rate. The data were analysed using descriptive statistics which includes frequency and percentage presented in tables and charts. The study found that science students in the selected private universities mostly (83.7 per cent) use smartphones than other mobile devices. Also, the students own mobile devices for the purpose of using educational applications (77.50 per cent) and to chat with people (72.50 per cent). The students use the Internet on their devices very often. The Internet facilities

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

mostly used by the students are e-mails (71.25 per cent), social media (68.75 per cent) and search engines (60.50 per cent). The challenges mostly faced by the students using mobile devices for academic practices are poor Internet connectivity (81.25 per cent) and high cost of data subscription (53.75 per cent). Given the knowledge gained from this study, it is desired that universities across Nigeria would encourage the integration of the use of mobile devices into core educational programmes. Also, mobile data service providers need to reduce the cost of data subscription, especially on campuses for students. Moreover, owners of private universities should ensure the provision of good Internet connectivity for mobile devices campus-wide. Free and accessible Wi-Fi hot spots should be created for students.

Adekunmisi, Akinbode, Oyedipe (2017) investigated how para-professional librarians (Library Officers cadre and only Assistant Library Officers) in Olabisi Onabanjo University (O.O.U) Library, Nigeria used smart phone to embrace academic library services. A questionnaire and an interview schedule were used to collect data for the study. The data were analysed using descriptive statistics and Analysis of Variance (ANOVA). The study revealed that all the library paraprofessional staff had and used smart phones for personal, official and library services, but the use for library services and routines (across the items for library services) were on a lower side. The study further revealed that gender of para-professional librarians does not influence smart phone use amongst other findings. The study thus recommended provision of good telecommunication facilities, integration of full mobile library applications and services into academic library functions and services and training of library staff for effective deployment of phone use for library services amongst others.

Amuni, Adetoro and Sule (2014) ascertained the perspectives of library users in two selected academic universities on the provision of information services through mobile technology. Six research questions were drawn to bring out the views of the respondents with a self-designed questionnaire that was administered to collect primary data. The findings revealed high possession of internet capable mobile device which were used for information search through various means. It also showed that those academic libraries presently do not provide information services through mobile technology. However, library users have preferences for mobile device in information search and also want information services to be provided through mobile technology. The study further established certain factors that hinder the provision of information services through mobile technology. The researcher recommends that academic libraries should consider the provision of information services through mobile technology to remain indispensable in the academic environment.

From the above, it is evidence that a number of initiatives and attempts have been put forward by libraries in Nigeria in the use of e-reader and application of mobile devices. However, it clear that libraries in Nigeria are making progress as far as the use of e-reader and mobile devices are concern. The pace is still very much at the lower level as many libraries are still yet to embrace the use of these devices. Evidently one of the contributing factors to the slow pace of adoption is the exorbitant cost of data to drive the use of e-reader and mobile devices. The charges by the internet service providers to make data available to the users are worrisome.

The review reveals that, there are still a lot of issues in Nigeria unresolved that rotate around eBook access, availability for multiple access, formats, purchase, and restrictions. An interview captured from the literature reveals that respondents were of these opinion "Because subscriptions payment was timely, so was the agreement between us- friendly. Combining resources reduces costs for individual institutions. I would like to acquire all books such as eBooks and printed books we are looking from suppliers of eBooks. I do not expect the eBooks to be very expensive. I expect many alternative modes of payments that are friendly. There should not be any stringent measures attached, delivery of eBooks should prompt

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

on payment. I expect that when I have purchased an eBook title, I should own it without being under the limitations of credits. I also wish to have archival service for the eBooks. The terms of purchase are not always clear. When is simultaneous access allowed for example? If we subscribe to a particular item is it outright purchase or otherwise? Various methods of eBook access should be available and afforded. An example indicates that, CD-ROM that contains e-book for children is only allowed for use inside the library and cannot be used outside the library. In terms of monitoring, the literature reveals that **-** monitoring and evaluation of eBooks usage in libraries leaves a lot to be desired. Responses reveal that librarians ask patrons individually of their impression with eBooks usage. To others, statistics is provided from vendors of some databases and to others, monitoring is done by user authentication access. As per evaluation, this is normally by the number of titles, number of library users and how often titles are accessed. It was also observed by some libraries that usage statistics are very effective through library users' evaluation forms and interactions with users/patrons. While others indicated that, there is no monitoring in their library because the eBooks are still very few and the library depends mainly on free eBooks on the web which seem be under utilized as well.

CHALLENGES ASSOCIATED WITH THE USE OF E-BOOK READER AND MOBILE DEVICES

Drinkwater (2010) in particular illustrates a number of weaknesses of e-readers: lack of academic content; Fiddly, fragile, needs charging' DRM (Digital Rights Management); environmental e.g. inability to replace a battery. Drinkwater concludes that it may be that the devices sit better as a much specialised consumer device than as part of a core library service. Polanka (2010) who posts a blog on e-books has edited a book No Shelf Required: e-books in libraries which neatly summarises the use of e-books in libraries and contains some case studies of the use of e-readers in US academic libraries.

Challenges of Accessing eBooks in African Libraries

The responses to this question indicated that the major challenges of accessing eBooks in African libraries are mainly: the embargo periods on the availability of new release materials and the issues of payment per loan basis; other challenges included relicense titles after a certain period of loans for example 16 or 52 loans, un certainty of supply or withdrawal of publishers from supply of eBooks with no notice, eBook supply override exception and limitations rights provided to libraries such as copyright and fair use provisions and eBook management services by aggregators. There were other challenges that were unspecified.

Archival storage: There is no central organization or company archiving digital books. The storage devices – flash, CD, memory drive used for this purpose are either expensive or of less quality and so in no time the vital information may be lost. Also, the handling of the storage device maybe poor and so loss is recorded. Information and storage devices must be handled with care. Incompatible data formats A general issue is the large number of incompatible data formats in which content is delivered, possibly restricting the devices that may be used, or making data conversion necessary. Streaming services can have several drawbacks: requiring a constant Internet connection to use content; the restriction of some content to never be stored locally; the restriction of content from being transferred to physical media; and

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

the enabling of greater censorship at the discretion of owners of content, infrastructure, and consumer devices.

Purchase of e-materials Publishers sell e-books to libraries with limited license to the book in most cases. This means the library does not own the electronic text but that they can circulate it for either a certain period of time or a certain amount of check outs, or both... then it's gone. When the facility does make the decision to purchase the e-book license, the cost is three times what it would could for a personal consumer. Power Upsurge Without a constant power supply, it is always difficult to make the digital publishing happen. Nigeria has a population (155 million) three times that of South Africa (49 million) and in 2007 had about 9% of the generating capacity of South Africa (21.92 billion kWh vs 240.3 billion kWh). And South Africa does not have enough capacity and suffers from power cuts or load shedding.

Area of Internet Coverage and Speed The area of coverage of the internet facility is not wide except in the cities. Normally, the living conditions here are costly. Digital publishers located in the other parts of the city may not find the connection to internet easy. Even if found, it may be slow to connect. No slow browser can download e-publishing of 3Kb and above. The internet service providers have 3.5 - 4.0G and Edge modem. Any digital publisher working with the Edge cannot do serious internet browsing because it always slow to connect. Not all areas have the 3.5 - 4.0G, for digital publishing to thrive well, this or faster network service should be made available in all parts of the nation. Cost the Mac and PC computers as well as for Android, Blackberry, iPad, iPod, iPhone, Windows Phone and Palm OS are available in Nigeria. The problem is the exorbitant price. The digital publishers may afford the cost of purchase, but how about the readers who cannot afford the cost? With this factor coverage of information dissemination or e-books/journals by publishers to people is minimal.

Presently, the cost of internet facility is high. One may need to purchase air time when one needs to do serious work. To me there is no seriousness on the part of users who find oneself in this position. Most students cannot afford buying air time for browsing with this the possibility of obtaining e-books is reduced or remote. Costs of software are still to some existent high. The antivirus, apps, PDF creator, flip converter to mention a few are high. If these cannot be downloaded free on the net, then it is selected few that can have access to e-publications.

THE WAY FORWARD TOWARDS PROMOTING THE USE OF E-BOOK READERS AND MOBILE DEVICES FOR READING IN THE NIGERIA

The technology for electronic books and readers is still developing and advancing. The devices are getting thinner and lighter, and several enhancements are being added to make e-readers more appealing to consumers. Display technology is being experimented with to enhance the reader's ability to see the display in any type of light. Electronic readers are also becoming more multifunctional with internet access, and game availability. More e-books are becoming available every day to download, and even textbooks are available in electronic format. E-books could play a major role in the future of higher education. The 2010 Horizon Report states, "An obvious draw for students is the advantage of having a single handheld reading device that can easily accommodate the entirety of readings involved in one's study, as well as all the essential reference texts". Will e-readers become an essential tool for college students? It's possible that multifunctional tablets with e-reading capabilities might become an integral

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

part of everyone's daily life in the future. The iPad is a great example of future possibilities. However, paper books will probably never be completely replaced. "Once they own an e-reader, only 15 percent of consumers say they stop purchasing print books altogether". (Newsweek) Paper books can be destroyed and lost over time. There is the possibility of electronic failure and data corruption with electronic books and readers, but there is a chance that this technology will withstand the test of time better than a book made of paper.

WAY FORWARD FROM THE IFLA PERSPECTIVE

IFLA should continue to work with national associations and libraries in Africa to develop information literacy for public libraries in Africa to create a greater awareness of eBooks as an important element of library collections. IFLA should continue to work with national associations and libraries to lobby governments to: o Improve universal access to and use of computers and ICT infrastructure in public libraries to enable client access to eBooks and e-lending. ovouchsafe public libraries authorities to develop ICT infrastructure so that access to eBooks and e-lending is made easy

Through the IFLA section on Education and Training, encourage a focus on eBook skills, capabilities and knowledge (based around the IFLA e-lending principles) for librarians to support e-learning techniques among the users thus ensuring an educated crop of professionals with the confidence in eBooks and related services to the users.

As part of IFLA's lobbying with publishers to highlight the importance of access to affordable eBooks in Africa IFLA should continue to support national library associations and national libraries in their advocacy to national governments to develop legislative frameworks which support local production of, and access to affordable eBooks and e-lending for libraries across all sectors.

IFLA should continue to support national library associations to sensitize the public and the community at large about the relevance and importance of using eBooks IFLA should continue to support national library associations, sections and libraries in their understanding of and implementation of eBooks and e-lending principles in libraries in Africa with a particular emphasis on public libraries.

CONCLUSION

It can be concluded that the development and integration of e-book, e-book reader and mobile devices into library practices has enable the bringing of library into the users' pockets. It has also resulted to a number of opportunities and associated challenges although these vary from developed and developing environment experiences. In the light of these, the chapter has reported the experiences from Nigeria, mobile devices and libraries - identified the mobile devices now integrated with library services, the use of e-book readers and mobile devices for reading. The types and forms of e-book reader and their future potentials of mobile application in the libraries, opportunities associated with e-book reader and mobile devices; mobile devices and e-reader in the libraries: experiences from Nigeria; challenges associated with the use of e-book reader and mobile devices and the way forward towards promoting the use of e-book readers and mobile devices for reading in the Nigeria have all been highlighted.

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

RECOMMENDATIONS

Library management should explore the possibility of providing mobile phone library services while liaising with mobile phone operators with improved transmitting frequency to avoid network failure at reduced tariff. Telecommunication infrastructures should be put in place for efficient and effective communication between library users and staff, which will engender mobile phone library services. Library users and staff should be educated on the proper use of mobile phone for library services, to eliminate abuse. Each section of the library should have a GSM set for that purpose. Information desk (infoseek) should be provided in the library with a staff and Internet/intranet connectivity within the library.

REFERENCES

Adekunmisi, S. R., Akinbode, R. O., & Oyedipe, W. J. (2017). Use of Smart Phone among Para-Professional Librarians in Olabisi Onabanjo University Library, Nigeria. *New Media and Mass Communication*, *59*, 1–10.

Akinbode Rahmon, O., Adekunmisi Sowemimo, R., & Olasore Remilekun, E. (2016). Smart phone use among academic librarians in a state University library in Nigeria. *Global Advanced Research Journal of Educational Research and Review, 5*(3), 45-54.

Amuni, S. I., Adetoro, N., & Sule, O. E. (2014). Mobile technology and information services provision: Perception of library users in selected universities. *Global Educational Journal of Library and Information Science*, *2*(2), 37–50.

Bicena, H., & Kocakoyunb, S. (2013). The Evaluation Of The Most Used Mobile Devices Applications By Students. 2nd Cyprus International Conference on Educational Research, (CY-ICER 2013). *Procedia: Social and Behavioral Sciences*, *89*, 756–760. doi:10.1016/j.sbspro.2013.08.928

Bomhold, C. R. (2013). Educational use of smartphone technology: A survey of mobile phone application use by undergraduate university students. Program: Electronic Library&. *Information Systems*, *47*(4), 424.

Brown, J., & Metcalf, D. (2016). *Mobile learning update, Eliott Masie's Learning Consortium Perspectives, 2015*. Retrieved from http://209.151.89.205/usdla.org/public_html/cms/mini websites/old/Mobile Learning Update.pdf

Burnaby Public Library. (2018). *Choosing an e-book reader*. Retrieved from https://www.bpl.bc.ca/news/choosing-an-e-book-reader

Carney, S., Koufogiannakis, D., & Ryan, P. (2004). Library services for users of personal digital assistants: A needs assessment and program evaluation. *Portal (Baltimore, Md.)*, *4*(3), 393–406.

Chen, B., & Denoyelles, A. (2016). Exploring students' mobile learning practices in higher education. *EDUCASE Rev. Online*. Retrieved from http://mimbumobile.com/wp-content/uploads/2014/07/University Study-on-Mobile.pdf

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

Chukwuemeka, O. A., & Madu, U. W. (2017). Mobile Information Services Delivery by Librarians in University Libraries in Nigeria: Some Observations. *Automatic Control and Information Sciences*, *3*(1), 5–7.

CNET. (2017). *Best e-book reader of 2017*. Retrieved from https://www.pcmag.com/roundup/294182/the-best-ebook-readers

Colorado State University. (2011). *E-Books and e-readers in Public and Academic Libraries*. Retrieved from https://www.poudrelibraries.org/about/pdf/ereader-report-2011extended.pdf

Counte, S. L. (2018). *Bringing Library Services to Mobile Devices*. Retrieved from http://libraryjuiceacademy.com/077-mobile-devices.php

Cummings, J., Merril, A., & Boreli, S. (2010). The use of handheld mobile devices: Their impact and implications for library services. *Library Hi Tech*, *28*(1), 22–40. doi:10.1108/07378831011026670

Drinkwater, K. (2010). E-book readers: What are librarians to make of them? *Sconul Focus*, *49*, 4–9.

Griffey, J. (2010). Electronic Book Readers. Gadgets and Gizmos: Personal Electronics and the Library. *Library Technology Reports*, *46*(3), 21–30.

GSMA. (2014). *Digital inclusion*. Retrieved from: https://www.gsma.com/mobilefordevelopment/wp-content/uploads/2014/11/GSMA_Digital-Inclusion-Report_Web_Singles_2.pdf

Iwhiwhu, B. E., Ruteyan, J. O., & Eghwubare, A. (2010). Mobile Phones for Library Services: Prospects for Delta State University Library, Abraka. *Library Philosophy and Practice*, *346*. Retrieved from http://digitalcommons.unl.edu/libphilprac/346

J.K. & I. (2015). Mobile devices for academic practices by students of college of sciences in selected Nigerian private universities. *The Electronic Library*, *33*(4), 749-759.

Kosturski, K., & Skornia, F. (2011). Handheld libraries using mobile technologies inthe academic library. *Feature*, *31*(6), 19–26.

Kumar, L. S., Jamatia, B., Aggarwal, A.K., & Kannan, S. (2011). Mobile device intervention for student support services in distance education context–FRAME model perspective. *European J Open, Distance E-learning, 14*(2). Retrieved from http://www.eurodl.org/index.php?p=current&article=447

Maharana, B., Biswal, S., & Sahu, N. K. (2009). Use of Information and Communication Technology by Medical Students: A Survey of VSS Medical College, Burla, India. *Library Philosophy and Practice, 281*. Retrieved from http://digitalcommons.unl.edu/libphilprac/281

Mi, M., Wu, W., Qiu, M., Zhang, Y., & Wu L, Li, J. (2016). Use of mobile devices to access resources among health professions students: A systematic review. *Medical Reference Services Quarterly*, *35*(1), 64-82.

Negi, D. S. (2014). Using mobile technologies in libraries and information centers. *Library Hi Tech News*, *31*(5), 14–16. doi:10.1108/LHTN-05-2014-0034

NYU. (2018). *E-books for Science & Technology Students: E-readers*. Retrieved from https://guides.nyu.edu/c.php?g=276905&p=1846484

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

Ogom, J. O., & Omini, E. U. (2017). Mobile phone applications and the utilization of library services in the University of Calabar Library, Calabar, Nigeria. G*lobal*. *The Journal of Educational Research*, *16*, 111–119.

Pazur, I. (2014). Attitude of the rudjer boškovic institute's scientists to the small screen mobile devices library services: A user survey. *Library Hi Tech*, *32*(4), 628–644. doi:10.1108/LHT-03-2014-0025

Pegrum, M., Oakley, G., & Faulkner, R. (n.d.). Schools going mobile: A study of the adoption of mobile handheld technologies in western Australian independent schools. *Australasia Journal*. *Educational Technology*, *29*(1), 66–81.

Perrine, J. (2010). *E-Books & Reading Devices*. Retrieved from http://e-booksandreaders.blogspot.com/p/references.html

Peters, M. A., & Roberts, P. (2011). *The virtues of openness: Education science and scholarship in a digital age*. Boulder, CO: Paradigm Publishers.

Petri, K. (2012). Accessibility Issues in E-books and E-book Readers. In S. Polanka (Ed.), *No Shelf Required 2: Use and Management of Electronic Books*. Chicago: American Library Association.

Polanka, S. (2010). *No shelf required: e-books in libraries*. Chicago: American Library Association. Retrieved http://www.lib.ncsu.edu/techlending/ebooks.html

Rainie, L., & Smith, A. (2013). *Tablet and E-reader Ownership Update*. Available at: http://www.pewinternet.org/2013/10/18/tablet-and-e-reader-ownership-update/

Ray, C. R. C. (2011). The weight of memory. The New Year York Times, p. D2.

Report, H. (2010). *Two to Three Years: Electronic Books*. Retrieved from http://wp.nmc.org/horizon2010/chapters/electronic-books/

Kumbhar, S., & Pawar, R. (2014). Mobile based services: application and challenges. In *Proceed. Changing Trends Acad. Lib. Librarianship Digital Env.* Shivaji University.

The Ocean City Free Public Library. (2018). E-*READER 101: Info for E-readers*. Retrieved http://www.oceancitylibrary.org/E-Reader-101/

Vollmer, T. (2010). There's an app for that! Libraries and mobile technology: An introduction to public policy considerations. *ALA Office for Information Technology Policy*, 1-13. Retrieved from http://www.ala.org/offices/sites/ala.org.offices/files/ content/oitp/publications/policy briefs/mobiledevices.pdf

Walsh, G. (2016). Screen and Paper Reading Research – A Literature Review. *Australian Academic and Research Libraries*, *47*(3), 160–173. doi:10.1080/00048623.2016.1227661

Walters, W. H. (2013). E-books in academic libraries: Challenges for sharing and use. *Journal of Librarianship and Information Science*, *46*(2), 85–95. doi:10.1177/0961000612470279

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

KEY TERMS AND DEFINITIONS

E-Books: This refers to as an electronic version of a printed book which can be read on a computer or a specifically designed handheld device. An electronic book, also known as an e-book or eBook, is a book publication made available in digital form, consisting of text, images, or both, readable on the flat-panel display of computers or other electronic devices.

E-Readers: This refers to as a handheld device on which electronic versions of books, newspapers, magazines, etc. can be read. An e-reader, also called an e-book reader or e-book device, is a mobile electronic device that is designed primarily for the purpose of reading digital e-books and periodicals.

E-Reading: This refers to a process when you read your books in a digital format instead of the older style printed format. It is all about reading books and newspapers on a portable device such as an e-book reader, tablet or smartphone. The term generally does not refer to reading the material on a desktop computer.

Mobile Devices: These are referring to as portable computing devices such as a smartphone or tablet computer. A mobile device is a computing device small enough to hold and operate in the hand. Typically, any handheld computer device will have an LCD or OLED flat screen interface, providing a touchscreen interface with digital buttons and keyboard or physical buttons along with a physical keyboard.

Smartphones: These refer to mobile phones that perform many of the functions of a computer, typically having a touchscreen interface, Internet access, and an operating system capable of running downloaded apps. Smartphones are a class of mobile phones and of multi-purpose mobile computing devices. They are distinguished from feature phones by their stronger hardware capabilities and extensive mobile operating systems.

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

Chapter 11
Library Signage and Information Graphics:
A Communication Tool for Library Users

Edeama O. Onwuchekwa
National Open University of Nigeria, Nigeria

ABSTRACT

Libraries are gradually becoming spaces for discovery, innovation, and community empowerment by catering to the various needs of the public. To harness the unlimited resources in the library, library digital signage is the perfect tool to help transform old buildings and spaces into a place of collaboration and innovation. Since it's a content-centric solution at its core, digital signs can go beyond looping a series of pictures. It's an intelligent tool that can tailor-fit content relative to the audience, location, time of the day, and even process. This chapter will address the different roles of signages and buttress the fact that digital signage can play a major role in this communication process in addition to demonstrating a "green" environment for library patrons. Graphic information can be displayed to the public in meeting rooms, at the front desk, in vestibules or cafeterias/cafes. The messaging can range from programs being held at the library to public service announcements to emergency messaging and so much more. There is no limit to the information that a library signage can convey to its users.

INTRODUCTION

Recently, Informational graphics and signages are among the most basic, and at the same time most indispensable, forms of library instruction and communication. Like other media employed to educate the library user, they derive their importance and usefulness from the needs that users experience as they search for information. Signages and information graphics include and are not limited to signs that identify individual areas and rooms, as well as signs that identify the objects and applications found in these rooms.

DOI: 10.4018/978-1-5225-9034-7.ch011

Copyright © 2020, IGI Global. Copying or distributing in print or electronic forms without written permission of IGI Global is prohibited.

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

There are a variety of function to what information the signages can communicate the library users. For example, an informational signage need not only tell users about things that they are seeking information on but can also tell them things they may have never known about. Library digital signage is also the perfect tool to answer frequently asked questions (FAQs), how-to inquiries and even display upcoming events and highlight new library services. For optimal results, library kiosks should be placed in areas with high foot traffic, preferably placed near front desks, entrances and lobbies. Amongst other roles, library digital signage can provide people with the necessary information that they need and can even promote new things that the library wants to highlight.

Library signage is also there to help users to use the library, which could be anything from assisting a user in navigating the library collection, to explaining how to use a self-check loans machine. The role of the librarian is not only to connect people to information but communicate this information appropriately and accurately to them, to buttress this point, Schmidt and Etches (2014) posits that signages can be seen as tools to achieve this, and hence their design falls well within the scope of library work.

Getting Started With Library Signage as a Communication Tool

Every person who enters a library building in search of information must deal with the library's physical environment throughout the search process. The library environment is the medium through which the user moves and communicates, and it is also a source of informational cues that he/she uses in making a series of wayfinding choices like locating the library catalogue or for locating the bathroom.

Digital signage is a form of electronic display that shows information, advertising and other messages. Digital signs (such as LCD, LED or plasma displays) can be found in public and private environments and many building across campus. Signage is a powerful visual tool for communication and a crucial component of the library user experience. Signage can welcome, guide, instruct, and delight users, helping them navigate the complex information world of any library. The graphic signage system makes the sign information content system tangible, in that it embodies and conveys the library's program's informational content.

Sometimes aimlessly wandering through library aisles and browsing bookshelves can be considered a pleasurable experience when a user is possibly browsing through the collections in a library, but when one is new to a library, the maze of floors and the variety of resources can be daunting, making the library experience a very unpleasant and frustrating one. In our daily interactions and visits to places, especially to unknown places, we rely on signs and visual clues to help us find our way. According to Polger & Stempler (2014), regular visitors to a library need help to inform and guide them through the continual changes that a library undergoes. This assistance is often provided through signage, which must be regularly reviewed and updated.

Different authors have shared their perspective on what a library signage or information tool is. Schmidt (2010) considers the library signage as one of the many "touch points" in a library, and library signages as added by Hahn & Zitron, (2011) could be "any interaction the user has with library service. Effective signage contributes to a user-friendly environment and can "help users move throughout buildings more efficiently and accurately and may reduce questions at service points" Bosman & Rusinek (1997).

According to Serfass (2012), Library signage serves two broad purposes: "informing library users and trying to influence their behaviour". It is important to help users to feel comfortable and confident in using the library to achieve this. Librarians should be encouraged to undertake responsibilities around designing signage, brochures, informational handouts, web pages, and promotional and instructional

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

documents every day as part of their jobs. It is important to note that library websites are also relevant to other forms of library communication. Informational graphics and sign systems can play an important role in educating the library user. They are "on the job" any time the library is open, reaching even those users who have had no other instruction. They can perform several functions, from orienting users to the library's resources and services to presenting specific instructional information at the point of need. They can also affect the kind of interactions users have with the staff and the ways in which users perceive the library itself.

There are several categories or types of signages and information graphic that will be considered here. Each category is described and labelled based on the functions that they provide in the library.

Directional Signage

The directional signage serves more aa guide or map to the user who visits the library. Library users need to make correct wayfinding decisions as he/she moves along the route from starting point to destination. Directional signages should be placed at decision points, i.e., wherever significant numbers of users have to make wayfinding choices or change direction. The process of creating a directional signage in the library demands careful attention in libraries where resources are spread out or architecturally hidden, and where the user often has a series of tasks to perform. The system should provide accurate and well labelled directions to enable and easy access to information resources and as much as possibly make a visible attempt to communicate appropriately direction information to its users.

Instructional Signage

These are Signages that describes behaviours, rules, or multistage tasks to the user. It informs the user for example a student how to act in certain areas, what to expect, and where to go. The user, having arrived at a resource, needs to know what to expect from it and how to use it effectively. The aim here is to present basic information as clearly as possible, reinforcing what the user may have learned about search strategy through other forms of library instruction, and, where appropriate, reminding the user that the staff is available for further assistance. The following devices might be used for instructional purposes such as information displays at major tools--card catalogues, public-access computer terminals, and reference sources or groups of sources such as periodical indexes. Point-of-use presentations, in audio-visual or printed form, coordinated with the graphics in design, content, and placement. Also, displays designed to give an overall view of search strategy or library procedures.

Emergency Signage

This is often considered as an emergency or Safety Signage. A safety sign is a visual alerting device, which advises the observer of a potential hazard. It is very important that a lot are taken into the consideration of creating an Emergency signage. Some issue to consider are that the sign should be eye catching, and clearly convey the intended message. Safety signs may consist of a signal word, message panel, and/or a symbol." An important and effective emergency Signage should …

- Emphasize Action
- Use a Symbol

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

- Choose an Appropriate Heading
- Write in a Headline Style
- Describe Hazards and Consequences
- Provide Emergency Information

Regulatory Signage

These category of Signage aims to enforce rules and influence user behaviour and in a lot of cases, it is typically the most challenging type of sign to implement and communicate with users. The user needs to know what behaviour is forbidden, permitted, or required in an area or situation in the Library. As necessary as it is to put up regulatory signages in the library, with careful planning, a library can often reduce the number of regulatory signs while at the same time clarifying their messages. The use of symbols, colour, size, or placement to distinguish regulatory signs from other signs should be considered to convey these messages. Several regulatory messages are commonly required:

- Signs regarding smoking, food/beverages, noise, and security procedures.
- Signs showing fire exit routes, emergency procedures, meeting room capacities, or other information required by building codes.
- Copyright notices posted at copy machines.

Informational Signage

A user entering the library or moving from one area to another needs to identify and select relevant resources and establish their general locations within the building. The signage should respond to the user's need to progress from general to specific information. An example of an information signage could be at the main lobby directory listing library resources, areas, and services and relating them to a building map. Displays in specific areas, such as elevator, lobbies on stack floors, providing more detailed orientation to these areas. The user needs to know about temporary conditions or changes in the library that might affect his/her tasks, as well as library hours, special events, and similar information. The informational signage has been used by a lot of libraries for current awareness purposes. Changes and updates to library policies and information about the library are always placed here for the benefit of the Users.

Problematic Signages

With the abundance of information on signage and graphic information, it is necessary to note that there is more to the creation of a good design beyond the content. As with other media used in library instruction, the design of informational graphics involves two basic tasks. The first is to define the desired user behaviour or knowledge at a given step in the search process--and, in this case, at a given location within the library building. The second task is to select and develop the best possible means of encouraging that behaviour or communicating that knowledge.

In one of his articles, Schmidt (2015) emphasized the importance of starting with good design. Some of the recent observation with regards to signages are that all signage from an organization should use legible and appropriately sized fonts paired with a logo and consistent positive design. According to

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

Kasperek (2014) Signs are meant to be understood from a distance, so at least part of the sign's content needs to be readable from afar. The title or header of a sign should be visible at a distance so that people who see it know if they need to read further. Signages should emphasize what can be done instead of what can't be done. Schmidt states that a signage should not "be considered negative, mean, accusatory, or defeatist" but every update or change on a signage should reflect corrected versions of the errors in the previous signages.

Fawley (2012) stated that "outdated or inefficient signage, confusing wayfinding, and uncomfortable seating can make an in-person visit frustrating and unsatisfying" In evaluating a signage by an academic library, an example of two problematic signs were that they used inconsistent colours and fonts, contained too much information, and the content could not be scanned quickly or within a short time by the user. Secondly, the placement height of wayfinding signage was also found to be a problem. Many signs hanging from the ceiling, well above eye level can be ignored by library users or not noticed. There are several other problems that should be considered when evaluating a library signage or information graphic. To avoid some of the issues around problematic signages, authors have advised that librarians walk through their library, observe the signage and use a checklist with the following to refresh and revitalize their signage:

- Does the signage feature the library's logo or name?
- Do the signs maintain a consistent font set?
- Are font sizes readable from a distance?
- Do signs feature a consistent colour palette or design?
- Do signs use language consistent with library policy?
- Do signs use positive language?
- Do signs avoid using library jargon? (patron, periodical, circulation…)
- Do signs use images that reflect the diversity of the community?
- Do signs use all languages spoken and understood in the community?
- Are signs yellowing, in poor condition or being defaced?
- Are signs created with the same materials? (laminated, framed?)
- Are signs hung at an appropriate height? Appropriate location?
- What areas could benefit from signage? What areas do not need signage?

It is very necessary to note that with all stared above, all signs should be able to be seen immediately upon entry of building. Another guiding rule should be that there should be no obstructions between the signs and the users point of view. Stempler & Polger (2013) posited that the library signage represents more than directions or policies; it is informational, promotional, and sets the tone of the environment. To be effective, signage must be consistent, concise, and free of jargon and punitive language.

CONCLUSION

It is interesting to see how many libraries are adopting digital signs as a communication tool to disseminate information to their constituents/patrons. With more and more services being offered by libraries these days the need for up-to-the-minute communication becomes essential to maintain their relevance in our

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

ever more digital/online world. Signage encompasses all displayed text and images that users reference in a space for directions and clarity.

Library staff need to care about signage, wayfinding, space layout, and accessibility because all these factors directly and immediately impact the library users' experiences before they have even used our services. In conclusion, librarysignages are everywhere in libraries, and while a good signage will direct and inform users, an ineffective signage will misinform, frustrate, and overwhelm users, Warren & Epp (2014).

Current Trends and Recommendations

The current interest among librarians in informational graphics and sign systems is traceable to several trends both within and outside the library profession. Over the past two decades, librarians have become more and more concerned with user behaviour, with the communication interface between user and library, and consequently with various forms of library instruction. At the same time, designers have given increasing attention to the need for informational graphics in public buildings; both the professional practice of sign design and the technology available for sign construction have gained in sophistication.

There are many factors that affect how users experience a library. Some are related to customer service, some are related to how much a user already knows about libraries and how they tend to work, and others are related to amount and value of the signage or information graphic available to the library user. It is highly recommended that a widespread dissemination to librarians of information on how to produce or purchase signs that are both professional in appearance and low in cost.

Also, the library management and educators should promote the coverage of in-house and commercial sign production methods in library school audio-visual media courses as this will boost the education and training procedures for upcoming librarians. Finally, workshops and conferences bringing librarians and designers together to foster communication on signage problems and solutions should be encouraged and promoted.

REFERENCES

Barclay, D., & Scott, E. (2012). Directions to library wayfinding. *American Libraries*, *43*(3/4), 36.

Barclay, D. A., & Scott, E. D. (2012). Directions to library wayfinding. *American Libraries*, *43*(3/4), 36–38.

Bosman, E., & Rusinek, C. (1997). Creating the user-friendly library by evaluating patron perception of signage. *RSR. Reference Services Review*, *25*(1), 71–82. doi:10.1108/00907329710306599

Edward, L., & Bhuva, N. (2014). *Signage by Design: A Design-Thinking Approach to Library User Experience.* Academic Press. doi:10.3998/weave.12535642.0001.501

Fawley, N. (2012). Appearances do matter! *College & Research Libraries News*, *73*(7), 414–415. doi:10.5860/crln.73.7.8797

Hahn, J., & Zitron, L. (2011). How first-year students navigate the stacks: Implications for improving wayfinding. *Reference and User Services Quarterly*, *51*(1), 28–35. doi:10.5860/rusq.51n1.28

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

Kasperek, S. (2014, Spring). Sign Redesign: Applying Design Principles to Improve Signage in an Academic Library. *College and Research Division*, *2*(1), 48. doi:10.5195/palrap.2014.54

Polger, M. A., & Stempler, A. F. (2014). Out with the old, in with the new: Best practices for replacing library signage. *Public Services Quarterly*, *10*(2), 67–95. doi:10.1080/15228959.2014.904210

Schmidt, A. (2010). Touch points and testing. *Library Journal*, *135*(8), 20.

Schmidt, A. (2015). The user experience: Positive signs. *Library Journal*, *140*(14), 25.

Schmidt, A., & Etches, A. (2014). *Useful, usable, desirable: Applying user experience design to your library*. Chicago: American Library Association.

Serfass, M. (2012). The signs they are a-changing': Is it time to give your library's signage a makeover? *AALL Spectrum*, *16*(9), 5–6.

Wakimoto, D. K. (2015). Librarians and graphic design: Preparation, roles, and desired support. *Public Services Quarterly*, *11*(3), 171–182. doi:10.1080/15228959.2015.1054545

Warren & Epp. (2016). Case Study of Libraries: Library Space and Signage Kindness Audits: What Does Your User See? *Partnership: The Canadian Journal of Library and Information Practice and Research, 11*(1).

KEY TERMS AND DEFINITIONS

Communication Tool: Refers to three forms of electronic communication in distance education courses—e-mail, discussion groups, and chat rooms. They are apps that act as a virtual, online meeting room for team members. They help your team have conversations, exchange vital project data, update others with progress, share files, and create work collaboratively.

Information Graphics: Information graphics or infographics are visual representations of information, data or knowledge. These graphics are used where complex information needs to be explained quickly and clearly, such as in signs, maps, journalism, technical writing, and education. They are also used extensively as tools by computer scientists, mathematicians, and statisticians to ease the process of developing and communicating conceptual information. Infographics are graphic visual representations of information, data or knowledge intended to present information quickly and clearly. An infographic (information graphic) is a representation of information in a graphic format designed to make the data easily understandable at a glance.

Library Signage: Library signage and guiding are Suppliers of library guiding, signage, display lighting, sign technology, graphic panels and branded library materials to enhance the visitor experience. Signage is an important part of communication and is essential for promoting safety and accessibility for library patrons.

Library Users: The term encompasses various terms such as patrons, clients, information users, information seekers, consumers, readers, etc. These terms can be used interchangeably because they all apply to those seeking the services of a library. The 21st century has virtually turned everything virtual.

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

Chapter 12
New Tools, Gadgets, and Devices in Libraries

Kayode Wale Adewuyi
Faith Academy Ilorin, Nigeria

ABSTRACT

The internet explosions, proliferation of online resources, and the advent of free and open access resources in the last two decades provided the much-needed impetus for libraries to inject new energy into providing quality delivery of its services. More and more applications and databases are being provided to the libraries as mobile products. This chapter summarizes, to some extent and expatiate to a large extent, the various new tools, devices, and gadgets operational and adaptable to various aspects of librarianship. After an exploration of how these devices and tools work, and the different types, the author provided a comparison of current popular products, followed by a look at some of the new tools, gadgets and devices that we have available (to and around us). With the awareness that we are in the midst of an ongoing information revolution, the internet and personal computing have tremendous potential to transform library services. All tools, devices, and gadgets will be analyzed with an eye towards the future, cost-effectiveness, performance, and functionality.

INTRODUCTION

The proliferation of electronic information; the dwindling budget for acquisition of library stocks; the desire to access materials in remote locations, the quest for collaboration, partnerships and resource sharing; and the ever increasing cost of preserving analogue materials; and so on, are some of the forces that prompted digitization of archives, records and library services.

New tools, gadgets and devices in libraries are offshoots of this library's digitization process. By definition, digitization of information materials is the process of converting analogue information to a digital format. It is one of the newest methods of managing information in this "information age", whereby information technology has assisted in making information accessible to people even in their homes. Therefore, traditional library materials in form of books, papers, manuscripts, documents, etc. "converted" into electronic formats, images (such as photographs and maps) are converted into digital

DOI: 10.4018/978-1-5225-9034-7.ch012

Copyright © 2020, IGI Global. Copying or distributing in print or electronic forms without written permission of IGI Global is prohibited.

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

representation using some type of scanning device(or digitizer) so that they can be displayed and/or manipulated on a screen. (Pandey & Misra, 2014)

Today's hottest web and mobile technologies are offering libraries a new world of opportunities to engage patrons. Ultra-popular social media websites and apps combined with the availability of affordable cloud-based services and the evolution and adoption of mobile devices are enabling librarians to share and build communities, store and analyze large collections of data, create digital collections, and access information and services in ways never thought about before. Libraries have become technology leaders by integrating cutting-edge tools to enhance users' experience. It's not enough to redesign the library website. Best practices mean developing user personas and following usability strategies to produce user-informed designs. New digital collections are stored in the cloud and mobile applications are developed around them. Librarians are claiming their venues on location-based mobile networks, developing bleeding-edge augmented reality applications, and participating in semantic web efforts.

Furthermore, it is a known fact that libraries have witnessed significant changes in recent years. This change which is brought about by information and communication technologies has impacted the mode of providing information services. The traditional methods of information dissemination have given way to electronic means of communication while the developments and application of ICT in library operations have improved and facilitated the dissemination of information and access; it has equally provided new roles in information provision, dissemination and transfer libraries and librarians no longer play a passive role, rather they assume an active role. The librarian is no longer a custodian of books but the gate-way to a myriad of information sources. According to Haber (2011) posits that while providing books was a standalone function for libraries throughout the last few centuries, their offerings have evolved with the digital age to meet the changing needs of their varying categories of patrons.

Specifically, computer technology has created a revolution with new advances, new ideas and new users for machines that were once considered useful for handful of tasks and industries. Thus, with the scope and ubiquity of computer technology, libraries and librarians need to remember that effective and relevant library services are driven by user needs. These technological advances have altered the more traditional forms of information provided by libraries. With the advent of technology, libraries are no longer the way we imagine with books on row upon row in a building with a person sitting in front. The world of library and librarian has changed by digital technology.

Forward-thinking librarians are actively experimenting with and incorporating these new technologies into their digital strategies.

LITERATURE REVIEW

A literature review is a body of text that aims to review the critical point of current knowledge on a particular topic. It seeks to describe summarize, evaluate, clarify and integrate the context of primary reports. For any scientific investigation it is necessary to have information about similar studies carried out earlier. The researcher has also carried our prior art search for the present study. While searching the prior art, the researcher has consulted library and information science abstract (LISA) E-LIS (E-prints in library and information science) an online OA archive for library information science, DLISE (Digital library of information science and technology) and other relevant websites.

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

Sukula (2009) emphasized on information services in Charan Singh University, Meerut, India. Network functions as a critical information services that can cater to vast number of users. Electronic library and information systems are becoming an impressive structure and modern academic system.it discusses academic networked environment, going on strategies and options in Charan Singh University, Meerut, now Indian universities are making strategies of encouraging innovation and transformation in higher education by using networks and networked information.

Cervone (2010) discussed the issues and impact of emerging technologies and innovation to libraries. He describes overview of the concept and application of emerging technologies and innovation practices. Liberians need to be careful about how terminology such as emerging technology is used as emerging technology in one sector not new in others and to have credibility, librarians must understand how those differences may play out within their overall organizations. When libraries are situated in parent organizations that value experimentation and innovation, libraries must be willing to experiment and innovate with services and processes.

Chua, Alton (2010) explained web 2.0 represents an emerging suite of application that hold immense potential in enriching communication, enabling collaboration and fostering innovation. However, little work has been done hitherto to research web 2.0 applications in library websites.it addresses the following three research question: (a) to what extent are web 2.0 Applications prevalent in libraries? (b) In what ways have web 2.0 applications been used in libraries? And (c) does the presence of web 2.0 applications enhance the quality of library website?

GADGETS

Gadgets form an integral part of our lives. They are essentially small tools or rather machines or devices intended to perform a specific function. However, gadgets are as well often considered as a novelty. The gadgets as well, often referred to as “gismos”. These two words are often used in defining the swagger of individuals who are tech-savvy.

God has given us everything like plants, trees, flowers, beautiful creatures and of course a very intelligent brain, through which man can do anything.as we all know, India has developed itself in technology and has invented many new electronic gadgets and devices, which have both advantages and disadvantages. Man, being so intelligent, has invented airplanes and spacecraft to fly in, trains, cars, ships, boats, mobiles, telephones and the internet for communication and many other gadgets useful in every aspect of life. These inventions have made it possible for us to do many things undreamt of at the beginning of the last century. The world has become so advanced that we have computers and laptops in almost every household today. Internet facilities are also great inventions. Mobile phones help us to talk to anyone, anywhere at any time. Man has come a long way from the invention of the wheel. There are serious disadvantages of such a fast pace of progress, like global warming and pollution but scientists are working on that too. All electronic gadgets have improved our lives a lot. So, in the coming centuries we can imagine how our lives can be. There are hundreds of inventions which have revolutionized human life. Electronic gadgets are prominent among these inventions. They play a vital role in our lives. The electronic gadgets we use daily consists of light, televisions, computers, fans, A/C’s, refrigerators, telephones etc. life would have been very difficult without these inventions. This shows that gadgets are one of the craziest things people would buy and must have.

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

GADGETS FOR OUR DAILY COMMUNICATION

Communication gadgets are a category of gadgets which control most of our lives but they are not the only gadgets that can increase the efficiency. Just think of the morning when you start using gadgets. Today we are not controlling gadgets instead the gadgets are controlling our lives. It has influenced our lives to such an extent that we cannot think a day without them. Starting from the early morning till the time we reach the bed, we are making use of some other gadgets in various ways.

Gadgets not only increase the flexibility and efficiency in our daily lives but they also help us to increase our life expectancy. With the advancement in technology new sophisticated machines are coming up that enable in surgical and diagnostic functions thus, preventing people from frequent deaths. In earlier times, due to lack of medical development, people died before their time, but recently, medical science has developed that people can now get medicines for almost every disease and illness. Even for minor things like measuring blood pressure and sugar level and so on, there are various kinds of tools gadgets and machines. Today, you can get everything at the tip of your finger. Furthermore, gadgets have also helped to bring joy and entertainment to our lives. It brings joy to the family and now no one has to stay apart from each other and feel the pain of separation. With the advent of gadgets like computers, mobile phones, cameras you can now connect with everyone whenever you want and also at the most reasonable prices.

BENEFITS OF GADGETS

Gadgets have made our lives pleasurable like the use of A/C during the summer season followed by a room heater during the cold and chilly winter seasons. Fans, driers, washers, sewing machines, air purifier are all gadgets. Wherever you look you will be able to see a gadget. Gadgets are also beneficial for disabled people for instance electronic eyes for the blind, it can help them to detect zebra crossing and thus ensure safety to cross the road. Similarly there are many other gadgets like braille, PDA's, electronic arm etc.

Gadgets can also help in saving a lot of space. Earlier, while using a telephone, you need to sit at a single place to talk with the other person but now you can travel anywhere with your smart phone and talk sitting wherever you want. Nowadays, developed android apps have come to bring a revolution in the world of gadgets. Again the facility of internet, camera eliminates the need of purchasing a desktop or a camera separately. Gadgets are also meant for fun, for example iPad, mp3, video system, DVD and not the least our favorite "idiot box"-TV. All these are possible only because of the advent in technology. These gadgets can bring the family together and a smile on the face. These gadgets can become very essential in life and they also help to remove boredom and loneliness in our daily lives.

Gadgets make our lives comfortable and also save our time and money. Just think when you can get everything stuffed in a single item, then what is the need to spend separately? If you can get internet, E-mails, songs, video, camera and every feature like that of a computer into a mobile phone then why would you go for purchasing a note book, video recorder, music system separately?

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

MOBILE TECHNOLOGY

Mobile technology is a technology that allows transmission of data, voice and video via a computer or any other wireless enabled device without having to be connected to a fixed physical link. The main components of mobile technology are mobile software, mobile hardware and mobile network.

A cellular network or mobile network is a communications network where the last link is wireless. The network is distributed over land areas called cells, each served by at least one fixed-location transceiver, known as a cell site or base station. This base station provides the cell with the network coverage which can be used for transmission of voice, data and others. In a cellular network, each cell uses a different set of frequencies from neighboring cells, to avoid interference and provide guaranteed bandwidth within each cell. When joined together, these cells provide radio coverage over a wide geographic area. This enables a large number of portable transceivers (e.g., mobile phones, pagers, etc.) to communicate with each other and fixed transceivers and telephones anywhere in the network, via base stations, even if some of the transceivers are moving through more than one cell during transmission.

With the rapid advancement in technology in the last two decades, mainly because of the advent of internet, the word no longer seems to work the same. The advent of wireless networks and more recently mobile devices such as smart cell phones, tablets etc. following the internet contributed a lot to make mobile technology come into existence. These hand held devices saw a lot of advancement in the last decade. The wireless networking and internet also witnessed a lot of reforms and discoveries which only made them better and more suitable to use for various mobile operations. As a result of which mobile has gone on miles since these discoveries and inventions and there has been no looking back since then.

Mobile devices, which were initially devised with an intention to replace telephones using wireless technology, have now become a very important part of daily communications, not only for telephone service users but also for the internet users. These mobile devices are very popularly used, especially among youths for the purpose of assessing contents on internet. The reason behind success of mobile technology is the benefits such as mobility and ubiquity served by mobile devices. The devices today have the capability to play rich multimedia content, allow for advanced user interactivity, run increasingly complex software and interact with cloud services. New hardware and technologies such as Bluetooth, accelerometers, multi-touch screens as well as text messaging, smart phone software applications, mobile websites, global positioning system (GPS), Wi-Fi and media creation and capture tools, are all part of the mobile environment.

It seems to me that libraries have been relatively slow to adapt their web-oriented services to the reality of the dominance of mobile access. Assessing the web via mobile devices continues to increase. While the actual proportions vary by the nature of the service, it is clear that the tipping points have been reached. It is no longer tenable to offer services that are not optimized for small devices. Mobile support should move into the realm of standard expectations and not as an additional add-on product. Now, in the same way that we expect any product or service to support the major web browsers, they should also follow principals of responsive web design and scale functionality to the size and the capabilities of the full spectrum of devices. Staff-oriented interfaces may need to be optimized for web browsers running on full-size screens to accommodate ergonomic issues and functional complexity. User-facing interfaces need to perform reasonably well when used from a smartphone and deliver more complex functionality for those accessing them via laptop, desktop, computer, or tablet.

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

Support for mobile is a critical issue that will receive overdue attention in years to come. Libraries have become increasingly aware of this issue and are rapidly upgrading their web presence to support mobile access. Those developing products for libraries that involve patron access will accelerate development of mobile-friendly interfaces. In the commercial realm, mobile support will be considered a point of competitive differentiation.

DIGITAL LIBRARIES

In the present day, there has been a misunderstanding around the term digital library; many people consider the World Wide Web as a digital library because of gathering thousands and thousands of documents in several formats and in several versions. Yet, a document may exist at one network the first day, and disappear the second. There are many different perspectives to defining digital libraries. For engineers and programmers, it is a different collection of algorithms, for most people, it is a large database providing direct access to all kind of information to the people from anywhere. For Computer Technicians, it is still a web application, whereas for Librarians, it is another step in Library and Information Science (LIS) field. But, technically speaking, a digital library *is a special library with a collection of digital objects that can include text, visual material, audio material, video material, stored as electronic media formats along with means for organizing, storing, and retrieving the files and media formats along with means for organizing, storing, and retrieving the files and media contained in the library collection.* Digital libraries provide a search interface which allows resources to be found. The backbone of any digital library is computer software, hardware, and the reliance of high speed networks. Any digital library rely on components such as local networks with connections to the internet, databases with user friendly interfaces for searching and administrative purposes which can index documents for fast access. A digital collection of documents are done by original authors, converting paper originals to digital format, dealing with right management issues such as copyright.

The digital library today uses different documents formats for storing and representing the content. A file format is a software algorithm for encoding the data and information about the data. Further they can be proprietary, developed by commercial companies or open file formats that are available for anyone. ASCII (American Standard Code for Information Interchange) and UNICODE are most widely used character set encoding. Page description format describe shapes and layout of a document. The most applied of these formats are Portable Document Format (PDF) and Joint Photographic Experts Groups(JPEG) are different formats that are used to store information of pixels in still images. For Audio and moving images the format are such as AIFF, MP3, AVI.

Digital libraries contain metadata, documents, audio, images, video in different formats, created with different software which makes information retrieval a complex task. Further usability is affected by the knowledge of search topic or domain and the knowledge of system used by the user. For digital libraries, user experience and good search strategy is vital to get good search result. Digital libraries can be maintained by individuals, organizations, or affiliated with established physical library buildings or institutions, or with academic institution where content may be stored locally, or accessed remotely via computer networks.

Locating information on the internet is inefficient relative to library resources, and does not provide high-quality services. Specifically, Lynch (1997) states: ”the internet was not designed to support the organized publication and retrieval of information as libraries are. It has evolved into what might be

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

thought of as a chaotic repository for the collective output of the world's digital "printing press."(p.52). thus according to Clifford Lynch, "the Net is not a digital library". (1997.p.52) digital libraries in another word are organizations that provide the resources, including the specialized staff, to select, structure, offer intellectual access to interpret, distribute, preserve the integrity of, and ensure the persistence over time of collection of digital works"(Schwartz, 2000,p.385).thus people can make use of the resources easily and economically (Schwartz,2000,p.385).

The term digital library was first used by the computers scientists referring to the electronic version of a library, and the truth is that the term, according to Slovney, (2004) "a collection of digital representations of numerous types of media, such as documents, images and sounds that are stored in an information repository and are available through a local computer or anywhere via the internet".

According to Hemlata & Meena (2013), Digital libraries have their basic characteristics compared to traditional libraries and are the following:

1. Digital library is a digital object, and can be merged with others.
2. Digital library provides faster access to information, because it provides advanced search and hyperlinks for navigation.
3. Digital library enables easy management of large amounts of data, because it provides access to a large and wide amount of information resources.
4. Digital library collections are a fixed permanent, in order to provide useful and understandable information to the users.
5. Digital library support formal and informal learning procedures, as it provides access to both basic and secondary educational sources.
6. Digital library can be accessed by any user from any workplace, since it provides a user-friendly system (pp. 20-21).

A general idea is that a digital library is cheaper than traditional one; but, creating a digital library means creating a complete organization of machines and people; and is an expensive project. Digitization tools are not cheap. Financial budgeting plays a plays a crucial role in development of digital libraries because no matter what library professionals want to do, or what are their user's needs, money is the source of all decisions (Kastellec, 2012). According to Fabunmi, Paris and Febunni (2006), as detailed below, budgets for digitization projects should include:

1. Salaries
2. Staff training
3. Digitization equipment
4. Legal fees
5. Overhead and indirect cost
6. Communication fees
7. Contingency

The initial cost depends on the material to be included in the digital library. The conversion of paper (printed material) into a digital form is surely expensive and time-consuming the type of material also affects the cost; the fragile material added to the cost because of its special needs and attention such as photographic and audiovisual collections which are prone to deterioration. Besides, the digitized mate-

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

rial should be implemented into a specific library application whereas the born-digital material should be stored in the digital library database. "Unlike the situation that applies to books, digital archiving requires relatively frequent investments to overcome rapid obsolescence introduced by galloping technological change" (Feeney, 1999). Apart from this, digital documents are bigger than traditional ones as a result; lot of storage space is needed. These networks servers and applications supported needs to be continually upgraded so as not to become unusable. If the services are to be provided outside of the library, like electronic databases, then there are additional costs for legal fees. Due to financial crisis, many Greek academic libraries cannot subscribe to the required journals and databases. Apart from the above expenses, there are also costs for library staff and users' training. Today, a common assumption is that information is free; actually, it never really was. There is always a cost for its creation, its maintenance, and its dissemination. Libraries have already been tested this irony with legal licenses in digital data usage.

SOCIAL MEDIA IN THE LIBRARY

Social media have entered library as early as Tim Berners-Lee introduces WWW in early 1990s. A social networking service is any website or application that focuses on connecting its users. These connections are often based on shared interests, activities, or real-life relationships. Users are typically single individuals, though businesses, organizations and public figures are often represented on social networks, where the first web generation Web 1.0 offers website as one of its applications.

Today, social media are in the interest of every library across the globe. For instance, National Library of Australia in the Social Media Strategy 2013-2014 acknowledges the roles of social media in achieving the library effectiveness and efficiency. They also acknowledge its vital roles in achieving the library, overall strategic goals.

MOBILE DEVICES

The number of searches using mobile devices is steadily increasing, and trend shows no signs of slowing down. Users enjoy the ease of searching via a wide range of smartphones, different types of tablets, or even laptop. A mobile of handheld device is an electronic device that enables some kind of computing, and which is small enough to be easily carried around. Mobile devices are used for a whole range of digital services that we rely on every day. Use of desktop computer is still relevant but the use of mobile devices for digital services has skyrocketed in past several years. In US, between Decembers 2010 and 2014, usage of smartphone has increased by 394 percent and tablet usage is up by 1721 percent which account for 60 percent of digital media time spent. Smartphones are used widely among the mobile devices. Smart phones a mobile phone with an advanced mobile operating system, which combines features of a personal computer operating system with other features useful for mobile of handheld use. The essential features in modern day mobile systems are a touchscreen, cellular, Bluetooth, Wi-Fi, GPS mobile navigation, camera, video camera, speech recognition, voice recorder, music player, near field communication and infrared blaster.

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

Mobile devices with mobile communications capabilities (e.g. smartphones) contain two mobile operating systems- the main user-facing software platform is supplemented by a second low-level proprietary real-time operating system which operates the radio and other hardware. Many types of operating systems are available for smartphones. However, Android dominated the market with 82.8% of market share. Android developed by Google is an operating system based on Linux kernel. Apple's iOS was at second position with 13.9% of market share. Windows and Blackberry are among the few other operating systems that are used.

MOBILE/DIGITAL SERVICES FOR LIBRARIES

Mobile libraries are libraries that deliver information and learning materials on mobile devices such as cell phones, PDAs, palm top computers and smart phones to allow access by anyone from anywhere and at any time. Users now can use any service provided by the library even while in commuting as opposed to the conventional libraries whereby learners are confined to physical structure or building. This results in learners having control of when they want to learn and use library's resources. Thus these mobile services can be simple as sending a text message alert about reservations of available books or as complex as accessing a eBooks and journal articles through their library subscriptions on any mobile devices. The libraries can provide the following mobile services:

- News and events
- Mobile online publics access catalog
- Mobile library instruction
- Mobile library database
- Short message service notifications
- SMS reference
- A webcam to check congestion on library

Online Public Access Catalog (OPAC)

An OPAC is an online bibliography of a library collection that is available to the public.it is the online database of materials held by a library or group of libraries where users can search library catalog to locate books and other materials at the library

Quick Response (QR) Codes

QR-code is one of the factors in attracting users to use m-libraries. This printed two-dimensional bar code is readable by the cameras on most of mobile devices including smart phones. These mobile devices, then, will translate and display the information in the QR-Code. This information is normally a URL that mobile devices then use to pull up a library's webpage or portal. In short, in m-libraries environment and application, QR-Code acts as an authentication entry before one can enter the library portal via mobile devices. Users do not have to type-in their username and password anymore every time they want to visit the library portal via their mobile devices.

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

Besides as authentication entry, QR-Code is also being used in libraries on library catalogue. QR-Codes are attached to library catalogue records, thereby allowing students to capture bibliographic and location information on their mobiles. QR-Codes can also be applied during literacy lessons, where links to other media such as YouTube videos placed on handouts.

LIBRARIES AND LIBRARIANS IN TRANSITION

From a historical perspective, there have always been precedents and a constant need to reorganize our internal library operations. Some were due to budgetary situations, some due to the advent of cooperation and networking. Since the 1970s, the appearance of cooperative cataloguing, and organizations like OCLC, Research Library Group, etc. have precipitated changes have had very little impact on our users and the ways that they viewed the library. Some online databases already existed, but they were not intuitive and mostly available only within the physical library. The internet has changed this.

Many entrepreneurs understood the importance and saw the potential of the Internet. The race was on. Who would develop the best search engine to harvest the myriad of information available? Many companies were created, but only a few survived and are still in existence today.

The expansion of the Internet posed great challenges to existing businesses, including the publishing world. Soon it became evident that an Internet presence was a must. The libraries have seen the birth of print only, print and Electronic, and Electronic only subscriptions on offer from publishers. The pricing model previously worked out over many years was no longer valid.

Publishers are still seeking a new business model and pricing model.

The self-empowerment of the Internet was addictive. With only a computer and Internet connection, you had the world at your fingertips! Thousands of young people with web skills were suddenly in great demand, making fortunes by creating websites, running online businesses– eBay, etc. The internet bubble was upon us. New generations of entrepreneurs were hired by existing businesses to create web presences for many companies. It was all about discovery *and the* information. The information found on the Internet was free.

While this was happening, other technological advances, i.e. personal computers, fiber optics, etc., aided the rapid expansion and use of the Internet. Apple and Microsoft arrived on the scene. Of course, there were others that made a blip on the horizon and then vanished.

LIBRARIES AND LIBRARIANS IN THE DIGITAL ERA

Traditional libraries differ from the digital libraries in the way they provide services focusing on printed catalogs and books. Nowadays, librarians having conformed in the digital era are supposed to be able to use the newest technology, to organize and diffuse data in a digital form, provide digital reference services, to anticipate how technology concerning the library can be improved in the future and so on. Academic and research librarians are supposed to have various technological skills in order to provide services to their patrons.

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

Libraries nowadays provide both analogue and electronic services to users, and have deployed various digital skills. Many librarians have the knowledge and experience in "accessing searching, browsing, navigating, retrieving, indexing, storing, organizing and dissemination of digitized information," (Sreenvasulu, 2000, p.15). Moreover, librarians' role is not only to provide services to users but also to advise them how to use both the analogue and digital material effectively. Thus, librarian can consult library users on what digital library tools (i.e. OPAC cssatalog, databases) to use so as to access the right information. Academic libraries provide various e-services to users. The access to e-services does not require the physical presence in the library.

NEW TOOLS AND TECHNOLOGIES IN LIBRARIES

Nowadays, the traditional libraries have adapted to the digital era. Academic libraries have evolved and make use of modern technologies. Moreover, libraries have to replace the libraries' various traditional tools digital tools. This means that librarians need to adapt to the digital environment. According to my findings, the best way to adapt to the digital era of libraries is firstly the education and secondly to practice 'alone' as much as possible the usage of library's systems in order to get used to it. Practicing alone is very useful for librarians' adaptation but their education is a prerequisite in their smooth adjustment to the new systems of their job. According to my findings, libraries depend on technology and librarians won't be replaced in the future by technology.

In addition, librarians have addressed various problems and weaknesses with the usage of libraries' digital technologies such as the information systems and the digital libraries. But during my interactions and communication with colleagues (librarians), I understood the importance of cooperation among librarians, computer scientists, technical support, information system or the digital library creators to address weaknesses and propose them further improvements of the systems. Librarians play a very vital role in the improvement of a library's information system, or digital library. Librarians share to the system creators, important information concerning problems and weaknesses that they and the library users have addressed during their usage. According to the literature "Librarians need technologists' systems, computing network, and other technical expertise, while information technologists can learn much from the library's knowledge of users' needs." (Rapple; 1997, p 46).

Additionally, according to my research, most librarians were positive and open to new tools, gadgets (technologies). Only some of the librarians expressed feelings such as stress of fear to new technologies in their workplace environment. But the ones who expressed stress feelings with new technologies said that they feel stress only in the beginning of the integration of new technologies in their job. According to Ennis, "technostress" exists in workplace environments where employees address problems in adapting to the new technologies (2005, p.10). Many libraries focused on the importance and the necessity for their adjustment in the usage of digital technologies. Education is very important for their adjustment in the changing workplace environment. Librarians need education, and education is necessary for their adjustment to the new technologies. Being educated in their job makes the employees feel more confident as they gain knowledge on how to use digital material in their workplace environment. Librarians accepted that technology skills are part of the librarian's job. The more they educated the most knowledge they acquire, and they are able to respond to the various daily challenges in the job.

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

TECHNOLOGY TO ENHANCE THE PHYSICAL LIBRARY EXPERIENCE

Libraries have been using radio frequency identification (RFID) technologies for years, enabling increased staff efficiency in the circulation and management of physical collection items, functioning essentially as a high-tech-and more expensive-bar code. Since it is tied to the computational power of smartphones (including location services), NFC offers some interesting possibilities for more innovative applications in libraries. I see considerable potential for library-vendor-developed products and services that will enable more meaningful and productive interactions between library patrons and the content items and services in the physical library. A few years ago, QR codes were quite the topic of conversation as an example of new technology that would benefit libraries. These "quick response" images can be read by a mobile device to instantly present a specific webpage that might provide additional content of interest related to an item in the physical world. For example, scanning a QR code on a movie poster can launch a video of its trailer. However, I have not necessarily seen compelling use cases for QR codes in libraries. Bar codes have been a standard way of linking individual pieces of content to circulation and other services. QR codes may provide a few interesting use cases in a library setting, but they have not made a major impact. Shockingly, I have even seen considerable misuse of the technology, such as placing a QR code on a webpage.

Given the increasing pressure on libraries relative to budgets-and the increasing overlap or competition between services offered by libraries and the commercial sector- we need to take advantage of all the tools at our disposal. In addition to energy, creativity, and passion of the individuals who work in libraries, technology stands as an important factor enables libraries to prosper and successively serve their communities.

LIBRARY'S RACE FOR RELEVANCE IN THE 21st CENTURY

Libraries have been talking about the future for decades now. So, why are we still having the same conversations? Why are we not making headway? We are relying so much on our traditional tools for our decision making and thus ending up with traditional results. The following are the outmoded methods that we have employed and that have not really impacted effective information service delivery.

Look for Trends

much like the driver who monitors the cars around them, we become distracted by those around us. While yes, we can learn from one another, too often we become distracted by 'innovations' of other libraries and simply replicate. We allow ourselves to become followers instead of leaders. Look outward and forward. What is the NEXT thing? Simply put-by the time you read it in Library Journal it is old news. Someone has been there and done it. Does that mean you should not incorporate the idea? No! Go for it. But do not stop there. Use that innovation as a stepping stone to your next.

Ask Your Community What It Wants

Oh now this one will get me in trouble…but hear me out. When I was on faculty at a Washington State University, we took a student poll asking what services students would like to see in the library. "Beer"

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

was the #1 response. Yes, I know some countries do not serve beer in academic libraries- but that is a topic for another blog. The point here being, your patrons do not always know what they want! And they most certainly do not know the possibilities of what you could give them. Still not convinced? How many has someone said "I wished the library carried eBooks" or "I wish the library did… (fill one of a thousand other examples of something you already do)" We all bemoan that patrons do not know what the library offers. So why do we think they have the magic answer to our future. Librarians have debated "What is a 21st century library" for decades…WE have to find the answer. The response will let us know we got it right.

Using Statistics for Our Decisions and Direction

Just as with the driver focused on the space in front of him instead of the coming road, by the time we see these, they are behind us. If we are being honest, the majority of our data is at least a year old by the time we can use it for analysis. In addition, most of us would also agree that much of what we measure we do only for state requirements or our boards; not because we truly believe it reflects the interests and usage in our libraries. This leaves always responding never instigating. WE will never be able to set ourselves up for the curve if we are busy responding to old information. Am I saying that statistics are useless? Of course not, but they aren't going to get us to the future. They are a gauge that can be used to evaluate the effectiveness of the decisions we have made. But to make the truly edgy decisions there are rarely stats to lean on. This is where instincts and experience come into play.

You are the expert. You know your profession. You know what is needed. Be bold, trust yourself and move forward decisively even when those around tell you all reasons you will fail or should not try. As John Locke said, new ideas are always suspect for no other reasons than that they are new.

If we are to find our future, we must stop using outdated tools and methods. Instead, we must look to the future. See what is coming and head towards it, without excuse or apology. Look where you want to go and MOVE. So why is something that sounds so easy, one of the toughest skills to master? Simple! Keeping your eyes on the future and driving straight at it is hard because it forces you to trust your instincts and abandon the tools we traditionally use to keep ourselves safe and on course.

All those who stay on the edge or try what no one else has taken risk. Sometimes you fail. As with racing, the goal is, at best, to succeed and, at worse, survive the failure.

New Tools, Gadgets, and Devices in Libraries

New tools, gadgets and devices in libraries are the 'emerging' technologies that have brought contemporary advances and innovation in various fields of technology. These emerging technologies could be used to create seamless and safe embedded interactive learning spaces across diverse contexts. (Davidson & Goldberg 2009, DeViney & Lewis 2006, Hakkarainen 2009, Henschke 2010, Sharples et al. 2007, Traxler 2009).

The following however, are 10 most innovative tools, devices and techniques (ALA TechSource, June 2012.)

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

Cloud-Based Collection

Multimedia collections demand extraordinary precautions to ensure their integrity and preservation, especially in cases where the object may be unique. In the absence of a full-fledge trusted digital repository that conforms to digital preservation standards and best practices, libraries will need to provide as much redundancy and security for digital object files as possible. Two options are Amazon's S3 with Amazon CloudFront and DuraSpace's DuraCloud service.

One of the biggest advantages of Cloud computing is that it saves time, money and resources. You could store content in Amazon S3 and use your library's ILS to describe and present links to it. DuraCloud on the other hand, is based on open source software, provides an interface that would allow you to easily upload content. That information would then be distributed to one or more cloud-based storage devices, including Amazon S3, Rackspace, and Windows Azure.

Basic Mobile Website

Mobile sites and App generators offer everyone the opportunity to create a mobile view of their library data. Winksite is an easy-to-use tool that can create a website using a RSS feed from a WordPress or Drupal content management system. The dashboard features many options for creating different mobile page view and customization. You can add your library logo, etc. after which Winksite will show you a view of your finished page and the public URL for your patrons.

Location Based Photo Stream (With Instagram)

Featuring a powerful suite of location-aware technologies, Instagram claims more than 80million registered users who have shared nearly 4 billion photos. Following the lead of new outlets and other companies, libraries can expand social media campaigns and create a visual narrative around events, displays, collections, or projects. Library staff, for a start, can encourage patrons to snap photo of the library building and their friends at the library with Instagram.

Furthermore, library staff can establish hashtags so they can gather photo stream from staff and users around a theme, such as local history campus research project. You can also use QR codes to extend and market your Instagram program. Through an RSS feed, you can showcase images, photos shared on library staff and user accounts, or thematic hashtags. By associating your Instagram and foursquare accounts, you can manage the quality of the location information, enhancing topic resources with visual location elements.

Crowd-Sourcing

This can be used as a great tool for archiving. For instance, that is how all menus in its extensive collection of historical restaurant are transcribed and categorized.

Screencast

As librarians grow accustomed to screencast, more ideas and possibilities emerge for their use in instruction. With so many free recording and hosting options, all you need is a computer with internet access.

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

Creating screencast will be less daunting if you start by creating one for a small targeted group. Screenr, a free program works well for initial screen creation and experimentation. Publishing the screencast makes it available to everyone via Screenr website.

Google Voice

Google voice gives you a single number that rings all your phones, saves your voicemail online, transcribes your voice mail to text and allows you to send free text messages. You can use Google voice from your computer, tablet, or cellphone to respond to reference questions from patrons.

MentionMapp

MentionMapp displays connections among your followers (who are basically library users), along with the hashtags they are using. The interface is simple, yet the information it provides can be significant. However, you must create your twitter relationships with MentionMapp. To get started, sign in with your Twitter account and enter your Library's handle into search. MentionMapp scans your account's recent tweets and hashtags, along with those of your followers, and draws a map of connections along with hashtag labels. Lines between two entities indicate a connection.

Once you get the hand of navigating these connections and interpreting the data, you can begin to draw conclusions. For example, if you notice several library library followers using a hashtag, you know it's a topic of interest. You may want jump into conversation, whether to participate in the meme or to suggest library resources.

Blockchain Technology

This has been one of the most discussed technologies in the past year, as BitCoin has gained more and more power. Blockchain technology represents a decentralized data that keeps records of pseudomized digital transactions that are visible to anyone within the network. It is a new way therefore to collect and store data. According to Sue, blockchain technology "could be used to build and enhanced meta-data system for libraries, to keep track of digital – first sale rights and ownership, or even to support community-based borrowing and skill sharing programs."

The Internet of Things

IOT refers to "The possibility of connecting everyday devices, and the transferring of data between them; especially over the internet." An example is given in a recent article on American Library Association Website that there are many "opportunities for library applications, from tracking room usage and program attendance to monitoring humidity level for special collections and more".

Library Mobile Apps

Mobile Apps are a real trend right now, as people have access to and less time within mobile browsers. So why not connect with the patrons in a way they enjoy? A mobile app can extend the library's services outside their physical borders and facilitate the interaction with patrons.

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

An app that offers functionality such as a library catalogue, interactive library guides, a library virtual tour, an interactive calendar with all the library's events, the possibility of loan and read electronic books and articles, the possibility to reserve the library resources or to pay for some services represent a real benefits for the patrons, facilitating their activities.

METHODOLOGY

After collecting data from the interviews, focus groups and an extensive documentary consultation, I decided to categorize data in order to create final concepts. According to Lichtman, there are 6 steps that need to be followed in order to move from the categorization to the final concepts (2013, p. 252). It helped in organize our collected data in a very useful way. Sufficient documentary sources were consulted and read several times, together with observations of the focused groups and a number of interviews. Finally, i had to recognize and decide the strongest concepts. The final concepts should "reflect the meaning you attach to the data you collect" (Lichtman, 2013, p.254).

The final concepts however were:

New Technologies

Librarians were asked about their adjustment to the new technologies in their library. I took note of their feelings and perceptions concerning the new technologies. Concerning the adjustment to the new tools, gadgets and devices most of the librarians were positive, receptive, enthused, positive to challenges and open to new technologies. Most of them felt no fear with the integration of new tools, gadgets and devices in libraries or in librarians' working environment. Only a small percentage of librarians expressed that they feel unsafe, feeling fear of an unknown technology, a bit stressed and that they had addressed difficulties and misunderstandings in the beginning of the integration of new technology in their job. Many of the librarians stated the importance of exchanging ideas and help each other with the new tools, gadgets and devices. A big percentage of employees stated that new tools, gadgets and devices are part of librarians' job.

All the librarians stated the importance of education in new technologies. Many of them pointed out that in order to follow and adjust with new tools, gadgets and devices; there is a need to be educated. All of the librarians were open and positive to be educated in new technologies that support their job. During the interview process, I figured that librarians feel safer when education is conducted for their job as they gain valuable knowledge after the education. Moreover we felt that education is something that they like much and it is very helpful for them and their job, as they learn and understand technology. Some librarians stated that they acquired many skills after several seminars. Attending seminars facilitates librarians in order to learn and use new tools, gadgets and devices in their daily work.

Subsequently, the librarians expressed their perceptions about the differences between traditional and digital library. They referred to traditional desktops, manuscripts and card catalogues. Furthermore, most of the librarians supported that traditional librarians were modernized, adapted to the new gadgets, devices and used different tools that fit to the digital environment. According to them, digital library is the evolution of traditional library. Nowadays, libraries are hybrid as they include both analogue and digital material. Use of digital material requires expertise, education and dedication. Librarians seemed

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

to be satisfied and happy with the evolution of libraries. Librarians need to adjust to new era and use the new tools, gadgets and devices in their job.

Digital Material

Some respondents told me that users ask rarely for advice concerning the ethically way of using material. But some others opined that library's responsibility to educate users on how to use material in an ethical way. But after education, it I in his/her own decision if he/she will use the material in an ethical way or not. Almost all of the librarians said that digital material plagiarism is not more dangerous from analogue material plagiarism. It is more difficult to identify plagiarism in analogue material as there are no tools to identify easily and quickly plagiarism. Nowadays, there are tools that identify plagiarism in digital material and protect the copyright owners.

Preservation

Many of the librarians expressed their opinion concerning the preservation of born digital and digitized material in their library. Preservation is a big problem especially in academic libraries, as they suffer from the lack of the above-mentioned pre-requisites. Many employees supported that preservation is a very expensive process. There is no economic providence about preservation of material in academic libraries, for instance. During the interviews we felt that librarians were upset and disappointed with the lack of economic infrastructure in academic libraries. Moreover, several librarians expressed their opinion about the danger of information loss during a transition from one information system to another. A librarian said that the transition from old information system to new information system resulted to the 10% of data loss from the database. It was not good for them to lose so much data. Many librarians expressed their concern about the availability of digital material about the availability of digital material to future generations.

Economic Issues

All of the librarians affirmed that libraries face a very big economic problem. Nowadays, budgets on libraries are often very small. Moreover, due to either bad economics or misplaced priorities, libraries cannot always pay the publishers for the renewal of e-journals. If the contract is not renewed, the e-journals won't be accessible to its users on the libraries' databases. When libraries cannot renew the contract with the publishers they try to find alternative ways to meet the users' needs such as interlibrary loan. Many users expressed their disappointment when they were trying to find an article from the library's databases and it was not accessible as it was not paid.

EMPIRICAL METHODOLOGY

Data were collected from both librarians and library user in order to examine how users interact with librarians, and their perception about the new tools, gadgets or devices. The selected librarians were asked about issues concerning the new tools in libraries, their adaptation, interaction with users, preservation etc. Some librarians were asked about how the advent of new technologies in their libraries has affected

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

their skills, their knowledge and their education. Furthermore, they were asked about their adjustment to new technologies (New tool, gadgets and devices in libraries), for instance, their feelings and possible problems that they have addressed due to the technological change in their working environment.

On the other hand, library users were asked to answer if they use digital material, and in what way had an effect on them; beneficial or not. Digital material plays an important role in respondents' life as the majority of them use a number of them daily for studying, preparing notes, writing assignments, doing research and so on, and so forth. The research investigates library users' habits of using these new tools, gadgets and devices; as well as their varying experience.

The methodology for digitalization and or automation varies from library to library depending upon the policies and guidelines of the parent institution. The basic steps involved in digitization are setting clear-cut objectives for digitization, selection of materials to be digitized, selection of the 'right' technology (hardware and software) for digitization and the archiving or preservation of such digital materials. In the context of materials to be digitized for digital library are divided into four distinct categories, i.e. "legacy, transition, new and future. Legacy resources are largely non-digital resources, including manuscripts, print, slides, Maps, audio and video recordings. Transition are resources, primarily designed for another medium (mostly prints), which have been or had been digitized, making transition into the digital world. New digital resources are designed with a particular use in mind employing new internet and web technologies embodying a great variation and value addition. There is an increasingly wide range of digital resources from formally published electronic journals and electronic books through databases and data sets in various format, i.e. bibliographic, full-text, image, audio, video, statistical, and numeric data set. Future resources may contain dataset which are not formally specified. In conclusion, respondents were asked to assert, (i) if they use digital or/printed material, for what purposes, and how often, and (ii) if they use digital library resources or other digital resources, and for what reason.

CONCLUSION

Based on the findings, these varying tools and gadgets have greatly impacted the library promotional initiatives. Adaptation to social media platforms too has contributed immensely in changing the face of libraries. Instagram and Twitter for instance has also played a significant role in providing News feed and photo sharing. That said, libraries should use this application to promote other information such as digital repositories and reference services. In terms of variation of information, libraries' social media platforms should expand their scope to other informational materials, which abound. There has been a mantra among the connected librarians of the world over the last few years: "Don't be afraid to fail." Thomas Edison is often quoted for his sayings about failure, and one of my personal favorites is "I am not discouraged, because every wrong attempt discarded is another step forward." This is never truer than when it comes to libraries and technology. Not everything you try will succeed, and some experiments with hardware will just not click at all with your patrons, staff, or processes. And that is just fine; as a matter of fact, if you are not failing, then you are not trying enough things.

Gadgets give you the opportunity to show off new and exciting technologies to those who may never own one for themselves, in much the same way that libraries have found that providing computers and internet access was an important function of the late twentieth-century library. We are moving into the period of time when, as I said in the introduction, that 'content and container' are distinct. Librarians are very good at dealing with content. It is what we were trained for.

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

RECOMMENDATION

In order for libraries to keep abreast of present day technological trends, the following are the recommendations put forth for further library digitization. They include:

- Understand your library's community's needs related to new tools, gadgets and devices
- Become familiar with the types of new tools, gadgets and devices that can enhance library services and staff productivity
- Set up a multifaceted tech tool program
- Use these new tools efficiently and effectively
- Communicate effectively with a network of individuals with the same interests regarding technological tools
- Stay up to date new tools, gadgets and devices in your libraries.

Now that personal electronic devices like tablets, smartphones and digital cameras are ubiquitous, it is important for librarians to be able to incorporate these devices in to both library services and internal staff activity.

REFERENCES

Anbu, K. J. P., & Kataria, S. (2015). Access to library resources through portable devices: A pre-design prototype for creating library websites. *International Symposium on Emerging Trends and Tsechnologies in Libraries and Information Services*. 10.1109/ETTLIS.2015.7048162

Bomhold, C. (2013). Mobile Services at Academic Libraries: Meeting the Users' needs? *Library Hi Tech*, *32*(2), 336–345. doi:10.1108/LHT-10-2013-0138

Breeding, M. (2014). The Systems Librarian: Library Technology Forecast for 2015 and Beyond. *Computer Libraries*, *34*(10).

Brown, M. (2007). New Gadgets worth Exploring. *Library Hi Tech News*, *24*(8), 10–13. doi:10.1108/07419050710835956

Cherry, J. M., & Duff, W. M. (2002) Studying digital library users over time: a follow up survey of early Canadian online. *Information Research*, *7*(2). Retrieved from http://informationr.net/ir/7-2/paper123.htmlSs

Cummings, J., Merrill, A., & Borrelli, S. (2010). The Use of Handheld Mobile Devices: Their Impacts and implications for library services. *Library Hi Tech*, *28*(1), 22–40. doi:10.1108/07378831011026670

Edem, N. (2008). The Digital Age: Changes and Challenges to Librarians in Nigerian University Library. *Delta Library Journal*, *2*(1/2), 47–57.

Griffey, J. (2010). Gadgets and Gizmos: Personal Electronics and the Library. *Library Technology Reports*, *46*(3), 5–8.

Haber, S. (2011). *The Changing Role of Libraries in the Digital Age*. Retrieved from www.huffingpost.com/steve-haber

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

Khan, S.A., & Bhatti, R. (2012). Application of Social Media in marketing library and information services: A case study from Pakistan. *Webology, 9*(1).

ADDITIONAL READING

De Stefano, P. (2001). Selection for Digital Conversion in Academic Libraries. *College & Research Libraries*, *62*(1), 58–69. doi:10.5860/crl.62.1.58

Tennant, R. (2000). Selecting Collections To Digitized. *Library Journal*, *125*(19), 26.

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

Chapter 13
Library Markers Space in Academic and Public Libraries

Ayodele John Alonge
University of Ibadan, Nigeria

ABSTRACT

This chapter examines the library markers space in academic and public libraries. These spaces are specifically designed to meet the unexpressed needs of library users and to influence them to profitably engage in the library by creating physical or digital objects, which are open for the free use of all library users. Library makers space enables graphic arts, web design, and animation, and assists students in their projects that involve digital images. Nevertheless, factors such as lack of technical skills, inadequate power supply, and lack of trained manpower distort the application of library markers space in academic and public libraries.

INTRODUCTION

The University system is a multi-dynamic system been an institution that shares information and knowledge and it is a centre for discovery. The University also provides opportunity for skill acquisition and development of the students in various categories. As a result, in the word of Radniecki and Klenke (2017),universities look for ways to encourage innovation and entrepreneurship, and many academic libraries have begun providing access to maker resources and services. DeLaMare Science & Engineering Library became one of the first academic libraries to provide maker resources and services to anyone, regardless of discipline or even university affiliation. Therefore, a makerspace is only as vital to innovation and collaboration as its users are educated and skilled to use it. Users needed to learn how to 3D model and design in order to 3D print their own creations. They needed design and editing skills, such as Photoshop and Illustrator, to create complex designs and prototypes on the laser and vinyl cutters. Programming and hardware development skills were necessary to prototype on common makerspace electronics like Arduinos, Lego Mindstorms robotics kits, and Raspberry PisRadniecki and Klenke (2017). According to Makerspace Playbook (2013), makerspace is a physical place set aside for creative hands-on activities/ actions/ endeavors ranging from Arts and Handcrafts to Mechanics, Electronics, Web and App Development and more.

DOI: 10.4018/978-1-5225-9034-7.ch013

Copyright © 2020, IGI Global. Copying or distributing in print or electronic forms without written permission of IGI Global is prohibited.

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

The desire to meet the unexpressed needs of our library users and to influence them to patronize and profitably engaged in the library gave birth to the idea of makerspace known as "Digital Photography and Arts Makerspace (DPAM). Since the first official makerspace convened six years ago in a library in upstate New York, libraries have remained an ideal setting for makerspace events across the country. Many offer community resources like 3D printers, software, electronics, craft and hardware supplies, and more. One could argue that the phenomenon of makerspaces has led to a revitalization and reimagining of libraries in a digital world. As the means of circulating and accessing digital information outside of libraries continue to grow, this renaissance for the library as a place to gather, create, and collaborate has led to benefits for the host facilities just as much, if not more, than participants. Like book clubs, workshops, and other group meetings, hosting a makerspace alongside traditional offerings in a library is fast becoming the hands-on approach to learning and developing new skills. Many libraries at colleges and universities have incorporated program-specific makerspaces into their campus curriculum, bringing students together around a topic such as robotics or a particular fine art technique. The main objective of DPAM) is to create a community of library users for creative exploration using a variety of technology tools and process within the library environment. Specifically, Support the learning and the use of emerging technologies in the library, to connect the university community to the library, market the library, share and disseminate innovative ideas and for the production of digital information.

LITERATURE REVIEW

History of Making

To be a "maker" is to embrace a culture of experimentation and innovation. Makers are garage inventors, hackers, and collaborators. As Anand Giridharadas states in his 2011 *New York Times Magazine* article "The Kitchen-Table Industrialists:"

...the American romance with making actual things is going through a resurgence. In recent years, a nationwide movement of do-it-yourself aficionados has embraced the self-made object. Within this group is a quixotic band of soldering, laser-cutting, software programming types who, defying all economic logic, contend that they can reverse America's manufacturing slump. America will make things again, they say, because Americans will make things — not just in factories but also in their own homes, and not because it's artisanal or faddish but because it's easier, better for the environment and more fun.

The idea of "making" has certainly been around for a long time, but the term "maker" as we understand it now wasn't really used until the existence of *MAKE* Magazine. *MAKE* Magazine launched in 2005. The publication is devoted to people and projects that bring the DIY mindset to the technology movement. In 2006, the first Maker Faire was born. According to the Maker Faire website, Maker Faires are "...primarily designed to be forward-looking, showcasing makers who are exploring new forms and new technologies. But it's not just for the novel in technical fields; Maker Faire features innovation and experimentation across the spectrum of science, engineering, art, performance and craft." Maker Faires invite Makers to showcase innovative projects, and invite participants to learn and experiment with different hands-on activities. Maker Faires are now held annually in the Bay Area and New York City, and Mini Maker Faires are held all over the world.

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

Conceptual Definition of MakerSpace

There is no single definition of the word "makers". There are different perception towards its meaning. As Morin (2013) indicated, "You can think of makers as people creating physical things using the Web." According to Dougherty (2012), everyone is a maker. A maker can be someone who is gardening or someone who is building electronic toys. The rise of the maker movement stems from people's growing interest in engaging with physical objects and making things rather than just consuming them. More so, Wang, Wang, Wilson and Ahmed (2016), mentioned that three factors have helped build the maker movement. The first is the emergence of digital fabrication tools and software such as 3D printers, 3D scanners, laser cutters, Computer Assisted Design (CAD) software, etc. Such formerly expensive industrial tools have become personalized and available to individuals at a reasonable price. Second is the collaboration and innovation fostered by the Internet. Individual makers can now connect with others via the web to share ideas, learn technologies, create their communities, and work on projects together. The third and final element is the emergence of increasingly accessible and flexible factory services such as circuit manufacturing. Factories around the world can now take orders of any size and scale (Anderson, 2013). Makerspaces are part of a growing movement of hands-on, mentor-led learning environments to make and remake the physical and digital worlds. They foster experimentation, invention, creation, and exploration through design thinking and project-based learning. The movement aligns with President Obama's Educate to innovate initiative and his call to "think about new and creative ways to engage young people in science and engineering (and)..encourage young people to create and build and invent—to be makers of things, not just consumers of things." (Obama, 2009) in Institutes of Museum and Library studies (2014)

According to Loerstcher, Preddy, and Derry (2013), makerspace is a place to reinvent old ideas with new conceptual frameworks, utilize advancements in thinking and doing, and investigate and construct a hybrid of fine arts, sciences, crafts, industrial technologies, foods, inventions, textiles, hobbies, service learning, digital media, upcycling, STEM/ STEAM, and DIY (do it yourself) and DIT (do it together) concepts. In the word of Marsh, et al. (2017), creativity and innovation are key to engagement in makerspaces, and the concepts are closely intertwined. We could not be creative without some sort of innovativeness, something new or unusual. Innovation does not come about without creative thinking, and depending on how innovation is defined, it requires creative actions. Some scholars do not make a distinction between innovation and creativity (Georgsdottir, Lubart, & Getz 2003; Weisberg 2003).

Makerspaces are defined more by what they enable than what they actually look like. A makerspace can take many forms, from a mobile cart loaded with crafting supplies to a room full of computers, tools, and tables. Makerspaces are a combination of a traditional lab, artroom, shop and conference room, where hands-on learning takes place and people are encouraged to collaborate to turn ideas into reality. Makerspaces are all about getting hands-on and creating real-world projects using the tools and expertise on hand. The need for makerspaces comes down to two things (1) an urgent need for employees in STEM fields in the future and (2) the impact they have on student learning, including the development of problem-solving and critical-thinking skills (Pereira, n.d). Morin (2013) affirmed that libraries and museums have long embracing the maker movement. Sections of physical space have been turned into makerspaces and programs such as craft nights have been introduced into local communities. The growing shift from consumers of things to makers of things is going to have a transformative impact on the economy and future. According to Wang, et al. (2016), a makerspace is usually equipped with tools

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

and technologies for people to get together to work on projects and learn practical skills from each other. The Makerspace Playbook states that:

Makerspaces come in all shapes and sizes, but they all serve as a gathering point for tools, projects, mentors and expertise. A collection of tools does not define a Makerspace. Rather, we define it by what it enables: making. (2013).

The main focus of a makerspace is learning and education. A makerspace enables learners to become producers of knowledge, rather than consumers of knowledge. It encourages collaborative, hands-on, project-based, and experiential learning. Makerspaces are usually created in a community environment, such as a community centre, library, business, university or K-12 school campus (Wang, et al., 2016). According to Educause (2013), "A makerspace is a physical location where people gather to share resources and knowledge, work on projects, network, and build. Makerspaces provide tools and working room in a community environment - a library, community center, private organization, or campus".

Makerspaces provide access to tools, education, and community. They are great facilities for experimenting with emerging technologies, project development, idea prototyping and self-directed learning and discovery. Because of their hands-on learning nature, makerspaces have been quickly adopted in STEM education (science, technology, engineering, math). However, makerspaces are not only for scientific and technological activities. Increasingly, makerspaces serve the educational need in fields other than STEM (Wang, et al., 2016). The Library as Incubator Project (2012) defines makerspaces as, "collaborative learning environments where people come together to share materials and learn new skills", and concludes that, "makerspaces are not necessarily born out of a specific set of materials or spaces, but rather a mindset of community partnership, collaboration, and creation."

According to the 2014 New Media Consortium (NMC) Horizon report, there has been a growing interest in makerspaces as a result of the broad integration of creative processes and hands-on learning. Institutional leaders are increasingly viewing their students as creators rather than consumers; the expert panel expects this trend to peak within three to five years. In the 2015 and 2016 NMC Horizon reports, makerspaces were identified as one of the mid-term (2-3 years) key trends accelerating technology adoption in higher education. The Maker Manifesto (Hatch 2013) attempts to identify some of the principles that are representative of the 'MakerMovement':

- **Make:** Making is fundamental to what it means to be human. We must make, create and express ourselves to feel whole. There is something unique about making physical things. These things are like little pieces of us and seem to embody portions of our souls.
- **Share:** Sharing what you have made and what you know about making with others is the method by which a maker's feeling of wholeness is achieved. You cannot make and not share.
- **Give:** There are few things more selfless and satisfying than giving away something you have made. You must have access to the right tools for the project to hand. Invest in and develop local access to the tools you need to do the making you want to do.
- **Learn:** You must learn to make. You must always seek to learn more about your making. You may become a journeyman or master craftsman, but you will still learn, want to learn and push yourself to learn new techniques, materials and processes. Building a lifelong learning path ensures a rich and rewarding making life and, importantly, enables one to share.

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

- **Tool Up:** You must have access to the right tools for the project to hand. Invest in and develop local access to the tools you need to do the making you want to do. Tools for making have never been cheaper, easier to use or more powerful.
- **Play:** Be playful with what you are making, and you will be surprised, excited and proud of what you discover.
- **Participate:** Join the Maker Movement and reach out to those around you who are discovering the joy of making. Hold seminars, parties, events, maker days, fairs, expos, classes and dinners with and for other makers in your community.
- **Support:** This is a movement, and it requires emotional, intellectual, financial, political and institutional support. The best hope for improving the world is us, and we are responsible for making a better future.
- **Change:** Embrace the change that will naturally occur as you go on the maker journey. Since making is fundamental to what it means to be human, you will become a more complete version of you as you make (Hatch, 2013).

Makerspaces are of several types including Hackerspaces, Fablabs, Creative space, Techshops etc, each having their own unique characteristics. A hackerspace is a community operated workspace where people with common interests, usually in computers, mass production, science, technology, digital or electronic art, can meet, socialise and collaborate. Hackerspaces have also been compared to other community operated spaces with similar aims and mechanisms such as Fab Lab, started in 2006 by a MIT Professor Neil Gershenfelh, which provides up-to-date designs like electronic appliances, laser cutters, routers, etc., appropriate for makers allowing them to generate anything. Basically it is a platform for learning and innovation. They are likely to be smaller, i.e., 1000-2000 sq ft when compared with other spaces (Hussain and Nisha, 2017).

MakerSpaces in Libraries

A Makerspace is an evolutionary step in library facilities' design and programming." Incorporating a whole host of activities like robotics, engineering, sewing, coding, carpentry, cooking, electronics, rockets, furniture making, anything that sparks curiosity and engages critical thinking can be part of the maker movement (Loerstcher, Preddy, and Derry, 2013). The main function of makerspaces in the library is that they connect different members (Library users) of academic discipline, create a neutral space where people can share creative ideas, help students acquire and refine news skills in digital photography, graphic arts, web design and amination, assist students in their projects that involve digital images and help build relationship with innovative companies for funding and research development. More so, along with the skills necessary to fully utilize equipment, programs, and services in the makerspace, there are complementary skills which help support many of the projects being developed. One such knowledge and skill set is intellectual property. The library saw many never-before-created objects being 3D printed and built in its space and as longtime experts in intellectual property, saw the opportunity to provide avenues for users to learn about patents and trademarks (Radniecki and Klenke, 2017). Tashjian (2014) stated that "makerspaces are shifting educational and public organizations from being places where things are made or information is found to places where knowledge and ideas are developed and imagination and creativity are fostered." As an educational and public organization, the library is also undergoing this transformative shift. Tod Colegrove, director of the DeLaMare Library, said that a noisy library

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

with a messy innovation workshop is actually a return to the library's origin (Rutkin, 2014). According to Wang, et al. (2016), learning from books is no longer the only way of acquiring knowledge. Modern society requires students to have highly specialized skills in technology. The best way to acquire this kind of knowledge and skills is through hands-on learning.

The idea of making or makerspaces in libraries is not new. The Manitoba Crafts Museum and Library was created in 1933 for preserving the heritage of craft culture of Manitoba. The library was also used as a meeting place and provided resources for learning craft skills such as knitting and quilting (Manitoba Crafts Museum and Library, 2014). Fleming (2014) mentioned that "In 1960, the Nebraska Public Library Commission hosted a variety of special activities, including creative arts, which were organized by area groups." The first tool lending library, Rebuilding Together Central Ohio Tool Library, was founded in 1976 in the City of Columbus, Ohio. Today, this unique tool library is open to the people of Franklin County, lending out 200 varieties and close to 4,500 tools. The community can borrow tools and access a variety of informative resources about making (Rebuilding Together Central Ohio, 2014). Makerspaces come in all shapes and sizes. Some are fixed rooms or structures, and some are temporary. Whether a Makerspace contains thousands of dollars' worth of equipment, or is simply a cart full of tools, the goal of a Makerspace is to facilitate making. The reality for most libraries is that we don't have a dedicated space in which to make stuff. But we do have the capability to encourage making at our libraries. Making means learning through trial and error, through practical application, and through hands-on experience in a social environment. Making means giving access to communities to grow and create something better Loerstcher, et al., 2013).

Historically, libraries have encouraged life-long learning through their collections and programs. This, combined with the revived interest in making, has led to the emergence of a new type of library space, one equipped with new digital tools such as 3D printers and laser cutters. The Fayetteville Free Library, the New York Public Library, the Westport Public Library in Connecticut, the Chicago Public Library, and the DeLaMare Science and Engineering Library at the University of Nevada, Reno are all examples of this trend. These library makerspace pioneers are igniting a new wave of library transformation in the 21st century.

The establishment of library is to support the mission and vision of her mother institution such as to provide teaching, learning and research for knowledge and skills acquisition. The library also have her role to play in the provision of her services to clients. Therefore, library service pledge to utilize innovative technology and strategies in her services, library strategic plan, create a modern facility that leverages state-of-the-art space design, technology and innovation to meet the needs of her users, ensure that the library's infrastructure (technology, tools, staff), supports 21st century teaching and learning needs (Wong-Welch and Keven, 2018). The goal of makerspaces in the library is achievable based on its consonance with that of the library. The goal of makerspaces aims at reducing barriers so that people can learn and start creating their resources and collections. According to Wong, Makerspaces are, "places that help cultivate creative interests, imagination, and passion by allowing participants to draw upon multiple intelligences. They are an effective means of applying knowledge, and they tap new resources for learning (Hussain and Nisha, 2017). Bagley (2012) explained that "the maker movement in libraries is about teaching our patrons to think for themselves, to think creatively, and to look for do-it-yourself solutions before running off to the store." Therefore, a key role for a library makerspace is to help create creative people. Throughout the process of creating this learner-centered and multifaceted Makerspace, according to Branigan-Pipe (2017) the teachers involved gained:

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

1. Stronger understanding of the complexity in creating a learning environment that incorporates the Reggio Emilia and Montessori and Waldorf Methods in a public-school setting and how this connects to the student-centred approach and current pedagogies
2. Valuable collaboration and team building skills associated with design thinking, action research, teacher inquiry, problem solving and the creation of lessons that were cross-curricular and used a constructionist approach
3. A greater understanding of networking and professional development through social networking tools like Twitter, Blogging and Instagram as well as presentation skills at conferences and showcase events
4. A stronger understanding of Makerspace tools and projects and implementation in a meaningful way
5. A meaningful way to connect practice to pedagogy
6. Opportunity to practice creating classroom lessons that focused on a variety of conceptual frameworks and being able to articulate each framework depending on the context, the environment, the teacher and the learner
7. The opportunity to create teacher through the implementation of lessons and experimentation with the tools themselves
8. A developed (ongoing) framework to create a human centric makerspace

A case study report by Pryor (2014) on "Makers in the library: studies of 3D printers and maker spaces in library setting showed that, academic library makerspaces have reported providing workshops, access to learning aids, and consultations to help users 3D print, but none focus on how workshops or consultations are being conducted, what content is being taught, and whether any of the avenues of information provision were successful. A workable 3D printers according to Radniecki and Klenke (2017) are essentially the same as paper printers. A file is uploaded, for example, a STL file instead of a Word document, and the user chooses the command to print. Depending on the model of 3D printer, the user may also have to adjust some of the physical properties of the printer including loading filament, calibrating the printer, and other conditions depending on the job being printed. 3D printing allows for more authentic exploration of objects that may not be readily available to schools, including fragile items like fossils and artifacts. The exploration of 3D printing, from design to production, as well as demonstrations and participatory access, can open up new possibilities for learning activities.

This Makerspace classroom is separated into many spaces and at the time of the design, the space was inspired the Montessori approach of teaching that recognizes that space is an important part of the learning process and that learners need the opportunity to explore, experiment and have access to a variety of tools and resources. The following describes the initial spaces that were implemented:

1. **MakerSpace:** A large part of the room is dedicated to a MakerSpace where students can build, engineer robots, take apart machines and co-create their own computers or devices.
2. **Laptops:** One side of the room is reserved for group laptops, iPads and an Apple TV for sharing.
3. **Design and Engineering:** There is a 3D Makerbot printer along with tablets and computers allocated specifically for design and engineering.
4. **Math and Science:** There are two hubs – one for Science and one for Math exploration – with a shared Interactive Smartboard for small group activities.

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

5. **Health and Fitness:** Here you will find a small herb garden and literature dedicated to healthy living, as well as a worm composter.
6. **Social Justice and Critical Literacy:** There is a strong emphasis on Critical Literacy. Inquiry questions and Big Ideas provide the focus for exploration of Millennium Goals/United Nations Sustainable Goals and for both guided and self-directed learning.
7. **Literacy:** A writing centre provides resources such as Livescribe Pens, Journals (for co-written topics) and a variety of choices for students to write and share at their level and interest.
8. **Arts:** There is a ceiling-to-floor Green Screen for filming, along with a puppet display for drama. The piano and guitar are rarely quiet. Even during group inquiry time, students use self-directed breaks to paint or draw or listen to music. (Branigan-Pipe, 2017)

As the maker movement flourishes, libraries – especially public and academic libraries have embraced the opportunity to create makerspaces and programs serving youth and adults alike. More so, maker-focused programs inspire and empower people to make, create and learn new skills. Offering resources such as laser cutting, computer programming, 3D printing, self-publishing, welding and collaborative work spaces, maker-focused programs are helping new makers develop prototypes and business models and inspiring next-generation. There are collection of resources in library makerspaces. Reports showed that he DeLaMare Library currently provides access to a number of maker technologies and services. Larger equipment includes multiple 3D printers, Artec 3D scanners, a laser cutter, vinyl cutter, PCB milling machine, soldering bar, and sewing machine. The lending technology collection includes other items commonly found in makerspaces, such as Sparkfun Arduino Inventor kits, Raspberry Pis, hand tools, and a variety of virtual reality headsets including the Oculus Rift and HTC Vive. While some tools and technologies require little prerequisite knowledge to fully utilize, such as hand tools or even soldering irons, others demand complex skill sets in order to take advantage of their full capabilities (Radniecki and Klenke, 2017).

According to Anderson (2012), the rise of makerspaces as a concept began around 2005 with the beginning of *Make:* magazine and its promotion of creative projects and methods for making. The United States and internationally showcased the efforts of makers. Afterwords, libraries began to host making activities in their programming options and to establish dedicated makerspaces. Librarians also began to recast some of the creative activities and devices already present in their buildings as making activities, such as video and audio capture, large format printing, art-related workshops, music recording spaces, and so forth. With an international network of makers already present and sharing their projects, techniques, and technologies, library staff members could build on their initial inspirations and develop larger makerspace programs (Burke, 2015).

Makerspace in the library meet the unexpressed needs of library users, influence them to patronize and profitably engaged in the library, woo library users to the library to remain relevant in the technological world. Makerspaces provide resources and students are guided on how to solve problems through creation, and also offer guidance and examples of products to inspire the learner to deeper understanding of the products. Reports has showed that the application of makerspaces mostly in academic and public libraries has been primarily guided by the environments in which they operate. While there are common elements to every makerspace, those in academic libraries do exhibit some differences. When academic library responses were isolated from the author's survey, they illustrate something of a different focus (Burke, 2015). In the word of Branigan-Pipe (2017), makerspace environment is collaborative in nature, and can occur at a school, a library, a classroom, a shared workspace, a community church, a garage,

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

or a backyard – it is a space where individuals (who are interested in creating, making, fixing, talking, exploring, inventing, and discovering) get together, and it is usually done through self-motivation and direction, personal interest, and with a willingness to share, learn, and work with others regardless of age, gender, or ability. In creating a makerspace in the library, the following are required:

1. Designated area away from learning areas or quiet reading areas
2. There must be available power source
3. Quality signage and storage
4. Create easy access to materials and supplies
5. Create a schedule to allow small groups or whole classes to use Makerspace
6. Develop small Makerspace stations for multiple activities or
7. Limit the Makerspace to a select few activities or
8. Set up a 'maker cart' that can travel around the library or to classrooms

Study by Burke (2015) showed the 16 most common technologies and activities from academic library makerspaces such as websites, digital photos, programs, apps, and games. Arts and crafts, tinkering, and the well-represented category of "Other" have dropped from the list entirely. The contents of that "Other" list tended to include more physical making activities (such as button making, hand tool collections, and LEGOs), and may further point to an academic library makerspace tilt toward digital creation. It is possible that, at least among the surveyed libraries, academic makerspaces tend to be focused more on discipline-related projects that involve product modeling and prototyping for engineering, design, or marketing. That might account for the higher ranking of those activities. It might further indicate that academic library makerspaces tend to be created to meet curricular goals at an institution rather than as venues for independent discovery and creation activities. According to Burke (2015), other reasons why library staff members have decided to pursue makerspaces are:

1. They exist to bring individual makers into a space with shared resources.
2. They are spaces in which experienced makers can teaching skills and guide the progress of newer makers.
3. They allow for the sharing ideas and designs not just within the makerspace, but outward to the larger world of makers.
4. They enable individuals to collaborate on projects and bring multiple perspectives and skill sets together.
5. They encourage individuals to experiment and discover through tinkering with technologies and products and to approach making with a spirit of play.

Moorefield-Lang (2015), analysed the user agreements of makerspaces in public and academic libraries. The study found that the makerspaces are a very exciting topic in the field of library science at present; the application of a maker learning space is still new to many libraries. The Mississippi Department of Education highlighted the basic steps for building makerspace resource library:

1. Get at least one or two books geared towards maker educators to help expand knowledge
2. Start building up a collection of makerspace picture books in an elementary library
3. Add a variety of project books that can help students to build up maker skill sets

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

4. Find books that can offer visual inspiration
5. Make a list of all the tools and materials available in the makerspace - get a least one or two books on each of these tools.

THE CONCEPTUAL FRAMEWORK

Figure 1 is a representation of the conceptual framework for this study. As depicted, the four categories of librarian, academic staff, students and community are interconnected via purpose. The people in a Makerspace provide, request for, and dictate the means used, the means determine the activities that may be possible in the space, and the activities contribute to people's experiences which include their learning experiences. At the same time, the people and their interests, goals, and experiences dictate the activities that take place in a Makerspace, the activities determine which means are needed, and the means influence what people do in the space. Depending on the purpose behind the space, each Makerspace could be variably focused toward either the librarian, academic staff, students, the community, or combination of all.

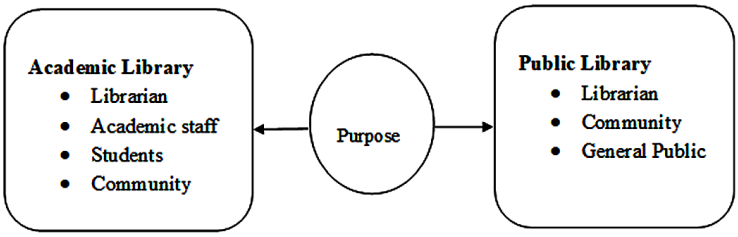
Purpose as represented in the framework, the purpose of a Makerspace defines which aspect(s) the space focuses on. The purpose of a space could be librarian-focused, academic staff-focused, students-focused or community-focused, or some variable combination. All aspects of the framework always exist but sit at tension with the variable focus of the space. The purpose of a Makerspace could be defined when the space is initiated, such as Makerspaces in educational settings, which are set up for meeting educational needs or outcomes. The purpose could also be continually evolving as many spaces redefine their nature depending on the contexts they are situated in. Examples of such spaces include community spaces which are not set up for a particular reason but dynamically evolve.

MAKERSPACES THEORY

Theories of Constructivism and Constructionism by Jean Piaget's and Papert (1980)

This theory is based on Jean Piaget's theories of constructivism and constructionism by Papert (1980). Jean Piaget's theories of constructivism are being discussed and implemented as part of new pedagogies in the 21st century. Makerspaces are very popular in the 21st century learning context because such

Figure 1. Conceptual framework



Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

approaches are so closely linked to constructivist theorists whose research – for many decades – has pointed to the fact that when students are active participants in their learning through play and making, they are engaged in their own learning process. This, then, enables deep and meaningful learning to take place. As this resource aims to demonstrate, and as pointed out by Resnick (2015), that "just making things is not enough".

Lee Martin, of the University of California (2015), also points out in his detailed research on the Maker Movement in Education, that, the history of the adoption of computers in schools suggests a lurking danger: The Maker Movement that assumes its power lies primarily in its revolutionary tool set, and that these tools hold the power to catalyze transformations in education. Given the growing enthusiasm for making, there is a distinct danger that its incorporation into school settings will be tool centric and thus incomplete. There are many different approaches to making things, and some lead to richer learning experiences than others. Moreover, most involve the integration a variety of curriculum with many layers, real-world learning, and the use of a cross-curricular approaches using real-world problems and critical thinking. Ultanir (2012) researched and wrote a detailed description of the constructivist learning theories entitled, "*Constructivist Learning in Dewey, Piaget, And Montessori.*", Ultanir (2012) emphasizes that there are many connections to John Dewey's assertions that our experiences are vital to authentic learning; firstly, Jean Piaget asserted that the basis of learning is discovery, and secondly, Papert's research recognized and declared that that knowledge is not transmitted, but constructed – literally, through the process of making.

Piaget's theories of constructivism were inspired by the belief that children are not empty vessels to be filled with knowledge, but instead are active builders of knowledge (Igafo-Te'o, 2002). In Piaget's theory of constructivism, knowledge is not about information to be delivered, memorized, retrieved; it is an experience that is acquired through interaction with the world, people and things (Ackermann, 2001). One of the common threads of constructivism that runs across all these definitions is the idea that development of understanding requires the learner to actively engage in meaning-making. The real understanding is only constructed based on learners' previous experience and background knowledge. It maintains that individuals create or construct their own new understandings or knowledge through the interaction of what they already believe and the ideas, events, and activities with which they come into contact. (Ultanir, 2012)

Constructionism Theory

Constructionism, Makerspaces and deep learning go hand-in-hand, as recognized by Papert (1980) of Massachusetts Institute of Technologies (MIT), who developed a theory of learning based upon Piaget's constructivism. Papert (1980) asserts that, "children build their own intellectual structures with materials drawn from the world around them". What is different from Piaget's theories, however, is that Papert (1980) maintains that learning occurs through making rather than overall cognitive potentials and thus, his approach – *constructionism* – helps to understand how ideas get formed (Ackermann, 2001).

Noss and Clayson (2015) describe the concepts behind constructionism beautifully in their article *Reconstructing Constructionism* in saying, "when we build, we build with things – not just ideas ... if we design properly, the things we build with have an epistemic foundation – of 'powerful ideas'". Papert (1980) also asserts that, "children build their own intellectual structures with materials drawn from the world around them".

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

MakerSpaces in Academic Libraries

The library makerspace trend started with public libraries, but more and more academic libraries are recognizing the benefit of makerspaces and their relevance to their strategic mission. This emerging trend can bring faculty and students together across disciplines, facilitate collaborative and hands-on learning, encourage knowledge sharing and creation, and help academic libraries adapt to the ever changing needs of their community (Wang et al., 2016). Makerspaces in Academic library became important as they create opportunities for hands-on learning, co-working, STEM activities, prototyping, tinkering, and experiencing an open culture (Burke, 2015). Opara (2001) posits that the library stands in the same relationship to the society as the memory of an individual by making available and accessible to its users information required for teaching and independent study. The main purpose of an academic library as stated by Aina (2004) is to support the objectives of an academic environment in the areas of learning, teaching, research, and service.

Burke (2015), demonstrated and elaborated the rise of library makerspaces, making activities and technologies in library a makerspaces, profile of academic library makerspaces, and how makerspaces connect to learning in higher education, motivations for creating a makerspace, some considerations when planning a makerspace, and justification for an academic library makerspace. All libraries, the six significant categories for library makerspace creators were discussing, that is, supporting learning, encouraging collaboration, providing access, expanding library services, following the library's mission, and providing opportunities for individual creation. Jubb and Green (2007) observe that academic libraries have for centuries played critically important roles in supporting research in all subjects and disciplines within their host universities or colleges. Guskin (1996) notes that the use of university libraries promotes active learning, thus contributing to students' ability to think critically and work well independently or in group. An academic environment without a library is tantamount to a person without a brain. Okpala (2016), in his word has highlighted the concept of makerspaces and its apparent benefits in academic libraries in Nigeria. The findings of the study display that users attention is drawing towards library for fostering creativity and invention. Makerspaces offer highly rewarding services to students, faculty members, and staffers and make them learn new things, working with their peers, considering new ideas, exploring, tinkering, and inventing. Training and workshop opportunities for librarians were proposed to make them well equipped with makerspace skills.

In 2015, the Association of Research Libraries (ARL) conducted a survey of its 124 ARL member libraries to gather information for senior library staff to support decisions related to engagement with 3D printing, rapid fabrication and digitization technologies, and makerspaces in general. A Rapid Fabrication/Makerspace Services SPEC Kit (Association of Research Libraries, 2015) was developed based on the survey results. Among the 64 libraries that responded, offering makerspaces services appear to be of significant interest to ARL libraries, and a substantial majority of the responding libraries are currently engaged with makerspace service deployment. Respondent comments about the role of makerspace in their libraries are overwhelmingly positive: makerspaces are noted for fostering innovation, creativity, active learning, and scholarly communication etc. A number of respondents emphasized that the core competitive advantage of the library is not in providing hardware or simple physical space but in creating an environment that combines service, space, and expertise to foster individual and collaborative "investigation, interrogation, and learning through doing" (Wang et al., 2016).

According to Wang et al. (2016) in the SPEC kit, ARL also outlined the strategic relevance of makerspaces to research libraries. First, makerspaces represent a unique use of library space. The assessment

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

and renovation of libraries' use of space has been recognized as a current strategic issue for libraries in general. Second, libraries are increasingly engaging with data management. Digitization and fabrication technologies both make use of and produce research data. Third, fabrication is becoming increasingly important throughout the various stages of research lifecycles. There is a clear trend towards adoption in higher education generally. These technologies may be used early on as part of prototyping for research or to embed sensors for research data collection, or later on as part of analysis or research collaboration.

MakerSpaces in Public Libraries

Public libraries have always played a very important role in facilitating literacy and learning. By providing the general public with access to new technologies, public library makerspaces can help develop a new generation of workers who will build a stronger economy (Scott, 2012). Many public libraries according to München (2001) have responded to the challenge of the electronic revolution and taken the opportunity to develop services in new and exciting ways. There is, however, another side to this story. The United Nations Human Development Report 1999, while stating that the Internet is the fastest growing tool of communication ever, revealed that South Asia with 23.5% of the world's population has less than 0.1% of the world's Internet users. A quarter of the countries of the world has less than one telephone for every hundred people. To take advantage of the opportunities information and communications technology present there is a basic need for literacy, computer skills and a reliable telecommunications network. The risk of a growing gap between the information rich and the information poor has never been greater. This gap is not just an issue between countries at different stages of development but also between groups and individuals within countries.

Libraries still struggle with the outmoded public perception that we exist primarily to provide access to information. Additionally, the traditional concept of literacy is no longer adequate, which has implications for libraries in terms of what community members need from us. As stated by Scott in "Making the Case for Public Library Makerspace, "One of the traditional roles of the public library in society is facilitating the creation of knowledge in our communities. Promoting literacy through instruction has long been a part of the librarian's job. Today, the concept of literacy encompasses much more than just reading and writing; it has evolved into "transliteracy," commonly defined as the ability to read, write and interact across a range of platforms and tool." (Scott, Sarah. Public Libraries Online. Public Library Association, Nov. 11, 2012. Online. February 14, 2014.) Additionally, there is a growing concern in the U.S. that young people today are not gaining the skills they need to be successful in a 21st century workforce. Making has been shown to be an effective tool to help young people build 21st century skills and inspire them to consider STEM-focused careers. By embracing the maker movement, libraries can increase their relevance to the community by becoming a place that helps provide youth with the skills they will need to succeed in the workforce.

Public libraries have an exciting opportunity to help to bring everyone into this global conversation and to bridge what is often called 'the digital divide'. They can achieve this by providing information technology for public access, by teaching basic computer skills and by participating in programmes to combat illiteracy. However, to fulfil the principle of access for all, they must also continue to maintain services that provide information in different ways, for example, through print or the oral tradition (München, 2001). These are likely to remain of vital importance for the foreseeable future. While becoming the gateway to the electronic information world should be a key objective for the public library,

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

every effort must be made not to close other doors through which knowledge and information can be provided. According to IFLA/UNESCO Public Library Manifesto (1994) define public library as:

the local gateway to knowledge provides a basic condition for lifelong learning, independent decision-making and cultural development of the individual and social groups.

Public library provides access to knowledge, information and works of the imagination through a range of resources and services and is equally available to all members of the community regardless of race, nationality, age, gender, religion, language, disability, economic and employment status and educational attainment. The goals and objectives of public library embrace makerspaces as its centre on knowledge with the use of information technology. In a Public library setting, library makerspaces traditionally catered for craft-focused activities like knitting, crocheting and sewing. The primary purpose of public library is to achieve this by providing resources and services in a variety of media to meet the needs of individuals and groups for education, information and personal development including recreation and leisure. They have an important role in the development and maintenance of a democratic society by giving the individual access to a wide and varied range of knowledge, ideas and opinions (München, 2001).

The evolution of technology and resurgence of do-it-yourself culture has led to a change in programming offered in some of these spaces toward a focus on science, technology, engineering and mathematics (STEM) (Slatter and Howard, 2013). In public libraries, makerspaces and other creative places are emerging to meet the creative, social, educational, and innovation needs of individuals and communities. According to Barniskis (2016), these spaces are participatory social and spatial arrangements aimed at least in part at creating physical or digital objects, which are open for the free use of all library patrons, irrespective of the types of workshops, tools, staffing, materials created, or location. Reports of such spaces often present them as "empowering," but little has yet been published on library user or personnel perceptions of this presumed empowerment. Britton (2012) emphasised that makerspaces are places where people come together to create, collaborate, and share resources and knowledge – an idea and concept that fits perfectly with the mission and vision of public libraries. With the use of makerspaces, library users are not merely consumers of information, they are also creators of information. In the word of München (2001), learning does not end with the completion of formal education but is, for most people, a lifelong activity. In an increasingly complex society people will need to acquire new skills at various stages of their life. The public library has an important role in assisting this process.

München (2001), further recommend that the public library should provide material in the appropriate media to support formal and informal learning processes. It should also help the user to make use of these learning resources effectively as well as providing facilities that enable people to study. The ability to access information and make effective use of it is vital to successful education and, where possible, public libraries should co-operate with other educational organizations in teaching the use of information resources. Where adequate library facilities exist to support formal education the public library should complement them rather than duplicating library provision available elsewhere. This process of information provision in the support of formal and informal learning process could be said to be one of the social role of public library. According to München (2001), the public library in the library makerspaces has an important role as a public space and meeting place. This is particularly important in communities where there are few places for people to meet. It is sometimes called 'the drawing room of the community'.

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

Use of the library for research and for finding information relating to the user's education and leisure interests, brings people into informal contact with other members of the community. This is because makerspaces in the library enable mentor-led learning between students, teachers, and other members of the school community. More so, using the public library can be a positive social experience. Public libraries maintained their specific roles irrespective of any development in the system. Therefore, it cannot set back from their established roles i.e. culture, education, reading, literacy, and information. The most widely accepted definition of a public library was formulated by UNESCO in 1949 which was later revised in 1972 (UNESCO 2004). According to UNESCO manifesto, the definition of a public library is as follows:

1. Public Library is financed for the most part out of public funds.
2. It charges no fees from users and yet is open for full use by the public.
3. It is intended as an auxiliary educational institution providing a means of self education which is endless.
4. It houses educative and informative materials giving reliable information freely and without partiality.

The functions of public library is in consonance with library makerspaces. The function as highlighted by Handa (2015) are as follows:

1. **Access to Tools of Information and Education**: It is the primary function of a public library to select and to organize need-based literature and other means of information and education suitable to the requirements of the local community in which the library is located.
2. **Instrumental in Informal Self-Education**: Public library is one of the agencies on which an adult heavily relies. It proves him/her suitable learning material to develop his/her skill and competence in areas of interests. Self education may be obtained through a public library such as methods of agricultural operations, scientific methods of poultry, bee keeping etc.
3. **To Promote Cultural and Social Activities**: A public library lends active support to many socio-cultural groups, such as children's club, youth forum, dramatic club, teachers association, lawyers or doctors associations, film society etc. to conduct their activities through its premises or through its rich informative, educative and cultural materials.
4. **Preservation of Local Material**: Another important function fulfilled by a modern public library is to identify and collect cultural material of importance available in its jurisdiction. These may be works of art or sculpture, paintings, documents, musical instruments etc. In a nutshell, a public library goes in search of all such materials which link the people of the locality with its cultural past.
5. **Strengthening of Democratic Spirit**: By bringing together in its socio-cultural activities seemingly different segments of the society on a single platform, the library slowly develops a sense of amity, a sense of respect for other groups, an appreciation of the differences in languages, religion, customs and manners. Thus sectarian life styles are substituted by democratic life patterns. In this sense, a public library justifies its existence as a democratic institution.

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

The rapid growth in the volume of available information and the continuing technological changes, which have radically affected the way information is accessed, have already made a significant effect on public libraries and their services. Information is very important to the development of the individual and of society, and information technology gives considerable power to those able to access and use it. Despite its rapid growth it is not available to the majority of the world's population, and the gap between the information rich and the information poor continues to widen. A vital role for the public library is to bridge that gap by providing public access to the Internet as well as providing information in traditional formats. Public libraries should recognize and exploit the opportunities provided by the exciting developments in information and communications technology. They have the opportunity to become the electronic gateway to the information world (München, 2001). München (2001) therefore suggested that librarians should be imaginative in seeking external sources of funding for the public library. However, they should not accept funding from any source if, by so doing, the fundamental status of a public library as an agency available to all is compromised. Commercial organizations, for example, may offer funding with conditions which might prejudice the universal nature of the services provided by the public library.

DISADVANTAGES OF LIBRARY MAKERSPACE

Low level of investment and low funding of the library that inhibit a befitting structure could be a barrier for makerspaces in the academic and public library. For some libraries, initial investments required to set up a makerspace can prove a barrier to implementation (Greenwalt, 2013). More so, some items commonly used in these spaces can be dangerous if not used properly. However, many makerspaces aren't necessarily technology focused, and can be low-cost, reducing some of these risks. As s new phenomenon, this has created a unique set of challenges for participants, who are often trying things for the very first time. Participants found it a particular challenge to translate the value and relevance of new and different programs and technologies to those who are used to a more traditional library model (Slatter & Howard, 2013). Another possible challenge was budgetary constraints. While some funds were relatively simple for participants to procure, the changing nature of the technology and high cost of importing these items sometimes proved challenging.

According to Mississippi Department of Education (n.d), budgets can be one of the most difficult aspects of being a librarian or to own a library. Nevertheless, a makerspace does not need much of a budget to operate. Tools and supplies can be donated or borrowed and many projects can be self-funded with community and parental involvement. However, there is always a new gadget or piece of technology to purchase and try. Develop a baseline budget and what type of Makerspace to offer before purchasing. If there is a gap in funding there are numerous options for receiving grants or donations to fill the void.

CONCLUSION

Makerspace in Libraries is a collaborative effort put into place by professional librarians in the academic and public library to achieve the mission and vision the library. This is to further improve teaching, learning and research. More so, makerspace gives the arm puts opportunity to the library users to be creative. Library user of this 21st century is not just to sit quietly and consult books and other pedagogical materials but they have completely transformed into a spot where users can interact, create and collaborate. Mak-

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

erspaces are the demand of modern libraries and expected to be a growing trend in the years to come. The idea of establishing makerspace in the library fosters creativity and invention. Makerspace in the library meet the unexpressed needs of library users, influence them to patronize and profitably engaged in the library, woo library users to the library to remain relevant in the technological world. However, significant challenges were also identified to their successful implementation. In particular, budgetary constraints, resistance to change within organisations, lack of technical skills, inadequate power supply and lack of trained manpower.

The study framework can be used as a tool by library management, educators and facilitators to be more purposive about the Makerspaces they are initiating or working at. The framework is a reflection of the similar function performed by the academic and public library. This proposed framework could be a much-needed contribution to the gap in knowledge that exists in current Maker education literature. Work in this paper conceptualizes Makerspaces and provides considerations to realize their purported educational potential. The terms used in the framework are flexible, and the framework can be modified as the phenomenon of Makerspaces evolves and helps understand the phenomenon rather than predicting it. All three of these characteristics, flexibility, capacity for modification, and understanding are advantages of a good conceptual framework (Jabareen, 2009).

RECOMMENDATION

Based on the findings, the following recommendations were made:

1. Academic and Public library should carry out awareness in the library for users concerning makerspace creation in the library.
2. Library should be a place that should allow more practical work by the students rather than been theoretical alone.
3. The academic and public library should provide funds for the library to create an environment promoting student skills by introduce new technologies and boost the library's image
4. The academic and public library should make models of successful makerspaces.
5. The academic and public library should organize workshop and training programs for the librarian to effectively manage inclusive makerspaces in the library.
6. Users should carefully and properly handled the technologies made available in the space provided.

REFERENCES

Ackermann, E. (2001). Piaget's constructivism, Papert's constructionism: What's the difference? *Constructivism: Uses and Perspectives in Education, 1/2,* 85-94. Retrieved from http://learning.media.mit.edu/content/publications/EA.Piaget%20_%20Papert.pdf

Aina, L. O. (2004). *Library and Information Science Text for Africa*. Ibadan: Third World Information Services.

Anderson, C. (2012). Makers: The New Industrial Revolution. London: Random House Business Books.

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

Bagley, C. (2012). What is a makerspace? Creativity in the library. *ALA TechSource*. Retrieved from http://www.alatechsource.org/blog/2012/12/what-is-a-makerspace-creativity-in-the-library.html

Barniskis, S. C. (2016). *Creating Space: The Impacts of Spatial Arrangements in Public Library Makerspaces*. Academic Press.

Branigan-Pipe, Z. (2017). *Making a Makerspace: The Tools*. The Spaces and the Theories.

Britton, L. (2012). A Fabulous Laboratory: The Makerspace at the Fayetteville Free Library. *Public Libraries*, *51*, 30–33.

Burke, J. (2015). *Making sense: Can makerspaces work in academic libraries?* Paper presented at ACRL 2015. Retrieved from http://www.ala.org/acrl/acrl/conferences/acrl2015/papers

Burke, J. (2015). Making Sense: Can Makerspaces Work in Academic Libraries? *Association of College & Research Libraries*, *35*, 497–504.

DeLaMare Science & Engineering Library. (2017). *Lending Technology*. Accessed January 30, 2017, http://guides.library.unr.edu/equipment-checkout/delamare

DeLaMare Science & Engineering Library. (2017). *Making Resources*. Accessed January 30, 2017, http://guides.library.unr.edu/making-resources

Dougherty, D. (2012). The maker movement. *Innovations: Technology, Governance, Globalization*, *7*(3), 11–14. doi:10.1162/INOV_a_00135

Educause. (2013). *7 Things you should know about … Makerspaces*. Retrieved from http://net.educause.edu/ir/library/pdf/ELI7095.pdf

Fleming, L. (2014). *If you let them build it, they will learn*. Retrieved from http://worlds-of-learning.com/2014/03/24/if-you-let-them-build-it-they-will-learn/

Georgsdottir, A. S., Lubart, T. I., & Getz, I. (2003). The role of flexibility in innovation. In L. V. Shavinina (Ed.), *The international handbook on innovation* (pp. 80–190). Amsterdam: Elsevier Science. doi:10.1016/B978-008044198-6/50013-9

Greenwalt, R. T. (2013). Embracing the Long Game. *Public Libraries*, *51*, 15–16.

Guskin, A. E. (1996). Facing the future. *Change*, *28*(4), 26–38. doi:10.1080/00091383.1996.9937759

Handa, T. S. (2015). *Role of Public Library in the Society and a future vision of ICT enabled rendering of its services with special context to India*. Academic Press.

Hatch, M. (2013). *The maker movement manifesto*. New York: McGraw-Hill.

Hussain, A., & Nisha, F. (2017). Awareness and Use of Library Makerspaces among Library Professionals in India: A Study. *DESIDOC Journal of Library and Information Technology*, *37*(2), 84–90. doi:10.14429/djlit.37.2.10989

Igafo-Te'o, J. D. (2002). Development experts say children suffer due to lack of unstructured fun. *Bridges4Kids.* Retrieved from http://www.bridges4kids.org/articles/2002/10-02/Post10-1-02.html

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

Jabareen, Y. (2009). Building a conceptual framework: Philosophy, definitions, and procedure. *International Journal of Qualitative Methods*, *8*(4), 49–62. doi:10.1177/160940690900800406

Jubb, M., & Green, R. (2007). *Researchers' use of academic libraries and their services*. Retrieved May 31, 2010 from http://www.rin.ac.uk/system/files/.../Researchers-libraries-services-report.pdf

Loertscher, D. V., Preddy, L., & Derry, B. (2013). Makerspaces in the school library, learning commons, and the uTEC maker model. *Teacher Librarian*, *41*(1), 48–51.

Marsh, J., Kumpulainen, K., Nisha, B., Velicu, A., Blum-Ross, A., Hyatt, D., … Thorsteinsson, G. (2017). *Makerspaces in the Early Years: A Literature Review.* University of Sheffield: MakEY Project.

Martin, L. L. (2015). The promise of the maker movement for education. *Journal of Pre-College Engineering Education Research*, *5*(1), 30–39. doi:10.7771/2157-9288.1099

Mississippi Department of Education. (n.d.). *Creating a School Library Makerspsce: Guide and Resources*. Author.

Moorefield-Lang, H. M. (2015). User agreements and makerspaces: A content analysis. *New Library World*, *116*(7/8), 358–368. doi:10.1108/NLW-12-2014-0144

Morin, B. (2013, May 2). *What is the maker movement and why should you care?* Retrieved from http://www.huffingtonpost.com/brit-morin/what-is-the-maker-movemen_b_3201977.html

Morin, B. (2013). *What is the maker movement and why should you care?* Retrieved from http://www.huffingtonpost.com/brit-morin/what-is-the-maker-movemen_b_3201977.html

München, S. K.G. (2001). The Public library service: IFLA/UNESCO guidelines for development. IFLA Publications.

Okpala, H.N. (2016). Making a makerspace case for academic libraries in Nigeria. *New Lib. World, 117*(9/10).

Papert, S. (1980). Mindstorms; children, computers, and powerful ideas. 1980. *Library Journal*, *105*, 1856.

Pereira, J. (n.d.). *Making a Makerspace: Planning and Building a Successful Makerspace*. Academic Press.

Pryor. (2014). Implementing a 3D Printing. Heather Michele Moorefield-Lang. Makers in the library: case studies of 3D printers and maker spaces in library settings. *Library Hi Tech, 32*(4), 583–593. doi:10.1108/LHT-06-2014-0056

Radniecki, T. & Klenke, C. (2017). Academic Library Makerspaces: Supporting New Literacies & Skills. *ACRL 2017*.

Rutkin, A. (2014, July 17). Books out, 3D printers in for reinvented US libraries. *New Scientist*. Retrieved from http://www.newscientist.com/article/mg22329784.000-books-out-3d-printers-in-for-reinvented-us-libraries.html?full=true#.U-0hlkgRb_s

Scott, H. (2012). Making the case for a public library makerspace. *Public Libraries Online*. Retrieved from http://publiclibrariesonline.org/2012/11/making-the-case-for-a-public-library-makerspace/

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

Slatter, D., & Howard, Z. (2013). A place to make, hack, and learn: Makerspaces in Australian public libraries. *The Australian Library Journal*, *62*(4), 21–30. doi:10.1080/00049670.2013.853335

Tashjian, K. (2014). *Learn about the makerspace movement*. Retrieved from http://allaccessri.org/2014/03/12/learn-about-the-makerspace-movement/

Ultanir, E. (2012). An epistemological glance at the learning in Dewey, Piaget, and Montessori. *International Journal of Instruction*, *5*(2), 195–212. Retrieved from https://eric.ed.gov/?id=ED533786

Wang, F., Wang, W., Wilson, S., & Ahmed, N. (2016). The state of library makerspaces. *International Journal of Librarianship*, *1*(1), 2–16. doi:10.23974/ijol.2016.vol1.1.12

Wong-Welch, J. & Keven. J, K. (2018). The ROI of Sustaining an Academic Library Makerspace. *CNI 2018 Spring*.

Yusuf, F., & Iwu, J. (2010). Use of academic library: A case study of Covenant University, Nigeria. *Chinese Librarianship: an International Electronic Journal*, *30*. Retrieved from http://www.iclc.us/cliej/cl30YI.pdf

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

Chapter 14
New Opportunities in Libraries: Open Access, Open Content, and Collection

Halimah Odunayo Amuda
Al-Hikmah University, Nigeria

Imelda Barong Edam-Agbor
University of Calabar, Nigeria

Muhammed Jamiyu Oladele
University of Ilorin, Nigeria

Colette Ogugua Onyebinama
Federal University of Technology, Nigeria

ABSTRACT

The emergence of open access is one of the most significant changes to the world of scholarly publications since the migration from print to digital publishing began. Reports of some authors have demonstrated how libraries across the membership are changing, in response to a need for new services and an increasingly diverse client group. In order to contribute to the existing knowledge in the area of open access movement in libraries, this chapter discusses how the 21st century library provides a service that can open access to knowledge for the growth and development of communities they serve by highlighting the concept of open access and open content, roles of libraries in open access initiative as well as library collection development and open access. This chapter also sheds light on legal and ethical issues in open access and the future of open access in libraries.

DOI: 10.4018/978-1-5225-9034-7.ch014

Copyright © 2020, IGI Global. Copying or distributing in print or electronic forms without written permission of IGI Global is prohibited.

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

INTRODUCTION

Libraries across the globe are changing, in response to a need for innovative services and an increasingly diverse client group. A transformed higher education, which depends heavily on the internet to deliver lectures and to disseminate scholarly information, has presentedlibraries with many challenges. Libraries are saddled with the responsibilities of assisting their institutions to fulfill their specific missions of providing information to support teaching, learning and research. It is not a gain saying that progress of every academic discipline lies on the back of research and development. Research generates new information and knowledge. It is a standardized process of identifying problem, collecting data or evidence, tabulating data and its analysis, drawing inference and establishing new facts in the form of information (UNESCO 2015). Information has its life cycle: conception, generation, communication, evaluation and validation, use, impact and lastly a fuel for new ideas. Research results are published in journals, conference proceedings, monographs, dissertations, reports, and now the web provides many a new forum for its communication. Since their origin in the 17th century, the journals have remained very popular and important channels for dissemination of new ideas and research (UNESCO 2015). Journals have become inseparable organ of scholarship and research communication, and are a huge and wide industry. Their proliferation (with high mortality rate), high cost of production, cumbersome distribution, waiting time for authors to get published, and then more time in getting listed in indexing services, increasing subscription rates, and lastly archiving of back volumes have led to a serious problem known as "Serials Crisis". The ICT, especially the internet and the WWW, descended from the cyber space to solve all these problems over night in the new avatar of e-journals. Their inherent features and versatility have made them immensely popular. Then in the beginning of the 21st century emerged the Open Access (OA) (UNESCO 2015).

THE CONCEPTS OF OPEN ACCESS AND OPEN CONTENT

A large number of competing definitions of the term open access exist. The definition of open access has been put forth by many authors such as Peter Suber (2004) who defined the term as literature, which is digital, online, free of charge, and free of most copyright and licensing restrictions.

Open access is a way to provide free online journal articles to readers while supporting operations through financial models that permit this free electronic distribution. Because this is usually a paperless model (although hybrids exist), the turnaround is often much faster and cheaper than traditional publishing. However, some resources and funds are required for technical support as well as administrative costs, albeit less than those for a traditional print journal. Without these supports, an OA journal would not be able to support their website, peer and editorial reviews, sustainability, and growth (Daught, 2012, Williams-Jones et al., 2014).

OA business models are varied but usually available in two potential varieties: with a front-end fee or article-processing charge (APC) or no charge to authors. The APC model requires that once the article has been peer-reviewed and accepted for publication, the publisher's costs are paid by the authors or authors' research funder or institution. With the no charge to the authors model, the publishers fund their operations through sponsorship, advertising, voluntary labor, and/or by selling subscriptions for the printed form of the journal (Daught, 2012).

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

The OA fee-to-publish model has unfortunately resulted in an opportunity for so-called predatory journals that alter the OA model to exploit authors and enrich themselves (Beall, 2016, Murrell, 2016). These journals usually have a bogus editorial board, little or no scientific review, a complete lack of transparency, and little if any genuine ethical or publication guidelines. They fail to comply with publishing standards as set by the Committee on Publication Ethics, and their sole objective is to entice unaware authors to pay publication fees (Williams-Jones et al., 2014).

The Guru of Open Access Harnad (2008) has also described the characteristics of Open Access as information, which is Free, immediate, permanent, full-text, on-Line and accessible. Harnad suggests three main justifications of OA: "to maximise the uptake, usage, applications and impact of the research output of your university; to measure and reward the uptake, usage, applications and impact of the research output of your university (research metrics) and, to collect, manage and showcase a permanent record of the research output and impact of your university. Bethesda (2010) refined the definition of open access by stating that an open access work meets two criteria:

1. The author(s) and copyright holder(s) grant(s) to all users a free, irrevocable, worldwide, perpetual right of access to, and a license to copy, use, distribute, transmit and display the work publicly and to make and distribute derivative works, in any digital medium for any responsible purpose, subject to proper attribution of authorship, as well as the right to make small numbers of printed copies for their personal use.
2. A complete version of the work and all supplemental materials, including a copy of the permission as stated above, in a suitable standard electronic format is deposited immediately upon initial publication in at least one online repository that is supported by an academic institution, scholarly society, government agency, or other well-established organization that seeks to enable open access, unrestricted distribution, interoperability, and long-term archiving (for the biomedical sciences, PubMed Central is such a repository).

Lor (2007) outlined three reasons as to why open access is a significant option. The first factor as indicated by the author is the rise of the open access movement results from the convergence of an economic crisis, a moral crisis, and an enabling technology. The cancellation of journal subscriptions year after year is becoming the norm, and so are drastic cut backs on monograph purchases in order to maintain what is seen as essential journal titles. In developing countries, as pointed out by Lor (2007), the situation is catastrophic with many large universities in sub-Saharan Africa holding just a few hundred serial titles, many of them they receive free of charge. According to the author, the second factor is a twofold moral crisis. The first issue is the inability of researchers in developing countries to gain access to the world's science and scholarship. The continued reference to the "digital divide" is not restricted to the technology divide, but also a content or knowledge divide. The second issue is a growing sense that the relationship between authors, journal publishers and users is out of balance and unfair. There is a willingness by authors to submit their research free of charge and the willingness of editors and referees to peer-review the research also without a fee attached. Scholars publish their research in peer-reviewed journals for professional gain. The costs borne by the subscribers are generated through the publication and distribution processes. The third factor is the advent of the Internet. This digital technology is used both to control and to enhance access. Digital technology seems at first sight to offer significant cost savings by reducing set-up costs as well as marginal costs.

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

Open content on the other hand is defined by Kantrowitz (2012) as 'freely available for modification, use and redistribution under a license similar to those used by the open-source / free software community' Open Content is licensed in a manner that provides users with free and perpetual permission to engage in the 5R activities. The 5Rs are put forward on the OpenContent website as a framework for assessing the extent to which content is open:

1. **Retain**: The right to make, own, and control copies of the content (e.g., download, duplicate, store, and manage)
2. **Reuse**: The right to use the content in a wide range of ways (e.g., in a class, in a study group, on a website, in a video)
3. **Revise**: The right to adapt, adjust, modify, or alter the content itself (e.g., translate the content into another language)
4. **Remix**: The right to combine the original or revised content with other open content to create something new (e.g., incorporate the content into a mashup)
5. **Redistribute**: the right to share copies of the original content, your revisions, or your remixes with others (e.g., give a copy of the content to a friend)

In practice, open access are the literature that are freely accessible online. These are literature that scholars give to the world without expecting any form of payment. This category of literature comprises peer-reviewed journal articles and un-reviewed preprints that are put online for comment. Philosophy of open access is to provide free of charge and unobstructed access to research and its publications without copyright restrictions. With Open access system, articles are freely availability on the public internet; as such; users are permitted to read, download, copy, distribute, print, search, or link to the full texts of the articles.

EMERGENCE OF OPEN ACCESS IN LIBRARIES

The first ever formal open access repository launched was the arXiv.org in 1991 which help researcher in self-archiving of their electronic preprints of scientific papers in the field of physics, mathematics, computer science, quantitative finance, quantitative Biology and statistics (Das, 2015).As narrated by Jain (2012), Open access initiatives were taken by three groups; the Budapest Open Access Initiative (BOAI), Bethesda statement and Berlin Declaration., the Budapest Open Access Initiative (BOAI) took place in 2001, where the term "open access" was coined and the two strategies of Green OA (self-archiving) and Gold OA (open access publishing) were devised (Poynder, 2010).The "golden road" of OA journal publishing is where journals provide OA to their articles (either by charging the author-institution for refereeing/publishing outgoing articles instead of charging the user-institution for accessing incoming articles, or by simply making their online edition free for all. The "green road" of OA self-archiving is where authors provide OA to their own published articles, by making their own e-prints free for all. Open Access gained ground in 1994 when Stevan Harnad set fire in the academic and publishing world through The Subversive Proposal, which called authors to deposit their work on internet Fire Transfer Protocol (FTP) servers (Gideon, 2008). Open access emerged in a bid to address the problem of increasing

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

rapidly the cost of scholarly journal articles, which had made their access restrictive. Access to electronic journal articles is not free; the subscription fees will be paid by the subscribers before they could have access to the publication. Consequently, libraries stood between publishers and users. They have to pay subscriptions fees for these e-journals for their users to have access. Meanwhile, some of these publishing outlets have traditional monopoly of being the only publisher of some publications, as such; they increase the subscription fee at will. The rapid increase in the cost of subscription for these e-journals is a great challenge for libraries with limited or no fund most especially libraries in developing countries. This escalating cost of e-journals subscription has compelled libraries to look for another possibility of having unlimited access to e-journals without the burden of payment of outrageous fee for e-journal subscription. This development led to the emergence of open access, a new model for dissemination of knowledge at little or no cost in libraries.

As discussed above, open access is free for users of scholarly articles, but its' production is not free. It is assumed that its' cost of production is much lower compare to the cost of producing traditional print literature, as such, libraries can leverage on the growth of open access in developing their collections. However, for successful implementation of open access projects in libraries, some operational models should be considered by libraries. The characteristics of the operational models that may help the libraries to understand the practice of open access will be discussed in the next paragraph.

Author-Pays Model

The Author-pays model refers to the operational model in which publication is paid for by the author, the author's institution or research program (Xuemao&Chang2006; Wellcome, 2004). The traditional print publication applies the "subscriber-pays" model, "in which journals are paid for by readers, libraries, and similar institutions (Wellcome Trust, 2004).

The author-pay model reflects the shift in the cost of publishing from the reader to the author. Ideally, it is the authors' funding body that is supposed to cover the costs on behalf the authors. Some author-pays journals waive fees in cases of author financial hardship. Schroter and Tite (2006) argued that the author-pay model is risky and disliked by publishers because there may be possibility of reduction in the quality of journals. Burchardt (2014) corroborated this by stating that author-pay model has a type of built-in system failure that prevents research from being published if researchers or their institutions cannot afford to pay.

External Funding

Seeking financial support from external resources is another open access operational model. Significant amount of fund can be provided by external financial resources to cover the cost that occurred in developing a large-scale open access project, without putting financial burdens on authors and users of the resources. Xuemao and Chang (2006) reported that although the quality and services of open access will not compromised. However, the availability of external financial resources is limited and additional efforts to apply for the grants and raise funds are required. The other concern is the sustainability of external resources. Often the grants are time designated, such three-year or five-year. Some may be reapplied and renewed. However, there is no definite answer for the future (Xuemao & Chang (2006).

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

Fee-Based Support

The fee-based support model refers to the open access publishers fund the open access projects via additional services or products for sale online including advertising, e-commerce, off-line media, and software and so on (Xuemao & Chang, 2006). This model leverages on the media and technological resources to generate revenues to support open access project. Well-managed and subject related advertisement on the websites can be potentially useful for authors and readers. The fee-based support model makes use of the media and technological resources to generate revenues to support OA. Well-managed and subject related advertisement on the websites can be potentially useful for authors and readers. It can be a potential window to introduce the related industry to the academic and research community. The fee-based extra services can help to meet special needs of certain groups of users (Xuemao & Chang, 2006).

Voluntary Work

This model is similar to the model commonly used by non-for-profit organizations. No monetary reward is attached to this model. People with useful knowledge may willingly contribute to the open projects without expecting any form of financial gain in return.

Personal Websites

In this kind of model, author may choose to make available his/her publication on personal websites for free. (Xuemao & Chang, 2006; Bjork 2004) stated that this is the most common open access channel today. However, such a way for publication has its limitations. It is widely scattered on the Web. Only if the reader knows some direct information of the publication, otherwise, it is very difficult to search and locate it on the Web. Often the authors manage and organize their own publications and seldom assign appropriate metadata, therefore, there is no search tool designated to serve for such resources.

THE ROLE OF LIBRARIES IN OPEN ACCESS

A new technology and a new role have converged to make possible an unprecedented public good. The old tradition is the willingness of scientists and scholars to publish their research in scholarly journals without payment, for the sake of inquiry and knowledge and the new technology is the internet (Lor 2007). The beginning of shift from closed content to open access can already be seen at libraries across globe. Open access is of great benefit to libraries because it saves cost. For instance, if a traditional journal becomes fully open access or a new open access journal fully substitutes for a conventional one, that is one less journal the library has to buy, and it can deploy those collection development funds elsewhere. With this advantage, the probability that libraries, especially academic libraries, will ignore open access materials is quite low. The new role of the librarians in open access era is that of the publisher. This new role of publisher played by librarian removes the subscription issue to access literature which will in turn promote research and enrich education. Chadwell and Sutton (2014) buttressed this by stating that ‘Because libraries will be coordinating, dissemination and publishing activities for their home institutions, library faculty will assume roles such as digital publishing librarian, alt- metrics expert, publishing systems coordinator, data management and access coordinator, data visualization librarian,

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

and digital humanities coordinator. At the conclusion of a survey conducted by Lara(2014), respondents were given the opportunity to write openly about their thoughts on the library's role in encouraging and supporting an open access mandate on campus, the vast majority stated that "The library's role is in providing information and training to academic staff and briefing research meetings", The library should help researchers collect and promote their publications within institutional repositories, as well as help researchers understand the impact of their research across various channels (traditional + altmetrics)." "It obviously involves us, and we should be educating people to the current situation so that they have a better grasp for why alternatives are necessary. Beyond that, since we are part of the scholarly communication chain, it is partially our responsibility to inform people about what the results and details of the proposed or actual mandates are." "In general, libraries can serve education and advocacy efforts. Librarians can instruct faculty on advantages of publishing in OA journals, depository requirements for federally funded research, new research on cost-effective publishing, and legitimate OA publications as opposed to "predatory" journals, and new scholarly metrics that have arisen contemporaneously. ''The library should play a very prominent role if there was funding to do it and interest from top administration at the university. "The library should lead and drive the initiative." "The library should play the lead role in open access because it is a new field for libraries and their position at universities. In a 2010 presentation, Emmett, Stratton, Peterson, Church-Duran and Haricombe, (2011) listed specific ways that librarians are currently supporting open access practices and policies and advising faculty in their roles as instructors, authors, and publishers. These include; Assisting with rights and permissions; Maintaining scholarly communication Web sites; Organizing workshops on copyright issues and digital scholarship; Advocating through university governance and administrative channels, to shape discussions of open access policies; Educating and training other librarians and students.

Report of a survey carried out by Way (2010) in the United States also stated that the large library organizations should continue to stress an open access advocacy role for academic librarians because there has not been a large scale movement of individual librarians to change their own open access behavior (Way, D. (2010). This behavior might include self -archiving of their own post-prints or other scholarly works, choosing open access outlets for their own articles, by libraries changing expectations for promotion and tenure for librarians, or by open access behaviors by librarians in public services and collection development capacities

OPEN ACCESS COLLECTION POLICY STATEMENT

As a result of digital revolution, most libraries are now committed to the principle of open access. Many of them are following the IFLA Statement on Open Access to Scholarly Literature and Research Documentation. In most libraries nowadays, resources provided include open access and born-digital products to support the educational and research related goals of their parent institution. As part of the open access collection policy, some libraries provide support for members of the academic community who want to publish in open access formats. As eschewed by the Harvard University (2018) "the basic idea of OA is simple: Make research literature available online without price barriers and without most permission barriers." Scholarly articles provided to the university are stored, preserved, and made freely accessible in digital form ..in the institution's Library's open access repository. The repository has the institution of Harvard standing behind it to ensure its availability, longevity, and functionality.

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

University of Pennsylvania (2019) defined open access policy is a procedure used by some universities and funding agencies which requires that authors assign some rights (though not full copyright) of their scholarship to the university or funding agency which in turn can distribute it open access. Most of the policy is usually divided into two parts: (1) financial support for open access initiatives, and (2) identification and selection of open access content for addition to the collection and OPAC. Most of the open access collection policies reflect the following principles going by the explanation by the University of Pennsylvania (2019):

Everyone who conducts research at the in the institution is strongly encouraged to grant to the institution nonexclusive permission to make publicly available his or her scholarly articles for the purpose of open dissemination. Effective as of the date of endorsement by the Faculty Senate, faculty and other researchers will be invited, at their discretion, to grant to the institution a nonexclusive, irrevocable, paid-up, worldwide right and license to exercise any and all rights necessary under copyright to reproduce, distribute, display and otherwise disseminate, in any medium now known or hereinafter invented, each of his or her scholarly articles, provided that the scholarly articles are not sold or licensed by the University for compensation, and to authorize others to do the same on the same terms and with the same limitations. Faculty who do not submit articles for open dissemination are encouraged to notify the institution Libraries, through a process made simple and accessible by the institution. Authors are encouraged to seek the express, affirmative, written consent of all co-authors of a scholarly article before submitting the scholarly article to the Libraries for open dissemination; however, the institution may disseminate a scholarly article if all of the co-authors and co-owners of the copyright in the scholarly article who are members of the Standing Faculty, Standing Faculty or Research Faculty, grant nonexclusive permission to the institution, through an express, affirmative consent process to be developed.

The Faculty of the institution now endorses the principle of open access because they recognize the advantages of free access to new knowledge for the authors and the community. It is expected that, in most cases, faculty will choose open access as the best mechanism to rapidly and globally disseminate their work. In the light of this, the Faculty expects that the institution will provide sufficient resources to facilitate this process and sufficient information and expertise to accomplish the goals of open access with the minimum inconvenience and expense to the author(s).

Authors of the Submitted scholarly article are encouraged to make available a digital copy of the "final version" of the scholarly article, at no charge, to the institution's Libraries, in one or more standard formats (such as PDF) as the libraries may request, and no later than the date of publication of the scholarly article. If, however, the final version is already publicly available through other open access means (e.g., another open access repository or an open access journal), or if there is a legal obligation to make the scholarly article publicly available through other means, the submitting author(s) may provide a digital copy to the institution's Libraries. The "final version" means the author's manuscript with any changes made as a result of the peer-review process, but prior to any publisher's copy-editing or formatting. For articles and comments intended for publication in student-edited law reviews and journals, the "final version" is the version after all editing by the student journal editors, or its equivalent. The author(s) are strongly encouraged to notify the Penn Libraries of the location of and/or link to the scholarly article once it has been made public elsewhere. The institution Libraries will make the scholarly articles it receives available to the public in their digital common or institutional repository and/or a similar open-access repository or repositories.

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

Sometime when a faculty author requests an embargo, the institution's Libraries will have to embargo the scholarly article for the requested time period, before making it available to the public, except when (1) the author has a legal obligation to make the scholarly article publicly available within an earlier time period, the embargo should not exceed that earlier time period; or (2) the publisher of the publication within which such scholarly article appears makes such scholarly article freely available to the public for further reproduction or distribution, the embargo period should terminate. In any case, the requested embargo period should not exceed twelve months after acceptance of the scholarly article for publication.

In keeping with this Statement of Principles, the registrar and Libraries will develop and monitor an implementation plan and Web-based services to make faculty participation in open access and dissemination as convenient as possible. The common practice is to review the Statement of the Principles regularly to ensure its success.

LIBRARY COLLECTION DEVELOPMENT AND OPEN ACCESS

Collection development can be defined as the means through which high quality information materials of different formats (print and non-print) are provided by libraries in order to meet information needs of their users. Collection of books and other materials are historic features of libraries. Academic libraries have been involved in the collection of digital resources as well as printed volumes. The libraries have been involved in the management of collections and other services as well as tools that provide access to the collections. Building library collections traditionally entails provision of materials that serve immediate needs of the library users and storage of the materials for future generation of users. For these functions to materialize, libraries would have to acquire the collections and add them permanently. In order to ensure adequate coverage in a given subject, materials have to be added to the collection at the point of publication. In the last decade, access by the users to collections in the libraries has fundamentally changed. This was noticed when libraries moved from print to online provision of journal contents through subscription to title-level bundles of print and electronic journals. With the advent of established computerization, libraries became more comfortable with electronic journals (e-journals) and secured licensed digital perpetual-access rights such as JSTOR and other perpetual-access journal packages; the titles without perpetual-access rights were also expanded. Subscription to large aggregator packages substantially increased their journal collections. Nowadays, librarians were willing to cancel subscriptions to a print journal if they had perpetual access to the electronic version but would maintain dual subscriptions if electronic access was not perpetual (Michael Levi-Clark, 2014).

Recently, many libraries do not give concern about perpetual access since they can provide cheaper access to a version through an aggregator database. The early period of advent of e-journal resulted in some instability such as titles with perpetual access rights, but most with only temporary access; access-only aggregator packages; and smaller numbers of direct-subscription titles with perpetual-access rights. Lately however, libraries are have embraced only licensed access to most journal content because they can provide access to large volume of content at a far cheaper price than perpetual access. The most important aspect of this shift is that most academic libraries today provide access to far more titles than they did even a few decades ago at the expense of decreased long-term rights to that content, a trade-off that presents current users with much deeper and richer collections (Levin-Clark, 2014).

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

Libraries are now beginning to lease access to articles on a temporary basis through the use of some tools such as ReadCube and the Copyright Clearance Center's Get It Now service ReadCube (2014). At a time, these tools are being used to supplement subscriptions but have now gained acceptability as library budgets are cut and libraries' ability to maintain journal subscriptions fades off (Levine-Clarke, 2014). Other tools are DeepDyve, which provides consumers the ability to purchase articles directly, is a model that could also work for libraries in this regard. and SIPX, which is a tool designed to allow universities to manage copyright clearance for course packs and course reserves on an on-demand basis, provides an interesting model that might be adapted to enable broader access to content. SIPX is currently designed only for course-related content and triggers a relatively low copyright fee each time a student accesses an assigned article that is not part of a journal already licensed by the library (Levine-Clarke, 2014). Despite that SIPX was used as a service that will work with course reserves or to replace course packs, it has the potential to develop into a delivery mechanism on a much broader scale (Levine-Clarke, 2014). However, Get It Now and SIPX have been implicated as potentially eroding fair-use rights. Levin-Clark opined that if these sorts of services were expanded to provide access to article content at a much broader level, as part of the regular provision of research support, then the fair-use concern would become less relevant. As libraries move to this sort of model, it becomes less important to have access to the entire run of a journal and more important to provide powerful tools to help guide users and deliver content to them.

Development of libraries journal collections is a change in emphasis in regard to monographs.

There was decrease in the funding that libraries expended on books as journals became more expensive, and libraries subscribed to larger numbers of journal and article databases. As a percentage of overall materials budgets at university libraries within the Association of Research Libraries, for example, the median amount spent on monographs annually has decreased steadily from 41.4% in 1986 to 17.7% in 2011 (Martha and Morris, 2011).Journal subscriptions has greatly transformed to digital formats than Monograph acquisitions. Libraries began acquiring electronic books (e-books) in the middle to late 1990s, but until recently e-book acquisition provided only a small complement to the real business of buying print books. Historically, e-books have been regarded as secondary to print collections by many libraries. Recently, however, E-books are gaining acceptability and are being integrated into approval plans of many libraries where preference is being given to the e-book when it is available at the point of publication; also, libraries have extended the reach of their e-book collections.by employing subscriptions and demand-driven acquisition (DDA).The shift from print resources to e-books as the preferred monographic format is changing the orientation of some libraries about the long-term availability of books in their collections. Subscription to a package of e-books, by libraries, from an aggregator extends the chances of users to a large pool of titles that may or may not be available in the future. Employing both subscriptions and demand-driven acquisition (DDA) ascertain the libraries acquisition of broad collection of materials that will be available for future generations of users. Basically, this will afford the libraries privilege access over ownership of materials that will serve the interest of their future users. Some DDA programs are operated between purchasing a book early in the usage cycle or allowing usage for some time before purchase. The latter option allows a library to provide access to a larger collection. Within DDA, the choice about how many short-term loans to allow per title should force a library to think carefully about the nature of its collection. It should be possible to think about the DDA consideration pool as part of the collection, with books waiting for use being no different than already-purchased print titles sitting on the shelf (Levine-Clarke, 2014) . But because many books in a DDA pool have not yet been used, they are at risk of disappearing because of publisher and aggregator

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

business decisions. So far libraries have largely ignored this risk, as many have considered DDA to be only an adjunct to regular collection development.

Collection development will be the process of managing access to and delivery of a broad range of content through strong discovery systems. At the same time, libraries will reemphasize special collections, carefully building and curating collections in key areas of strength. These two strands will work together to provide users with the broadest and deepest collections possible.

Open access policy has been the conversation of many Academic librarians for many years. It was incumbent on Librarians that they must take part in the open access campaign and transform library practices to reflect new paradigms in scholarly communication. Librarians in the midst of the campaign may have considered the effects of total adoption of the principles of open access would have on the library itself, especially on daily work in public services and collection development. Librarians may be skeptical about the radical change and wondered about the job security of colleagues working in the library. Librarians may be eager to take action but have not been sure how to do so in roles that involve liaison work with faculty who have become entrenched in disciplinary traditions and cultures (Laura, 2011). Faculty members are toiling in an environment increasingly focused on assessment and accountability with a promotion and tenure bar that is set higher and higher. Librarians are also caught up in a whirlwind of increasing workloads and the changing priorities of institutions of higher education. Rather than setting out an overwhelming set of expectations, librarians may wish to examine all aspects of public services, collection development and technical services workflows to integrate open access practices in ways that will be welcomed by faculty, staff, students and the reading public (Laura, 2011).Librarians can take 'bold' steps to integrate the principles of open access into their daily professional work rather than perusing skepticisms of all sorts. Complete change may not be realized at a go, because many librarians may have become fatigued by strident rhetoric that does not speak to the goals and objectives of many excellent academic librarians. Challenges of change have to be embraced by individual libraries. Library and information science graduate programs can engage a new cadre of professionals in understanding the options that are available to every librarian that will likely play an integral part in the scholarly communication dialogue. Librarians working as liaisons in a subject specialty, in public services, technical services or any number of emerging roles will become professionals engaged in a rapidly changing scholarly communication landscape (Mullen, 2010). The learning curve may be steep for some, whether new or experienced, and it is the responsibility of libraries to ensure that, as the "intellectual heart of the university," the library promotes a deep and ongoing knowledge and dissemination of open access principles and practice (Mullen, 2010). Library practices can incorporate open access but only if library administration and library education make the appropriate transformation through adequate funding.

Since the acceptance of open access policy, new conversations present exciting opportunities for engagement by all academic librarians. The way forward seems paved with small experiments, Interesting collaborations of all types, and technical innovations that create opportunity to make Open access vision more a reality (Mullen, 2010).

COLLECTION DEVELOPMENT, OPEN ACCESS, AND PUBLIC SERVICES

Lack of focus on the academic librarians involved in collection development, liaison and public services work has marred the discussion on open access policy. The work of librarian at the technical sections is vital, but is not included in this particular analysis. Those in public services roles in the library, often

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

utilizing the collections built by other librarians are the "front line" librarians with great potential for outreach to the university community (Mullen, 2011). This ability for outreach allows public services librarians to weave a vital and dynamic conversation further out into the university and the public sphere. Those in research libraries may only recently have begun to struggle with providing access to the all of the scholarship that researchers need, and may want to reassess collection building practices to focus on a wider variety of scholarly materials, including those out on the web (Mullen, 2010)

Open access presents opportunities and challenges for extension of library collections and services (Mullen, 2011). For those libraries that have historically struggled with access, librarians are now able to add quality open access materials to collections and services. However, all librarians may be looking for practical strategies to maximize access to quality free web materials. Along with advocacy, librarians will need to integrate open access practices into everyday workflows if moving a stated agenda is to be realized (Mullen, 2010).Creaser (2010) describes research undertaken in higher education libraries in the UK, to investigate academic institutions' policies with regard to open access to research outputs and to assess the impact of open access publications on the library. A significant but alarming finding is that there is still considerable ignorance among researchers concerning open access publication of research outputs. However, for those that were aware of the possibility of publishing in open access forums, there was agreement that the library will pay the authors' submission fees. These payments are made to foster goodwill for the continued interest in publishing in open access forums. There is a silver lining and that is the increasing availability of research output on open access forums which has impacted positively on academic libraries in terms of their resource provision and on journal subscriptions. However, there were institutions who indicated that the availability of trusted researcher material available on open access platforms had positively affected their expenditure on journal subscriptions. Although the effect had not been to reduce expenditure overall, it had caused them to re-direct it: "we've not deliberately spent less on journal subscriptions, but it has probably helped us make more material available than we would otherwise have been able to afford" (Creaser 2010). The admittance to redirecting funds does very little to change the traditional paradigm. Librarians need to become creative and use funds saved in a quid pro quo manner, that is, the money saved should be invested in open access forums which will have a snow ball effect. The more information is made available in free and open forums the less pressure there is on the journals subscription budget. There should be a growing budget for open access costs and development. Budgets need to be developed for page fees, for publication processes and staffing to support open access. Funds should be allocated to marketing and educating researchers and users of open access content (Ellen, 2010).

LEGAL AND ETHICAL ISSUES IN OPEN ACCESS

Ethics refer to moral principles that govern a person's behaviour or the conducting of an activity. *Ethics* are a system of moral principles and a branch of philosophy which defines what is good for individuals and society. It is synonymous moral code, morals, morality, moral stand, moral principles, moral values, rights and wrongs, principles, ideals, creed, credo, ethos, rules of conduct, standards (of behaviour), virtues, dictates of conscience.

At its simplest, ethics is a system of moral principles. They affect how people make decisions and lead their lives. Ethics is concerned with what is good for individuals and society and is also described as moral philosophy (BBC, 2014). The term is derived from the Greek word *ethos* which can mean

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

custom, habit, character or disposition. Ethics covers the following dilemmas: how to live a good life, our rights and responsibilities, the language of right and wrong, moral decisions - what is good and bad?

The concepts of ethics have been derived from religions, philosophies and cultures. They infuse debates on topics like abortion, human rights and professional conduct of which the open access to information is part. The publication of an article in a peer-reviewed journal is an essential building block in the development of a coherent and respected network of knowledge. It is a direct reflection of the quality of work of the author and the institutions that support them. Peer-reviewed articles support and embody the scientific method. It is therefore important to agree upon standards of expected ethical behavior (Elsevier, 2019).

A practical and ethical case can be made in support of OA journals as a mechanism to ensure that manuscripts are made widely available and accessible to the widest audience of scholars worldwide as well as to interested members of the public (Willinsky & Alperin, 2011). First, publication in OA journals usually results in faster sharing of data than in traditional journals. This will ideally result in more rapid scientific progress and a reduction in duplication of scientific effort. Second, the lack of a subscription fee or fee to download an article will draw a larger audience (Parker, 2013, Watson, 2015, Williams-Jones et al., 2014). Third, research that is publically funded should be made freely available to the public who paid for it for reasons of accountability. OA publications inform and promote public discussion (Parker, 2013, Williams-Jones et al., 2014, Willinsky and Alperin, 2011). Fourth, commercial journals (and this can apply to both OA and traditional journals) have the potential to profit unfairly from the unpaid labor by academic researchers. Journal publication can be a potentially exploitative system that requires publicly funded academic researchers to submit their work to commercially for-profit journals. Academic researchers and clinicians willingly perform peer review and are members of editorial boards for no fee despite the fact that the publishing company often profits from the final product. In contrast to OA journals, some of these commercially produced, traditional journals have the power to place restrictions on who has access to the knowledge and who is the knowledge producer while making a profit (Parker, 2013). Obviously, OA journals by definition do not restrict who has access to the information that they publish. Fifth, the subscription-based system has the potential to narrow and control scholarships. Their need to brand and market themselves as well as their ability to restrict publication formats has the potential to alter the final product (Williams-Jones et al., 2014). Finally, the publishers of traditional journals require that authors sign over the copyright of the published articles to the publisher, arguing that they bear the cost of producing and making the article available. Therefore, it is only fair that control over the use of the article stays with the publisher so that they can recoup their costs (Watson, 2015).

In research that deal with people as participants, the ethics should involve around the research data may contain personal data – data that allows living individuals to be identified Legally, data protection, privacy legislation (data about living individuals) should be ensured; participants should be informed on how personal data will be used, stored,…. store securely, avoid disclosure and the need for the informed consent from participant to share such data. Ethically, research data may contain confidential information - information given in confidence, agreed to be kept confidential (secret) between two parties e.g. information on business, income, health, political opinion, legally there should be duty of confidentiality and ethically, do no harm

In terms of ethical obligations and data sharing, research with human participants usually requires ethical review (Research Ethics Committee), ethical conduct in research and protection of safety, rights and well-being of research participants – 'do no harm'; data archives such as ADP, UK Data Archive,… facilitate ethical re-use of research data, protection of participants and safeguarding of personal data

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

and data anonymisation and regulate data access. It should be noted that data sharing is NOT violation of data privacy or research ethics

The ethical arguments *for* archiving data should include the fact that researchers should not burden over-researched, vulnerable groups, make best use of hard-to-obtain data, e.g. elites, socially excluded, over-researched people, extend voices of participants, provide greater research transparency and enable fullest ethical use of rich data.

The best practice for legal compliance should involve investigate early which laws apply to your data, do not collect personal or sensitive data if not essential to your research. Seek advice from you research office, plan early in research. If you must deal with personal or sensitive data, inform participants about how their data will be used and remember: not all research data are personal (e.g. anonymised data are not personal)

The options for sharing research data that may contain confidential information involves obtaining informed consent for data sharing and preservation / curation, protect identities e.g. anonymisation, not collecting personal data and regulate access where needed (all or part of data) e.g. by group, use, time period. Ethics topics to consider when publishing (Elsevier, 2019):

- Authorship of the paper**:** Authorship should be limited to those who have made a significant contribution to the conception, design, execution, or interpretation of the reported study. Transparency about the contributions of authors is encouraged, for example in the form of a credit author statement.
- Originality and plagiarism**:** The authors should ensure that they have written entirely original works, and if the authors have used the work and/or words of others that this has been appropriately cited or quoted.
- Data access and retention**:** Authors may be asked to provide the raw data in connection with a paper for editorial review, and should be prepared to provide public access to such data.
- Multiple, redundant or concurrent publication**:** An author should not in general publish manuscripts describing essentially the same research in more than one journal or primary publication. Elsevier does not view the following uses of a work as prior publication: publication in the form of an abstract; publication as an academic thesis; publication as an electronic preprint. Note: some society-owned titles and journals that operate double-blind review have different policies on prior publication. Information on prior publication is included within each Elsevier journal's guide for authors.
- Acknowledgement of sources: Proper acknowledgment of the work of others must always be given.
- Disclosure and conflicts of interest**:** All submissions must include disclosure of all relationships that could be viewed as presenting a potential conflict of interest.
- Fundamental errors in published works**:** When an author discovers a significant error or inaccuracy in his/her own published work, it is the author's obligation to promptly notify the journal editor or publisher and cooperate with the editor to retract or correct the paper.
- Reporting standards**:** Authors of reports of original research should present an accurate account of the work performed as well as an objective discussion of its significance.
- Hazards and human or animal subjects**:** Statements of compliance are required if the work involves chemicals, procedures or equipment that has any unusual hazards inherent in their use, or if it involves the use of animal or human subjects.

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

- Use of patient images or case details: Studies on patients or volunteers require ethics committee approval and informed consent, which should be documented in the paper.

THE FUTURE OF OPEN ACCESS IN LIBRARIES

The future of academic libraries is open in more ways than one. The future for academic libraries is open in terms of being catalysts for Open Access (OA) to the scholarship created by our institutions' faculty members (Chadwell & Sutton, 2014). This vision for the future is predicated on our profession's track record of tremendous advocacy for opening up access to research outputs that are freely accessible online with full reuse rights. Our fundamental role in removing barriers to the free exchange of information is transforming the landscape of scholarly communication through building institutional repositories, publishing OA journals, hosting Open Educational Resources, facilitating access to research data, and advocating for the passage of OA policies. Many of these activities fall under the emerging field of library publishing, which will be a fundamental role for many academic libraries in an OA future.

A Springer 2017 study revealed that open access as the future of academic and scientific publishing. However, many are not satisfied with the speed of transition (Springer, 2017). The survey of 200 people aimed to gather opinions from people working in research institutions or research libraries, and who have responsibilities relating to scholarly communications, institutional policy, funding administration, or research data or publication management.

More than 70 per cent of respondents agreed that all future research articles, scholarly books and research data should be accessible via open access, with 91 per cent of responding librarians in agreement that 'open access is the future of academic and scientific publishing'.

Iowa University Library (2019) explained that the examples listed here comprise only a small sample of the innovations which have arisen in the fifteen years since the Budapest Open Access Initiative's Declaration first officially defined Open Access in 2002. Some of these "open" developments, like Open Monograph publishing, rose logically from the path that OA set out before them, but others, like the Open Science Movement, have arisen through the willpower of groups who are pushing the boundaries of what research can be and how it can be conducted. If these myriad tools, methods, and ideas can arise from what was originally a very small group of like-minded individuals seeking to make their research more accessible to the public, what comes next will surely be even more excellent. One cannot predict how these offshoots of the Open Access Movement will develop as time goes on, but it is certain that these ideas will continue to grow and change, and that more developments in the ways research can be conducted will evolve in the decades to come.

Many disciplines (e.g. Humanities) yet to fully benefit from electronic OA publishing because much output is in book form. Many scholarly monographs are overpriced and poorly distributed "At this price, people will only read the reviews", research libraries are increasingly looking to save money; one e-copy for multiple students and no lending administration overhead, no shelf space requirements.

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

OPEN ACCESS BOOK INITIATIVES

OAPEN/OAPEN-UK, Knowledge Unlatched, Directory of Open Access Books, Many smaller-scale initiatives e.g. Open Book Publishers, university press publishing Commercial Publishers also getting in on the act.

The future of OA will implies that Open Data movement going from strength to strength • Developing in parallel with Open Access, e,g, PLoS data deposit mandate. Open Data will largely be deposited in repositories, but publishers are now experimenting with "data journals"

In the future, there is the likelihood that Library as publisher and publishers becoming increasingly common (particularly in the US. Library Publishing Coalition, Regaining control of the publishing process (and costs), Student journals. Library generally oversees the Institutional Repository. Not such a huge leap to online publishing. Librarians already possess much of the knowledge required

CONCLUSION

There is no doubt that open access is a new paradigm for libraries and librarians. Library operation has shifted from print resources to e-resources. Thus, actualisation of open access to research publications will accelerate research, enrich education and afford the libraries privilege access over ownership of materials that will serve the interest of their future users.

REFERENCES

BBC. (2014). *Ethics: a general introduction.* Retrieved http://www.bbc.co.uk/ethics/introduction/intro_1.shtml

Bethesda. (2010). *Statement on Open Access Publishing*. Available at http://www.earlham.edu/~p eters/fos/bethesda.htm

Bjork, B. (2004). Open Access to scientific publications—an analysis of the barriers to change. *Information Research*, *9*(2), 3–14.

Burchardt, J. (2014). Researchers outside APC-financed open access: Implications for scholars without a paying institution. *SAGE Open*, *4*(4). doi:10.1177/2158244014551714

Chadwell, F. A., & Sutton, S. C. (2014). The future of open access and library publishing. *New Library World*, *115*(5/6), 225–236. doi:10.1108/NLW-05-2014-0049

Creaser, C. (2010). Open access to research outputs—institutional policies and researchers' views: results from two complementary surveys. *New Review of Academic Librarianship, 16*(1), 4 – 25. doi:10.1080/13614530903162854

Das, A. K. (2015). Open Access: History and Developments. In S. Mishra & M. P. Satija (Eds.), *Introduction to Open Access* (p. 17). Paris: UNESCO.

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

DeepDyve. (2014). *Read and Share from Thousands of the Top Scholarly Journals*. Available at http://www.deepdyve.com/

Ellen, R. T. (2010). *Open access: a new paradigm for libraries and a new role for librarians*. Retrieved from: http://www.kb.se/dokument/Aktuellt/utbildning/Ifla%20OA%202010/IFLA2010

Elsevier. (2019). *Policies and ethics*. Retrieved from http://www.bbc.co.uk/ethics/introduction/intro_1.shtml

Emmett, A., Stratton, J., Peterson, A. T., Church-Duran, J., & Haricombe, L. J. (2011). Toward open access: It takes a "village". *Journal of Library Administration*, *51*(5-6), 557–579. doi:10.1080/01930826.2011.589345

Eynden, V. V. D. (2015). *Legal and ethical issues: open access to data in research with people as participants. Research data management and open data. 23rd July, Social Science Data Archives*. Faculty of Social Sciences, University of Ljubljana.

Gideon, C. (2008). Open Access Initiative and the Developing World. *African Journal of Library Archives and Information Science*, *18*(2), 31–40.

Harnad, S. (2010). *Open access archivangelism*. Available: http://openaccess.eprints.org/

Harvard University. (2018). *Open access policy*. Retrieved from https://osc.hul.harvard.edu/policies/

Iowa State Library. (2017). *The Present and Future of Open Access*. Retrieved from https://www.lib.iastate.edu/news/present-and-future-open-access

Jain, P. (2012). Promoting Open Access to Research in Academic Libraries. *Library Philosophy and Practice, 737*. Retrieved from http://digitalcommons.unl.edu/libphilprac/737

Kantrowitz, M. (2012). *Tuition Inflation*. Available at http://www.finaid.org/calculators/tuition model

Lara, K. (2014). *Open Access Library Survey. An investigation of the role of libraries in open access funding and support within institutions*. Academic Press.

Levine-Clarke, M. (2014). Access to Everything: Building the Future Academic Library Collection. *portal*. *Libraries and the Academy*, *14*(3), 425–443. doi:10.1353/pla.2014.0015

Lor, P. (2007). *Libraries in times of open access*. Paper presented at the APE 2007: Academic Publishing in Europe Conference "Innovation & Publishing." 10.3233/ISU-2007-27411

Martha, K., & Shaneka, M. (Eds.). ARL Statistics 2008–2009. Washington, DC: Association of Research Libraries.

Mullen, L.B. (2010). *Open access and its practical impact on the work of academic librarians: Collection development, public services, and the library and information science literature.* Chandos Publishing.

Palmer, K. L., Dill, E., & Christie, C. (2009). Where there's a will there's a way?: Survey of academic librarian attitudes about open access. *College & Research Libraries*, 70. Retrieved from http://crl.acrl.org/content/70/4/315.full.pdf+html

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

Parker, M. (2013). The ethics of open access publishing. *BMC Medical Ethics*, *14*(1), 16. doi:10.1186/1472-6939-14-16 PMID:23521857

Poynder, R. (2010). Interview with Stevan Harnad: A prophet whose time has come. *Information Today, 27*(2). Available: http://www.infotoday.com/it/feb10/Poynder.shtml

Schroter, S., & Tite, L. (2006). Open Access publishing and author-pays business models: A survey of authors' knowledge and perceptions. *Journal of the Royal Society of Medicine*, *99*, 141–148. PMID:16508053

SIPX. (2014). *How SIPX Works*. Retrieved from: http://www.sipx.com/the-sipxsolution/ how-sipx-works/

Springer. (2018). *Open access is the future – Springer Nature survey*. Retrieved https://www.researchinformation.info/news/open-access-future-%E2%80%93-springer-nature-survey

Suber, P. A. (2004). *Very Brief Introduction to Open Access*. Retrieved from: http://legacy.earlham.edu/~peters/fos/brief.htm

University of Pennsylvania. (2019). *Open Access Resources: Open Access Policies*. Retrieved from https://guides.library.upenn.edu/oa/oapolicies

Watson, R. (2015). Ethics and open access. *Nursing Open*, *2*(2), 47–48. doi:10.1002/nop2.21 PMID:27708800

Way, D. (2010). The open access availability of library and information science literature. *College & Research Libraries, 71*(4). Retrieved from http://crl.acrl.org/content/71/4/302.f ull.pdf+html

Wellcome, T. (2004). *Cost and business models in scientific research publishing*. Available at http://www.wellcome.ac.uk/assets/wtd003184.pdf

Williams-Jones, B., Belisle Pipon, J. C., Smith, E., & Boulanger, R. (2014). *Ethical challenges of open-access publishing*. Retrieved from http://www.universityaffairs.ca/opinion/in-my- opinion/ethical-challenges-of-open-access-publishing/

Willinsky, J., & Alperin, J. P. (2011). The academic ethics of open access to research and scholarship. *Ethics and Education*, *6*(3), 217–223. doi:10.1080/17449642.2011.632716

Xuemao, W., & Chang. (2006). *World library and information congress*. 72nd IFLA general conference and council, Seoul, South Korea. Available at http://www.ifla.org/IV/ifla72/index.htm

KEY TERMS AND DEFINITIONS

New Opportunities: This is simple referred to as new potentials provided by open access to library uses.

Open Access: Open access (OA) is a mechanism by which research outputs are distributed online, free of cost or other barriers, and, in its most precise meaning, with the addition of an open license applied to promote reuse.

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

Open Collection: The term applies to copyrightable content that is made freely available and licensed according to permission for what are known as the *5R*activities: retain, reuse, revise, remix, and re-distribute.

Open Content: Open content is material, such as documents, images, and audio or video presentations that may be freely and legally reproduced, edited, excerpted, expanded, and republished.

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

Chapter 15
Exploring the Use of Social Media as Tools for Information Sharing Among Undergraduates of University of Ilorin

Abdulmumin Isah
University of Ilorin, Nigeria

Olubunmi Ruth Ogundele
University of Ilorin, Nigeria

ABSTRACT

The emergence of social media in the 21st century has revolutionized social interaction among individuals and groups beyond physical and geographical boundary. Social media tools such as Facebook, Whatsapp, Twitter, MySpace, Skype, Messengers, etc. have affected our traditional face-to-face interaction. It has facilitated extensive communication and sharing of knowledge in the society in general and schools in particular. In the academic field, social media serves as a powerful tool for communication. This chapter, therefore, explores the use of social media for sharing information among undergraduate students.

INTRODUCTION

The evolution of digital technology that brought about Social media has influenced the pattern of communication and interaction among individuals and groups in the present modern society. The traditional face-to-face interaction is gradually giving way to internet driven virtual discussion via various social media such as Facebook, Whatsapp, Twitter, MySpace, Skype, Messengers, etc. Social media has affected every facet of human society. It has changed how people, including university students, communicate, interact, and socialize over the course of their learning processes at educational institutions (Terzi, Bulut, & Kaya, 2019).

DOI: 10.4018/978-1-5225-9034-7.ch015

Copyright © 2020, IGI Global. Copying or distributing in print or electronic forms without written permission of IGI Global is prohibited.

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

The use of social media is not restricted to the working people but also there is a heavy increase in the use of social media by the students or education society (Raut and Patil, 2016). Its application has facilitated sharing of information; self-learning; teamwork; communication, both between students and between student-lecturer. University students now find it very easy to express their thoughts, ideas, and beliefs through various social media.

The concept of social media was coined officially by Tim O'Reilly and Dale Dougherty. Social media is a place where everyone can add or edit information. Over a decade, there has been an increasing interest in the new generation of web-based technologies, tools, and services offered by social media. This Social media, popularly known as Web 2.0 is becoming a central topic in our information world. Several authors have defined social media as a revolutionary arm of the web that enhances communication, collaboration, community building, participation, and sharing of information in an open social environment (Junco, Heibergert & Loken, 2011; Abdulsalam & Azizah, 2013).

Social media applications are commonly used by millions of people across the globe for different reasons (Al-rahmi et al., 2014). It is common in the present era to see people especially the students hooked on to different social media for keeping in touch with their peers. As noted by Adetimirin and John (2016:16) "social media has revolutionized undergraduates' communications as students hold brainstorming sessions, manage projects, share best practices and disseminate information without face to face encounters". One most important benefit of the advent of social media is the online sharing of knowledge and information among the different groups of people. This online sharing of information also promotes the increase in the communication skills among the people especially among the learners/ students of educational institutions.

The proponents of social media argue that contemporary students have become habituated to a world where social media is the norm; and have become an integral part of student social life. It has become an essential tool for students to interact and relate with their peers. Social media enriches the learning experience by allowing students and instructors to exchange ideas, foster collaboration and discussion, and engage and interact using such emerging social platforms (Lederer, 2012).

Social media tools are now seen as learning platforms or communities that could be utilized to enhance students engagement and performance. They are playing a vital role in content sharing among universities students (Hossain, Jahan, Fang, & Hoque, 2019). The fundamental advantage of using social media is the building of interpersonal relations through the creation of new connections (Abbas, Aman, Nurunnabi, & Bano, 2019).

The benefits of social media application in the education system cannot be overemphasized; however, much as the social media has contributed positively to the communication pattern of human society, especially among the students in institutions of learning, there are flip sides to the use of social media tools. Sometimes, such tools are misused by people which leads to interference into one's privacy. Such situations can lead to dangerous proportions keeping in view the ethical aspect of the use of such media. Eke, Omekwu and Odoh (2014) described some dangers associated with social networking sites such as E-crime, Internet addiction, laziness, a standard crime like fraud, murder, kidnapping; immoral act like pornography, prostitution, and cyber-bullying.

In spite of the tendencies for social media to be used for negative purposes, its adoption and usage continue to increase especially among students, because it enables users to communicate with each other, to create, revise and share new forms of textual, visual and audio content (Raut & Patil, 2016). It has been pointed out that it is no longer a waste of time for students to browse the internet or to use social

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

networks, as they are assimilating technological and communications competencies that are crucial in the contemporary world.

Statement of the Problem

The use of social media is now a global phenomenon and according to Hussain (2012), its usage and reliance by and among students are rapidly growing. It is now a common social gadget that has become part of the everyday life of human society. As noted by Global Digital Statistics (2017), there are 3.773 billion (50% of total population) people who are active Internet users with 2.789 billion (37% penetrations) people who are active social media users, whereas 2.549 billion of them access these social applications through their mobile devices (We are social, 2017).

Irrespective of the enormous advantages social media tools have had on every aspect of life in general, there is a dearth of research as to how students in Universities in Nigeria and the University of Ilorin, in particular, are harnessing social media tools for sharing information. It is on this basis that this study intends to find out the use of social media as tools for sharing information among undergraduates of the University of Ilorin.

Objective of the Study

The main objective of this research is to explore the use of social media as tools for information sharing among undergraduates of the University of Ilorin. The specific objectives of the study are to:

1. Identify the categories of social media use by undergraduate students of the University of Ilorin;
2. Examine the reasons for the use of social media by undergraduates of the University of Ilorin;
3. Ascertain the frequency of use of social media for information sharing among undergraduates of University of Ilorin;
4. Identify the benefits of using social media as tools for information sharing; and
5. Determine the challenges of using social media as tools for information sharing.

METHODOLOGY

The research design employed for the study was a descriptive survey design. The population of the study comprised 1,467 undergraduate students in the five departments: Library and Information Science (LIS), Computer Science (CSC), Information and Communication Science(ICS), Telecommunication Science(TCS) and Mass Communication (MASS COMM) that make-up the Faculty of Communication and Information Sciences of the University of Ilorin. 300 level students across the five departments were excluded from the study due to the fact that they were on mandatory industrial training at the time of the study. A pre-tested questionnaire was employed for data collection. Out of three hundred and fifteen (315) copies of the questionnaire administered to students of Faculty of Communication and Information Sciences of the University of Ilorin, three hundred (300) was returned, however, two hundred and ninety (290) copies of the returned questionnaire was found useful for the study. Therefore, given a 92% return rate.

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

RESULTS AND DISCUSSION

Demographic Data

Table 1 revealed that 62 (21.4%) of the respondents are from ICS Department, 48 (16.6%) are from TCS Department, 64 (22.1%) are from LIS Department, 55(19.0%) are from CSC Department, 61 (21.0%) are from MASS COMM Department. It was discovered that majority of the respondents 115(39.7%) were from 200Level, followed by 100 level with 88 (30.3%) and 400 level with 87 (30.0%). The table one also showed that 138 (47.6%) of the respondents were Male and 152 (52.4%) of the respondents were female. The composition of the respondents by age showed that 40.7% of the respondents were within 16-20years, 39.7% and 19.7% were within the age bracket of 21-25 and 26 and above respectively.

Table 2 showed that majority of respondents 285 (98.3%) have access to the internet and only 5 (1.7%) respondents claimed not to have access to internet. The table also showed that 64 (22.1%) respondents spend an average of 1 – 4hrs on the internet per week, 72 (24.8%) of them spend 5 – 8hrs on the internet per week, 69 (23.8%) of them spend 9 -12hrs on the internet per week, 30 (10.3%) of them spend 13 –

Table 1. Demographic Information of Respondents

Demographics		Frequency	Percentage
Department	ICS TCS LIS CSC MASS COMM	62 48 64 55 61	21.4% 16.6% 22.1% 19.0% 21.0%
Academic Level	100 200 400	88 115 87	30.3% 39.7% 30.0%
Sex	Male Female	138 152	47.6% 52.4%
Age	16 - 20 21 - 25 26 and above	118 115 57	40.7% 39.7% 19.7%

N = 290
Source: Field Work, 2018

Table 2. Internet access and usage time

Statements		Frequency	Percentage
Do you have access to the internet	No Yes	5 285	1.7% 98.3%
What is the average time you spend on the internet per week	None 1 - 4hrs 5 - 8hrs 9 - 12hrs 13 - 16hrs Over 17hrs	5 64 72 69 30 50	1.7% 22.1% 24.8% 23.8% 10.3% 17.2%

Source: Field Work, 2018

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

16hrs on the internet per week and 50 (17.2%) of them spend Over 17hrs on the internet per week while 5 (1.7%) of them do not spend time on the internet at all.

Table 3 showed that majority of the respondents 283 (97.6%) use Facebook followed by Whatsapp and Instagram with 260 (89.7%) and 242 (83.4%) respectively. ResearchGate is the least use social medial as indicated in the table 3.

Table 4 revealed that majority of respondents 270 (93.1%) indicated that they use social media for sharing information. Only 2 (0.7%) respondents disagreed. The study also revealed that148 (51.0%) respondents strongly agreed that they use social media to connect with friends and loved ones. Only 2 (0.7%) respondents disagreed. 142 (49.0%) respondents strongly agreed that they use social media to acquire knowledge and skills and share with others. In another dimension, 129 (44.5%) respondents strongly agreed that they use social media just to stay away from idleness. Only 3 (1.0%) respondents strongly disagreed.

The Table 5 showed that 124 (42.8%) respondents use social media very often to share information related to their assignments and only 9 (3.1%) respondents indicated that they have never use social media to share information related to their assignments. 116 (40.0%) respondents use social media very often for sharing information about lectures, lecture hours and lecture reminder, while 11 (3.8%) respondents indicated they have never use social media for sharing information about lectures. The findings also showed that 144 (49.7%) respondents use social media platforms very often for group discussion.

Table 3. Categories of social media use by undergraduates

Items	Yes	No
Facebook	283 (97.6%)	7 (2.4%)
Instagram	242 (83.4%)	48 (16.6%)
Whatsapp	260 (89.7%)	30 (10.3%)
RSS Syndication	153 (52.8%)	137 (47.2%)
YouTube	219 (75.5%)	71 (24.5%)
Bookmarks	165 (56.9%)	125 (43.1%)
Wikis	198 (68.3%)	92 (31.7%)
ResearchGate	159 (54.8%)	131 (45.2%)
Wordpress	186 (64.1%)	104 (35.9%)
Blogs	206 (71.0%)	84 (29.0%)

Source: Field Work, 2018

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

Table 4. Reasons for the use of social media

Statements	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
I use social media for information sharing	163 (56.2%)	107 (36.9%)	18 (6.2%)	2 (0.7%)	0 (0.0%)
I use social media to connect with friends and loved ones	148 (51.0%)	106 (36.6%)	34 (11.7%)	2 (0.7%)	0 (0.0%)
I use social media to read news	141 (48.6%)	89 (30.7%)	49 (16.9%)	11 (3.8%)	0 (0.0%)
I use social media just to stay away from idleness	129 (44.5%)	85 (29.3%)	53 (18.3%)	20 (6.9%)	3 (1.0%)
I use social media for obtaining research information	148 (51.0%)	94 (32.4%)	23 (7.9%)	22 (7.6%)	3 (1.0%)
I use social media for photo sharing	132 (45.5%)	113 (39.0%)	34 (11.7%)	11 (3.8%)	0 (0.0%)
I use social media for downloading and uploading files through the internet	151 (52.1%)	115 (39.7%)	22 (7.6%)	2 (0.7%)	0 (0.0%)
For reading and writing skills to communicate with other easily	136 (46.9%)	101 (34.8%)	44 (15.2%)	8 (2.8%)	1 (0.3%)
I use social media to acquire knowledge and skills to share with others	142 (49.0%)	101 (34.8%)	41 (14.1%)	4 (1.4%)	2 (0.7%)
I use social media for exchanging of ideas with other people	134 (46.2%)	100 (34.5%)	44 (15.2%)	12 (4.1%)	0 (0.0%)
I use social media for online learning	133 (45.9%)	98 (33.8%)	53 (18.3%)	6 (2.1%)	0 (0.0%)

Source: Field Work, 2018

Table 5. Frequency of use of social media for information sharing

Statements	Often	Very Often	Occasionally	Never
I use social media to share information related to my assignment	73 (25.2%)	124 (42.8%)	84 (29.0%)	9 (3.1%)
I use social media for sharing research information	70 (24.1%)	138 (47.6%)	71 (24.5%)	11 (3.8%)
I use social media for sharing information about lectures, lecture hours and lecture reminder	100 (34.5%)	116 (40.0%)	63 (21.7%)	11 (3.8%)
I use social media platforms for group discussion	61 (21.0%)	144 (49.7%)	75 (25.9%)	10 (3.4%)
I use social media platforms to share information about tests	88 (30.3%)	118 (40.7%)	75 (25.9%)	9 (3.1%)

Source: Field Work, 2018

Table 6 revealed that 272 (93.9%) respondents indicated that social media helped them to establish new friends. 153 (52.8%) respondents also indicated that social media helped them to disseminate reliable information to their friends with ease. The findings also revealed that 237(81.7%) respondents indicated that social media enabled them to obtain information about assignment given to then when they are outside the school premises.

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

Table 6. Benefits of using social media as tools for information sharing

Statement	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
It has helped me in establishing new friends	110 (37.9%)	162 (55.9%)	13 (4.5%)	4 (1.4%)	1 (0.3%)
It has helped me in disseminating reliable information to my friends with ease	100 (34.5%)	153 (52.8%)	36 (12.4%)	0 (0.0%)	1 (0.3%)
It has helped me to stay away from idleness	117 (40.3%)	133 (45.9%)	35 (12.1%)	3 (1.0%)	2 (0.7%)
I have been able to connect to students in related departments from other institutions	92 (31.7%)	126 (43.4%)	57 (19.7%)	12 (4.1%)	3 (1.0%)
I have been able to use it to obtain information about assignment given to us when I am out of school premises	121 (41.7%)	116 (40.0%)	36 (12.4%)	9 (3.1%)	8 (2.8%)
I have been able to find relevant information related to my research topic	98 (33.8%)	130 (44.8%)	48 (16.6%)	9 (3.1%)	5 (1.7%)
I have been able to download and upload files through the internet	115 (39.7%)	110 (37.9%)	42 (14.5%)	20 (6.9%)	3 (1.0%)
I have been able to connect with students with similar interest in social life	107 (36.9%)	125 (43.1%)	39 (13.4%)	16 (5.5%)	3 (1.0%)
I have been able to know date and time for social activities within the campus	125 (43.1%)	126 (43.4%)	26 (9.0%)	10 (3.4%)	3 (1.0%)
It has exposed me to the latest information in our society	116 (40.0%)	129 (44.5%)	32 (11.0%)	10 (3.4%)	3 (1.0%)
It has increased my self-esteem and well being	121 (41.7%)	106 (36.6%)	43 (14.8%)	16 (5.5%)	4 (1.4%)

Source: Field Work

Table 7 showed that 122 (42.1%) respondents indicated that social media encourages E-crime e.g. identity theft, theft or valuable data, interruption of business and financial loss. 145 (50.0%) respondents also agreed that social media caused internet addiction, while 129 (44.5%) respondents agreed that it has brought about laziness. The findings also showed that 100 (34.5%) respondents agreed that social media promotes immoral acts e.g. prostitution and pornography. Only 9 (3.1%) respondents strongly disagree. Affordability of the gadget required to use social media was also considered as one of the challenges of using social media.

DISCUSSION

There are many reasons for the use of social media by undergraduates. In the University of Ilorin especially in Faculty of Communication and Information Sciences, it was found out that majority of undergraduate students use social media for information sharing, to connect with friends and loved ones, to read the news, to acquire knowledge and skills to share with others and for online learning. The findings corroborated previous researchers in this research area (Lederer, 2012; Al-rahmi et al., 2014; Adetimirin & John 2016; Abbas et al., 2019).

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

Table 7. Challenges of using social media for information sharing

Statements	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
It encourages E-crime e.g. identity theft, theft or valuable data, interruption of business, financial loss	117 (40.3%)	122 (42.1%)	29 (10.0%)	18 (6.2%)	4 (1.4%)
It has caused internet addiction	86 (29.7%)	145 (50.0%)	27 (9.3%)	28 (9.7%)	4 (1.4%)
It has brought about laziness	82 (28.3%)	129 (44.5%)	50 (17.2%)	20 (6.9%)	9 (3.1%)
It has brought about social vices e.g. kidnapping, fraud, murder	76 (26.2%)	121 (41.7%)	41 (14.1%)	49 (16.9%)	3 (1.0%)
Immoral acts are promoted e.g. prostitution, pornography	92 (31.7%)	100 (34.5%)	50 (17.2%)	39 (13.4%)	9 (3.1%)
It gets addictive, taking too much time	87 (30.0%)	126 (43.4%)	26 (9.0%)	42 (14.5%)	9 (3.1%)
It encourages child abuse	92 (31.7%)	86 (29.7%)	46 (15.9%)	44 (15.2%)	22 (7.6%)
Cyber-bullying is encouraged	85 (29.3%)	101 (34.8%)	29 (10.0%)	60 (20.7%)	15 (5.2%)
Not everyone can afford it	90 (31.0%)	89 (30.7%)	34 (11.7%)	49 (16.9%)	28 (9.7%)

Source: Field Work, 2018

The study revealed that undergraduate students use different categories of social media which are Facebook, Instagram, Whatsapp, RSS syndication, YouTube, Bookmarks, Wikis, ResearchGate, etc. A few others were mentioned like Twitter, 2go, Skype, Eskimi, etc. This is in accordance with the findings Liu (2010) who investigated students' use of different social media tools and their attitudes and perceptions towards these tools. The study also revealed that undergraduate students derived some benefits from the usage of various social media. Such benefits include: establishing new friends, disseminating reliable information to friends with ease, staying away from idleness, etc. This corroborated the research of Raut and Patil (2016) that social media offers numerous opportunities.

Despite the aforementioned benefits, there are some serious risks to using social media in academics. This study revealed that students agreed to the fact that even though social media has its benefits, it still has its downside on information sharing because not everyone can afford it. Students are of the opinion that social media encourages electronic crimes, caused internet addiction and this has resulted in laziness. This finding corroborated Eke et al., (2014) study that identified some dangers associated with social networking sites. The majority agreed that social media has promoted immoral acts like students using social media to view pornography and it has brought about social vices like a fraud. Using social media very often causes addiction making students waste too much time on the internet and it encourages child abuse and cyber-bullying.

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

CONCLUSION

Undergraduate students in the present day use social media very extensively for information sharing. Social networks, discussion forums, blogs, wikis, and other technologies have become part of their daily activities. The students had positive attitudes regarding the use of social media for sharing information. Social media as tools for information sharing have helped students to navigate available educational information to complete tasks, develop vocabulary, and improve writing and reading skills.

RECOMMENDATIONS

Based on the findings drawn from this study, the researchers have made the following recommendations:

1. Students should be educated on the negative influence of social media on their academic performance.
2. Students should better manage their study time in and prevent distractions that can be provided by social media. There should be a decrease in the number of time spent by students when surfing the net in order to avoid internet addiction, laziness, social vices, child abuse, etc.
3. The benefits identified in this study should help students enhance their information sharing abilities through the use of social media instead of promoting a different kind of electronic crimes.
4. Students should create a balance between chit-chatting and academic activities. More attention should be directed to social media as tools for information sharing.
5. There should be a provision of laws on the content of social media i.e. there should be laws guiding the students' use of the social media sites and what they disseminate through the media.
6. The Government should provide enabling law that will enhance availability and access to facilities required to use social media and technology-driven equipment.

REFERENCES

Abbas, J., Aman, J., Nurunnabi, M., & Bano, S. (2019). The impact of social media on learning behavior for sustainable education: Evidence of students from selected Universities in Pakistan. *Sustainability*, *11*(6), 1683. doi:10.3390u11061683

Abdulsalam, K. A. & Azizah, A. R. (2013). Facebook in higher education: students' use and perceptions. *Advances in Information Sciences and Service Sciences*, *5*(15).

Adetimirin, A., & John, G. (2016). Use of social media for information dissemination by undergraduates in University of Ibadan, Nigeria. *Computer*, *4*(3), 12–20.

Al-rahmi, W. M., Othman, M. S., & Musa, M. A. (2014). The improvement of students' academic performance by using social media through collaborative learning in Malaysian higher education. *Asian Social Science*, *10*(8), 210.

Eke, H. N., Omekwu, C. O. & Odoh, J. N. (2014). The use of social networking sites among the undergraduate students of University of Nigeria, Nsukka. *Library Philosophy and Practice*, 1195.

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

Hossain, M., Jahan, N., Fang, Y., Hoque, S., & Hossain, M. (2019). Nexus of electronic word-of-mouth to social networking sites: A sustainable chatter of new digital social media. *Sustainability*, *11*(3), 759. doi:10.3390u11030759

Hussain, I. (2012). A study to evaluate the social media trends among university students. *Procedia: Social and Behavioral Sciences*, *64*, 639–645. doi:10.1016/j.sbspro.2012.11.075

Junco, R., Heiberger, G., & Loken, E. (2011). The effect of Twitter on college student engagement and grades. *Journal of Computer Assisted Learning*, *27*(2), 119–132. doi:10.1111/j.1365-2729.2010.00387.x

Lederer, K. (2012). Pros and cons of social media in the classroom. *Campus Technology*, *25*(5), 1–2.

Liu, Y. (2010). Social media tools as a learning resource. *Journal of Educational Technology Development and Exchange*, *3*(1), 101–114. doi:10.18785/jetde.0301.08

Raut, V., & Patil, P. (2016). Use of Social Media in Education: Positive and Negative impact on the students. *International Journal on Recent and Innovation Trends in Computing and Communication*, *4*(1), 281–285.

Terzi, B., Bulut, S., & Kaya, N. (2019). Factors affecting nursing and midwifery students' attitudes toward social media. *Nurse Education in Practice*, *35*, 141–149. doi:10.1016/j.nepr.2019.02.012 PMID:30825708

We Are Social. (2017). *Digital in 2017: Global overview*. Retrieved January 20th 2018 from https://wearesocial.com/special-reports/digital-in-2017-global-overview

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

Chapter 16
Looking Beyond Now in Publishing:
The Print vs. Digital Debate – What Should Be the Focus Content or Platform?

Ajani Yusuf Ayodeji
Independent Researcher, Nigeria

Adeyinka Tella
University of Ilorin, Nigeria

Shola Temitope Famuyiwa
University of Ilorin, Nigeria

Colette Ogugua Onyebinama
Federal University of Technology Owerri, Nigeria

ABSTRACT

Due to digital revolution there has been a lot of development in the publishing industry, and this has also affected access to and dissemination of information. The issue about print and digital debate is now common everywhere. However, the question about what the focus should be, whether the content or the platform, is still yet to be answered. While some believe that digital revolution will continue giving room for digital publishing to thrive; others are saying that it is not the platform that matters but rather the contents that should be made available to the users when needed. This chapter discusses the historical background of digital publishing, digital publishing initiatives, advantages and disadvantages of digital publishing, challenges associated with digital publishing, the print and the digital debate, and looks at what the future holds for publishing.

DOI: 10.4018/978-1-5225-9034-7.ch016

Copyright © 2020, IGI Global. Copying or distributing in print or electronic forms without written permission of IGI Global is prohibited.

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

INTRODUCTION

Publishing has become one important phenomenon in the world. This is because the world is surviving on information which books provide. There are many individuals, groups and organizations involved in the business of providing different information through books and other printed materials. Publishing is an interesting course that touches all facets of information processing, storage and dissemination especially literacy, formal and informal education. It is therefore significant to all librarianship exercises.

It could be difficult to cultivate a generally accepted definition for publishing; several scholars have developed generic concepts and terms for the process of producing literary works. Oso and Biobaku (2008) explain that publishing is a generic term used to describe the process of producing literacy and information materials for utility. Also, Nyeko (1999) opines that; publishing is "the process of producing for dissemination, books, films, computer programmes, records, newspapers, periodicals, discs, bulletins, magazines and other literacy materials." It is only when a manuscript has been transformed into a book and then distributed to its intended market place, that the process of publishing is complete. Lee (1979) defined publishing using its characteristics. According to him, there are three crucial components of book publishing. They are: book editing, book design, and book production. Contextually, we can conclude that book publishing is that process that seeks to capture social and intellectual activity and storing same for the information, education and entertainment of the society.

Okwilagwe (2001) quoted Chandler Grannis (1967) who define publishing as:

To make public – to send forth among the people – the words and pictures the creative minds have produced, that editors have worked over, and that printers have reproduced. Therefore, publishing is a process that involved creative minds who conceived ideas that want others to share. According to Okwilongwe (2001), Publishing is a process that consists of planning, selecting, editing, designing, producing, marketing and distribution of printed materials such as books, magazines and newspapers.

The demise of print has been famously predicted for years. In the early 1990s, Stakeholders of a major professional publisher announced that "print is dead." To this credit, it was publicly recanted that statement several years later. Despite the incredible advances in digital technology and new opportunities for selling e-products, print sales have remained the bread and butter of almost all publishers. Print, however, is not the solid foundation it used to be. In recent years, most sectors have seen an overall decline in print sales, and though we are likely to see some variations over time, the overall downward trend does not seem likely to be reversed.

In the past, publishers have been known to be too casual about the preservation of files. In many cases, publishers paid almost no attention to archival storage, instead depending on third-party typesetters and printers to maintain our intellectual property. Even now, some smaller and midsize publishers are guilty of such dangerous practices.

THE PRINT VS. DIGITAL DEBATE

Nowadays, consumers are exposed to digital media at least as much as print. The growing prevalence of smart phones and tablets, and the wireless networks that connect them, mean that more and more folks

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

will view media on a digital device. Of course, this also means more and more consumers will view advertisements on digital devices as well.

Zell (2013) opined that the rise in digital publishing, e-readers and tablets has also generated a blossoming of a huge number of African self-publishers, who previously were unable to reach a global market place without the intermediary of a publisher. Digital media now provides them with instant access to a wide international audience. Many authors who found their work rejected by mainstream publishers have gone ahead and self-published their books on e-book platforms, such as Amazon's Kindle, Kobo (who have recently launched in South Africa in partnership with Pick n' Pay hyper stores and supermarkets), Barnes and Noble's Nook, or Sony's Reader, as well as on e-reading apps for smart phones such as iPhone or iPad. John Mwazemba, the Chief Executive Officer of Oxford University Press East Africa acknowledges that in self-publishing you are in control of the content whereas in traditional publishing your work can end up very different from the original draft due to style changes, concerns about libel etc. Sometimes what comes out is not what you wanted to write. The flip side, he adds is that most people don't take self-published works very seriously. This is partly because of quality issues. The steps that a manuscript goes through in traditional publishing (editing, proof reading, copy editing etc) help to identify errors. Self-published books can have many mistakes and things like typos which tend to irritate readers.

Comparison of electronic and printed copies of the same publication reveals few, if any, differences. The structure and content is usually identical, with the same number of chapters and the same text. The main differences are in the formatting and the display of pictures and diagrams. Formats have largely evolved alongside the development of e-book readers. At the same time, application developers and publishers have employed different formats to operate on various platforms. From rudimentary ASCII to more advanced forms of HTML, PDF and EPUB, the increasing technical sophistication of e-books has produced an expanding range of formats.

HISTORY OF PUBLISHING AROUND THE WORLD

The concept of publishing began long before the invention of the printing press. It began as far back as the invention of writing stories and painting on cave walls, there comes Egyptians who invented (papyrus) story becomes transportable and knowledge began to be shared but it took a long time to write because the paper were drawn by hand Scribes copied works all by hand. Obviously, this was along, painstaking process, thus, books developed along with movable type.

The Invention of the Printing Press

The Chinese inventor Bi Sheng reportedly invented the first movable type with earthenware circa 1045, but it wasn't until Johannes Gutenberg invented his own movable type with metal around 1450 that printing really took off. It was at this point that books started to become more widely available. By printing books, the cost of production was reduced enormously and more books could be printed faster. This allowed the common citizen to afford books.

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

First Books

In 1455, *The Gutenberg Bible* was the first major book printed in Europe with movable type. It wasn't until 20 years later that the first book in English, *Recuyell of the Historyes of Troye,* was printed. Then in 1640, the *Bay Psalm Book* was the first book printed in the North American British Colonies.

THE CLASSIC MODEL OF PUBLISHING

Early Publishing Models: By the early 1800s, two publishing models had emerged. An author could sell the copyright and receive a one-time payment from the publisher for the rights to the book. Alternatively, the book could be published "on commission." In this model, the publisher would advance the cost of publishing the book and keep all of the profits until the cost had been recouped. After that, the publisher would keep 10 percent and the author would get the rest. If the sales did not recoup the cost of publishing, the author would be responsible for the cost.

The Inception of Traditional Publishing

Sometime in the next hundred years or so, these dual models faded and what we now think of as traditional publishing emerged. In some ways, the traditional model blends selling the copyright and publishing on commission. Many authors get an upfront payment for their book, and authors sign away their rights to the book. Additionally, publishers keep all profits until the cost of production (and the advance payment for the right to publish) has been recovered, and then they give the author royalties. However, the royalties are much lower, often between 10 and 20 percent.

THE MODERN MODEL OF PUBLISHING

The Introduction of Self-Publishing

With the creation of the world wide web in 1990, the world of self-publishing exploded. It was suddenly easy to type your book from a personal computer and send it to a printer. When Amazon launched in 1994, it became much easier to sell your book online. Simultaneously, the online program Story Space was released. It was a software for creating, editing, and reading. Michael Joyce's *afternoon, a story* was sold on floppy disks as a demonstration of the program. When CreateSpace, then called CustomFlix Labs, launched in 2002, it changed the game: it allowed authors to print and bind books like any other professional book on the market. In the years that have elapsed since then, the market has become flooded with self-published works. This a double-edged sword; authors who are unable to get a publishing contract are still able to get their works out to their readers, however they aren't taken as seriously.

The Birth of Hybrid Publishing

Most recently, hybrid publishing has become a new model for authors to consider when publishing. This new model gives authors the creative control of self-publishing and the creative and professional

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

expertise and distribution of traditional publishing. The payment distribution is reminiscent of the "on commission" model of the early 1800s. The publisher only takes a small cut of the royalties, but the author is responsible for the costs of production. Hybrid publishing is still coming into it's own, and has made great strides towards being seen as on par with traditional publishing in the last few years. In 2018, the Independent Book Publishers Association published a list of nine criteria to be considered a hybrid publisher. This gives the moniker legitimacy and establishes that the books are of quality and available widely. In 2019, traditional publishing, self-publishing, and hybrid publishing are the main paths for publishing for authors.

First Digital Publishing: 1982 – 1999

The first rumblings of the digital publishing revolution began making waves in the early 1980s with the growing adoption personal computers. At that point, internet access was still relatively sparse, so publishers initially distributed content on CD-ROMs.

In the 1990s, eBooks grew in popularity, and publishers began to create content in PDF and ePub formats for digital consumption. PDFs were easy to create—publishers just exported press-ready files they were already creating for their print magazines and books. ePub was a separate digital format derived from the Quark or InDesign compositor files.

One important thing to note is that, during this era, digital publishing started with design files built for print production and were then converted for digital use. The concept of digital-first publishing, with the exception of some early eZines, hadn't caught on yet.

These technological advances primed consumer for digital magazine consumption but hardware presented a problem. Desktop devices accounted for the bulk of PCs in the 1990s, and people only wanted to spend so much time chained to a desk. In order for digital publishing to really take off, tech manufacturers needed to come up with amore convenient platform for digital content.

Shifting the Print-First Paradigm: 2000 – Today

Post-Y2K, hardware advances began to happen at a rapid pace. In 2000, Microsoft launched their first line of Tablet PCs, and other manufacturers jumped on the tablet bandwagon immediately. In 2003, ePaper hit the market, and eReaders appeared shortly after, culminating in the release of the first Amazon Kindle in 2007.

The real kicker for digital publishing was the release of Apple's iPad in 2010. With the Apple brand behind tablets, consumers clamored to get their hands on one. And this huge spike in demand accelerated the shift from print-first to digital-first publishing.

The term digital-first publishing was coined by Andrew Miller of The Guardian in 2011 to describe a new content development approach. Rather than focusing on creating content for print and then translating that content for specific platforms, a digital-first approach considers the story in all of its variations during the ideation process. This approach allows content creators to explore the best way to convey their message for each specific medium, instead of shoehorning a piece of content built for a single medium into multiple formats.

Although most digital publishers have moved to a digital-first approach, that doesn't mean print publications have gone away. Even with the widespread adoption of tablets and eReaders, print circulation is still a ways from disappearing altogether. What it does mean is that publishers are investing more

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

resources into creating great digital assets as well as quality print pieces. They're also reallocating their budget to spend more on looking-forward digital content such as interactive articles and magazine.

DEVELOPMENT OF DIGITAL PUBLISHING

Clay (2012) claimed the history of e-books is disputed, though the start of Project Gutenberg in 1971 can be seen as the earliest beginnings of a collection of what we now know as e-books. The Sony Librié in 2004 was the first mainstream device to utilize electronic paper for e-books. Sony followed the Librié with other e-book readers and worked with publishers to ensure that consumers had access to online stores selling e-books. The vast majority of these e-books were popular titles and few academic texts. In 2007 there was a revolution in the use and delivery of e-books with Amazon's release of the Kindle in the United States. A different kind of e-book reader, Kindle was designed to work seamlessly with the Amazon Web site, allowing users to browse, buy and download e-books with this dedicated e-reader device. Along with a free lifetime 3G connection, the Kindle provided easy access to a large online book store without the need for a separate computer. A similar revolution occurred in 2010 with the release of Apple's iPad, which provided a device for accessing e-books using a variety of proprietary and Web-based apps. Apple released its own iBooks app and iBookstore to allow iPad users to buy and read e-books. In June 2012 Amazon went on to release a Kindle App for the iPad, allowing Kindle users to read their Kindle books on the iPad. This Kindle App also opened up the wealth of ebook content on the Amazon site to Windows, Mac, Android and iOS users. Alongside the growth of the e-book reader, publishers have been developing platforms for academic and public libraries, where collections of e-books can be accessed both on-site and off. These platforms enable users to read e-books and they can also allow users to copy and even print excerpts as well. With some platforms, books can be transferred to mobile devices or to dedicated e-book readers (Clay, 2012).

DIGITAL PUBLISHING INITIATIVES

There have been noticeable initiatives in some developing countries on bridging the so-called digital divide in the publishing industry. Zell (2013) describes selected initiatives below: The Worldreader project http://www.worldreader.org/, founded in 2008 by former Amazon senior executive David Risher (who headed Amazon's Kindle division) focused on bringing e-reading devices to classrooms in Africa, especially in three African countries, Ghana, Kenya and Uganda, with the aim of creating a new reading culture. Using these devices, it has reportedly brought over 200,000 e-books to children in these countries and which has included access, Worldreader reports, to about 500 African-published textbooks and story books (WGBLM, 2017). Worldreader says "using e- readers loaded with thousands of local and international e-books, we provide children with the books they want and need, so they can improve their lives." The Kindles used for the project can run for nearly a month on a single charge, and Worldreader says many of the students charge their Kindles at school, where power is usually available at least intermittently in the rural areas where it has distributed the devices. In Kenya, Worldreader partners with Longhorn Publishers. It provides schools, communities and partners with a list of textbooks and storybooks that are available in its programs. Based on their interests and needs, recipients then choose which books they want loaded onto the e-readers. Worldreader now plans to extend its activities into

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

Malawi and Tanzania. Most titles in African languages are now increasingly becoming available on the Worldreader platform, for example material in Hausa in Nigeria, Twi in Ghana, and in Kiswahili, Luo, Kikuyu, and Luganda for its programs in Eastern Africa. For the pilot project, participating Ghanaian publishers made content available for free in return for having their titles digitized and converted to e-Pub format. But when Worldreader subsequently realized the commercial potentials of the project, they negotiated contracts with the publishers, whereby Worldreader retains 30% of sales proceeds to cover some of their administrative costs, while the publisher is paid 70% in royalties, with regular sales reporting for all titles covered at this stage. One obvious question that arises is whether sales from e-books are likely to affect potential future sales of the corresponding print products. Interestingly, there are apparently no serious concerns about this. One of the participating publishers in the project, Woeli Dekutsey, believes that the activities of Worldreader in the digital area will actually complement rather than compete with, or erode local sales, for the print product; and that "the digital platform actually extends the market of our books, which first started their life as conventional paper-based creations." He further noted "my belief is that for us in Africa, the paper medium will coexist with the digital platform for a long time to come." One Laptop Per Child (OLPC) The mission of the Cambridge Massachusetts-based One Laptop per Child Foundation (OLPC) http://one.laptop.org/ is "to empower the world's poorest children through education". It aims to provide each child with a rugged, low-cost, low-power, connected laptop. To this end, it designed hardware, content and software for collaborative, enjoyable, and self-empowered learning. OLPC hope that by providing children around the world and especially those in developing countries, with these simple laptops they will open new opportunities to explore, experiment, and express themselves greatly. Their belief is that with access to this type of tool, children will become more engaged in their own education, and actively learn, share, and create together. The little green laptops are generally sold to governments and issued to children by schools on the basis of one laptop per child. OLPC receives financial support from a number of organizations, and funds are also raised through grassroots donation efforts. OLPC says that for a $199 donation it can give a laptop to a child in the developing world. The laptops have wireless broadband that, among other features, allows children to work as an ad-hoc network: each laptop can 'talk' to its nearest neighbor's, creating a local area network even if there may be no routers nearby. The laptops are designed to be highly power efficient, enabling the use of various power systems, conventional or solar power, generators, or wind or water power. The XO laptop is about the size of a textbook and lighter than a lunchbox. Thanks to its flexible design and inclusion of a transformer hinge mechanism, it can serve for standard laptop use, e-book reading, or playing games. OLPC says that over 2.4 million children and teachers in numerous parts of the developing world, and elsewhere, now have XO laptops. In Africa, there are currently XOs in ten African countries, the largest number in Ethiopia and Nigeria, with over with 6,000 distributed in each country. World Bank e-Book Pilot Initiative: Nalder (2011) reports about the World Bank's e-book pilot initiative in Nigeria (which could potentially be replicated in countries from Tanzania to the Philippines), which is looking at what it might take to deliver textbooks in digital formats for reading by secondary school students on dedicated e-readers, and what might happen as a result. Additionally, the project team was seeking to investigate the potential impact on educational achievement of making small libraries of digital books available to students on e-readers. Exampoa IT tool: According to CIO East Africa of April 21st 2016, Oxford University Press East Africa unveiled a new educational IT tool, Exampoa, which is an interactive learning and revision tool for Kenyan school pupils to use on phones and tablets, and then compare scores. James Ogolla, Sales and Marketing Manager Director at Oxford University Press East Africa says that the drive to make Kenya an ICT-enabled nation, and to drive

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

forward digital education, requires engaging content and first class educational materials on every kind of ICT platform, which has been a key factor in driving the development of the new tool.

ADVANTAGES AND DISADVANTAGES OF DIGITAL PUBLISHING

According to Bastek (2012), while the information available online is staggering, even in our technological age, we cannot forget to mention the fact that not everyone in this day is ready to sit down at a computer screen and read for any great deal of time. Curling up in front of the fire on a cold day with a book in hand can never be replaced by sitting in a cold chair staring at the words on computer screen. However, there are some obvious advantages of online publishing. Various mobile devices are able to read e-books, either as native e-book devices, or as an app on an existing device. The increase in technology ownership and the increasing popularity of mobile gadget means that many more learners have devices capable of reading e-books. Many of these devices have wifi or 3G and, as a result of this remote connectivity, it has become easier to access e-book platforms and collections whilst on the move (Clay, 2012).

Nalder, (2011) argued that education providers using mobile devices may now be able to:

1. Spend staff training time on improving pedagogy.
2. Spend valuable student lesson time on using technology instead of wasting time learning to use technology first and then the lessons.
3. Spend less money on supporting existing technology and more on supporting its use in classrooms.

Bastek (2012) discusses some of the merits and to some extent, demerits of online publishing below:

Costs

The costs of online desktop publishing are fairly low in consideration to those of print. The other positive about low costs for online publishing comes into play when distribution is considered. The distribution itself is free as well. There are no printing costs, which are usually print publishers' biggest expense, nor the waste of large amounts of paper that go along with printing. However, there are costs attached to some of the methods of marketing an online publication. Just because your publication is online, it does not mean anyone out there knows where it is or is reading it.

Profits

It remains difficult to make any money off of online publishing. Most publications online right now are free to readers and are merely charging for advertising space. However, some are attempting to require subscriptions.

Marketing

Although there are no or few distribution costs for online publishing, it does take a bit of marketing to get people to your site. You must register your publication with as many search engines as possible and, often, this entails a cost. However, if this isn't done, no one will be able to find your site. This process

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

needs to be given regular attention as your description or focus changes and as new search engines are introduced. Also, other sites that have agreed to link to yours need to be regularly contacted to make sure that link will remain on their site. So, while marketing and distribution might be cheaper for the online publication, it is not without its costs especially in terms of labor and time.

Editing

Editing is another plus involved in online publishing. For the most part, editing should and does occur before the new issue goes online. However, we've all come across several typos in print documents of any kind that weren't caught before the publication was sent off to the printer. In online publishing, there is no "final" product.

Time

An online publication also requires constant upkeep even in-between issues. Links need to be tested regularly in order to avoid 'linkrot'. And because editing can be done at any time, there's a responsibility attached to make sure what needs to be fixed is. Meanwhile, with print, once it is printed, it is out of your hands. In addition, deadlines for online publication are merely self-imposed. For print, the editors have to take into consideration that the printing itself takes a certain amount of time as does distribution. Therefore, their deadlines are fairly rigid. However, for online publishing, deadlines are good to get the ball going, but the actual publishing can occur at any time without the dependence on the time-frame of another. Audience: Audience is a category that can be considered both a pro and a con for online publishing. While your audience is not limited to only those hit in your distribution efforts, it is also not the dedicated group of readers that most print publications can count on (Bastek, 2012). So, while your publication may be more widely available, that doesn't mean that people are reading it. It is more difficult to determine your readership in online publications. First, you cannot know the demographics of your readers as easily as you might with print. Some people have attempted to stick with the subscription method to alleviate some of this problem, but then readership often goes down because readers can often get the same information elsewhere for free on the Internet. Counters help tell you how many have entered your site, but they cannot tell you if that person stayed long enough to read anything. While you might say the same of your subscribers in print publishing, the subscribers paid for your publication for a reason and are most likely continuing to read it as long as they're subscribed. Online, it's difficult to determine not just who your audience is, but how many readers you have.

Standards

Because online desktop publishing is a fairly new field, there are no set standards deemed a quality layout format. This can be seen as both a pro and a con. As an advantage, we can understand this to mean that there's more room for experimentation. However, as a disadvantage, there is been very little usability testing done on what readers like and dislike what keeps them there and what chases them away. So, while your content might be great, your layout could chase the readers away, and vice versa. It is still a volatile situation without any standards to rely on.

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

Submissions

Submissions are another tough area to tackle in online publishing. For example, from a literary journal standpoint, many authors are afraid to put their material online for fear of plagiarism as well as copyright problems that may arise later when attempting to publish their work elsewhere. Copyright laws for the Internet have not been firmly established yet, and because the Internet was created with the intention of sharing free information, they appear difficult not just to enact but to get users to abide by. Plagiarism, however, is a threat for publishing in any medium, print or otherwise. Authors seem to be slow to realize this. However, because of this wide-spread fear, many have deemed the work on the Internet to be poor and the authors published there to be unworthy of higher esteemed print publications. This stereotype also keeps submissions low.

Virality

According to the Huffington Post of October 2011, E-Publications benefit from virality because when you get something published online, it can be emailed, shared via social media, etc. With a little luck, it may go viral, resulting in many unique visitors for your unique work! The author adds that E-book sales and online journal subscribers are unlimited because of low overhead costs to the publishers. At the same time, Google searches pick you up as writer, which is important for people conducting searches in certain areas. When you publish online, you can receive almost instant feedback via email or comments. When you respond, you build relationships with readers that might bring enjoyment, friendships, new ideas, helpful tips, constructive criticism and loyalty to your future work; in addition readers can click to find your past work as well.

Other advantages The Director of Marketing Operations at Kiplinger Washington Editors, Greg Krehbiel adds the following advantages for digital publishing devices.

1. You can carry around hundreds of books in one device.
2. You can search the text of an eBook.
3. References in an eBook can link directly to the other information.
4. It is possible to include other media in an eBook, like sound and video.
5. eBooks do not clutter up your house, or the waste system.
6. You can read some eBooks in the dark. Providing e-books can improve access to content through the use of text-to-speech (TTS) functionality for those with a visual impairment. Likewise, reflowable text allows users to increase the size of the font without causing too many problems with how the text and structure of the page will appear on the screen (Clay, 2012).

PURPOSE OF PUBLISHING

Book writing serves many objectives. According to Oso, et al quotes in Tuchman (1980) as saying that without books, history is silent, literature dumb, science crippled, thought and speculation at a standstill. This declaration tells of the vital nature of books.

The objectives of book writing in this case, have been summarized into 5 classes:

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

To Announce

Book writing has achieved the function of communicating with these same people thereby bridging this diversity. Writers especially, novelists provide a lot of entertainment value to the reading audience.

To Expound/Explain

Many historical events are not the same as we have them today. This is because there was a time when certain knowledge was highly restricted. Book publishing has served the purpose of continuous re-evaluation of knowledge. Most writers evaluate previous positions and theories, and establish new ones.

Historical Reason

Book publishing serves as a reservoir of knowledge. It is what we write today that eventually becomes history. Africans have been found in the act of trying to re-write their own history.

To Transmit Knowledge or Teach

Scholarly knowledge always aims at transferring knowledge from one person to another. The book is the tool of the teacher to achieve this aim. Sometimes the book replaces the teacher.

- **Economic reasons:** The book publishing industry, especially in modern era, where society has become knowledge driven, has become a veritable source of wealth. In super literate societies, writers live off what they write. Many writers simply write wholly or partly to make money.

Challenges Associated Digital and Tradition Publishing

Zell (2013) pointed out that one significant e-commerce barrier is the issue of secure payment on on-line platforms, and sometimes also a lack of understanding and practice with these still relatively new methods of payment. The payment platforms and an absence of localized payment mechanisms for the payment of ebooks, as well as print books, remain a problem for many publishers, and there being able to access proceeds from sales locally rather than via overseas accounts, such as for payments via PayPal.

Additionally, some publishers are probably still not sufficiently conversant with encryption tools, digital assets and rights management, and the access control technologies and security systems that could assist them – albeit with some caveats – to control access to their digital content, and prevent unauthorized uses. Zell (2013), cautions that many self-published books are hugely flawed in their standards of writing, and hurriedly published without due care. When one purchases a book published conventionally by a publisher, one can reasonably expect that it would have been subject to some scrutiny, editing, re-writing, and proofreading, before it was released to the world. That is not the case with many self-published books, where the author alone has decided on its merits and invariably thinks all the world will want to read it. There is another, often overlooked, disadvantage in self-publishing and by-passing conventional publishers: self-published books in Africa, unless distributed through specialist Africana vendors or the African Books Collective, rarely get picked up by the major bibliographic and book information services which libraries all over the world use as selection tools to purchase new publications. As a result, many

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

self-published titles will probably escape the attention of African studies librarians, and so will not be acquired; nor will they get catalogued and subsequently appear in WorldCat, the world's largest network of library content, covering the collections more than 10,000 libraries worldwide.

Clay (2012), the main issue currently is one of compatibility: the variety of eBook formats available means that they cannot be read by all e-readers, or supported on all devices or platforms. Sometimes these limitations arise from technical reasons. Other limitations are generated directly by a decision of a publisher or company, which sometimes involves forcing users to choose a particular format or platform. It is not a simple process to convert different formats, and in some cases, it is technically impossible. Other challenges as noted by Clay, (2012), these include:

Cultural Resistance

In an academic culture that has used printed paper books for hundreds of years; the move towards the adoption of eBooks is a cultural challenge. Inevitably, users may show signs of cultural resistance and skepticism towards the use of eBooks. Some users may express a preference for printed books, ignoring some of the advantages offered by eBooks. As the JISC National eBooks Observatory Project (JISC Collections, 2009) found from its focus group research, in many cases the printed book is still the preferred format and this preference predominates for several reasons: the physicality of the printed book; a perception that a printed book facilitates greater concentration; belief that it is easier when reading to scan a printed book; and the expectation that a printed page is easier to annotate, highlight, and make notes from. In most cases, these reasons arise as a result of people thinking that using eBooks is about making a choice not to use a printed book.

Authentication and Distribution

Technical issues in adopting eBooks depend on the platform and types of eBooks in use. The main technical issue that institutions face revolves around authentication and compatibility. In addition, many of the advanced technical features of eBooks may not even be used or known by users.

Licensing Restrictions and Withdrawals

A range of licensing models cover eBooks and how they can be used in reading, lending, copying, printing and transferring to mobile devices or e-readers. Users may often confuse "personal" licensing with "educational" licensing. With traditional books, it is very easy to make and share copies using a photocopier. As might be expected, users often want to do similar things with eBooks. Different eBook licenses allow users to undertake different kinds of copying, but there is an inconsistency in how these licenses work and whether the copying is for personal use or for use with learners. Some eBook licenses allow readers to make PDF copies of part of a book, which can then be distributed to others. However, some licenses only permit users to make PDF copies for personal use. Copying an entire eBook and transferring it to a mobile device (or another computer) is another activity that may be prohibited by the eBook license. Some eBooks can be transferred via a central service. Other eBooks can be downloaded to users' computers and then copied and transferred to their mobile devices. Yonazi et al. (2012), the opportunities for ICTs in education must be understood within a context of challenges and difficulties. These include: the absence of comprehensive policies which enable and support interventions and which

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

are supported by clearly defined and resourced strategies for implementation at national level as well as at the level of educational institutions; lack of financing and prioritization of ICT investments; limited infrastructure of the kind required to support the use of ICT in education; lack of capacity at all levels to integrate and support the use of ICT in education effectively; lack of necessary ICT skills among teachers and of the specific training needed to be able to use ICT appropriately in the classroom; lack of appropriate content; lack of accurate, comprehensive, up to-date data on education; and the tendency of ICT to accentuate social, cultural and economic disparities.

According to Writersrelief.com of 2011, mixing up ditial and print is a smart business model: major and minor book publishers are releasing new titles as both digital and print works. Many e- journals have anthologized print editions, and many print journals have online editions. The author adds that as people who have made a life of being writer advocates, we feel that writers should have a good mix of online and print publications. Zell (2013) adds that the general consensus among some African publishers seems to be that digital and print formats will go hand in hand in the foreseeable future. Many observers also believe that, for the moment at least, the conventional book continues to have numerous practical advantages over the eBook, and that, as a format, the book remains flexible, accessible, and is still relatively cheap. The book is not going to become extinct and disappear from our lives and our book shelves any time soon; nor will digital devices ever be able to match the pleasurable experience of browsing in a good bookshop. Accessing eBooks may be easy and quick, but when you buy a book for download on your e-reader you might well bear in mind that you have not actually bought it; unlike when you buy a print copy, you do not own it. All you have done is to buy a license to read it on your Kindle or other e-reading device.

Furthermore, the conventional book requires very little support, unlike eBooks, which require electric power in some form or another. Acclaimed British writer Jeanette Winterson asserts that eBooks are not an improvement but an addition. They cannot be used as an excuse to take books away from the everyday world and into the virtual world. We all know that browsing an index is nothing like being in a bookshop or a library. Libraries and publishers will come to an arrangement about eBook lending and that could work very well as a satellite service for library users, providing we keep Planet Library. For kids, in particular, eBooks are not the answer. Put six picture books in front of a child and she will soon find her own way. Give her a library shelf of books and she can pull them out all over the floor. Jeanette concludes that early reading involves the taste, smell, weight of books.

Attwell (2013), describing himself as a "textbook publisher turned technologist", recounts his experiences, ultimately unsuccessful, of "trying to build fancy-tech products in South Africa", and his belief that for as long as "we think 'technology spreads' quickly, we'll be working on the wrong problems." He argues that contrary to popular belief, and if we cut through all the hype pronounced in press releases and news stories, technology actually spreads slowly. He tells of his involvement in founding an e-book production company set up to take advantage of fast moving e-book technology, and based on an expectation that the eBook wave was about to sweep through South Africa. "We waited and waited for the imminent eBook revolution", for four years, "but nothing happened". The project was eventually shut down. Attwell says he realized that he had been working on tomorrow's problems, but "hadn't tackled the problems people had today", and that today's problems can present real obstacles to new technology. That compelled them to face "the reality that for most people, new technology spreads slowly. Yet the myth that new technology spreads quickly is so entrenched in our thinking that it's almost impossible to escape. It's such a common assumption that we don't even question it." There is nothing wrong with

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

taking full advantage of impressive new technology, he says, but "we don't need fancy technology to help people read, to teach, or to save mothers and babies. We need a humble kind of problem solving."

Zell (2013), argued that African publishers' thinking should not be dominated by technology, nor should they be unduly alarmed about the sometimes near-hysterical debate about the dramatic change of the publishing landscape and the growth, or threat, of eBooks. They should continue to concentrate on content and quality, not on the platform. EBooks may well flourish in the years ahead, new technologies may well be transforming the lives of people, new products, gadgets, apps, and exciting innovations will continue to be launched almost every day and some will be enthusiastically embraced by readers all over the world, but traditional books, in Africa as elsewhere, will continue to have enduring qualities that digital formats can simply never replace.

Traditional challenges of publishing include but not limited to:

Challenges of Piracy

There are many pirates' issues in the area of publishing industry in Africa. Pirates actually reduce both the profit realized by the author and the publisher. Many pirates thrive in Nigeria using different methods and techniques. They take advantage of the weaknesses of the government in tracking down this menace to be a problem to the publishing industry in Nigeria. The activities of pirates have disrupted publishing of educational books and this has discouraged a lot of Nigerian authors from publishing more educational books for various institutions across the country. Piracy is a setback to publishing industry and the more government checks this menace, the more the art of publishing will be promoted.

Government Negligence

Government has not taken the necessary steps to promote the book publishing industry in Africa. The steps involve supporting both government-owned publishing companies and other publishing agencies in their quest to promote the art of publishing in Africa. The government can also set up agencies to check those who are messing up the publishing industry in Africa. One of the ways of promoting the educational sector in Africa is to promote the art of publishing since better books on education now have better chances of being published.

Poor Economy

The economy of Africa does not actually support the art of publishing. The poor economy of Africa has led many publishers to see publishing their work as waste of time and energy as they consider the fact that they do not make adequate profit by engaging in this activity. Also, many authors in Africa who wish to publish their books do not get enough incentives that can make them consider publishing their books as a reasonable option. The African economy actually has a negative impact on the art of publishing.

Promoting the African economy will surely promote publishing as both authors and publishers will now venture effectively into publishing. This will have positive impact on education in Africa. The Nigerian economy has also made a lot of foreign publishers not to invest in Nigeria. However, change in the Nigerian economy will definitely encourage foreign publishers to invest in Nigeria.

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

Substandard Production

It is no longer news that publishers have resorted to the use of low-grade materials (e.g., newsprint instead of high grammage wood-free paper) in book production while editorial and design proficiency have declined drastically due to inadequate training facilities. There are now many instances of books published in the country, even those produced by some of the major publishing houses, where pages are not straight and are smudged with large blobs of ink. Uneven print density and print images, barely legible halftones, poor finishing/binding and various other production flaws are now common in Africa. The majority of books produced in the country do not meet internationally acceptable standards in physical and visual quality, or in the quality of content (Ifaturoti, 1997).

Book Reading Culture

Atinmo (1998) traces the cultural and linguistics factors responsible for lack of reading for leisure among the neo-literates. She attributed the poor reading habits of such people to the entrenched oral forms of social communication, and noted that even such people wanted to read, it would be difficult for publishers to meet the reading materials needs of small populations whose local languages might not exist in written forms. Adegoke (2001), observed "that the majority of people who are literate hardly read for pleasure. Students for example, tend to read just to pass their examinations, many hardly read books outside their disciplines. Nigerian graduates of all levels are often not really information literate and /or sophisticated Okwilagwe (2001), disagrees with all the afore mentioned. He says, "Nigeria has a good reading culture and Nigerians buy books." he further buttressed that Nigerians are mostly utilitarian users of book.

Severe Infrastructural Problems

There was no stable electricity; From observations, the only surviving medium of electric power generation is generator. Power cuts are rampant in all urban centres in Africa, and several non-metropolitan areas lack electricity supply entirely. While examining the problems of Nigerian publishing with special focus on PHCN, NITEL, and NIPOST. Adesanoye (1995) has named the three as partners in inefficiency. African government promise to generate 10,000 megawatts of electricity by December 2015, is still an illusion for now and Nigerians still don't enjoy electricity supply. In 2009 several industries had to move out of the country to other neighboring countries for reasons bothering on this issue. Publishers are therefore are faced squarely with the high cost of running generators for its day to day activities.

LOOKING BEYOND NOW….

Diversity Will Continue to Be a Driving Economic Force in Publishing

Promotion of multicultural voices is going to be in the publishing world over the coming years. Case: In a Diversity Baseline Survey published back in 2015, the finding stated: "The publishing industry is white, straight, and physically able, and the vast majority of books published are intended for these audiences." The competition for readers has reached new dimensions and mediums. Another shift well underway in publishing is this: readers are accessing books in an ever-widening array of mediums.

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

Case: Vienna-based consultant Rüdiger Wischenbart recently shared data around how much time people generally spend accessing entertainment on their mobile devices. One group, comprised by more traditional readers—such as urbanites, the well-educated, and folks over 40—has seen their "mobile time" rise from a modest 26 minutes a day in 2012 to over one *hour* a day in 2017. The younger generation—let's call them 'Millennial Book Lovers'—spend almost three hours a day consuming content on their phone. This increase in leisure time is good news. The bad news for publishers and authors alike is how potential readers are spending their mobile time.

Consumers have a larger number of entertainment options at their disposal than ever before. And the data is increasingly suggesting that across demographics, people are not spending their time reading books (Steve Spatz, 2018). What authors need to understand is this: you're no longer just competing against other authors and books in the digital space. You're also competing with TV, social media, games, movies, other entertainment applications, and more.

Alternative media will drive tomorrow's best sellers

One adjustment to garner attention that authors might want to make? Turn their focus to alternative media. That's because the next big trend in publishing might just be alternative writing platforms, like Wattpad. Wattpad was launched 12 years ago and quickly turned into a fan fiction platform. Today, Wattpad might be the most important incubation ground for the authors of tomorrow. The Toronto-based business is now highly influential. In the last Six years, Wattpad has gone from 5 million unique users per month to over 65 million and now to 70million (Wattpad, 2019). The site now hosts over 550 million stories contributed by writers all over the globe.

Some publishers are currently tapping the potentials of Wattpad:

1. Simon & Schuster
2. HarperCollins
3. Macmillan

Notably, 90 percent of the average users of Wattpad are under 30. The platform is not only for teens but rather for the adult as well. For instance:

1. Beth Reekles wrote *The Kissing Booth*when she was a 15-year-old girl in Newport, CT, and published it on Wattpad.
2. Famed Canadian author Margaret Atwood has embraced Wattpad

Wattpad and other new technologies are a better way to reach today's generation of readers.

What's The Future of Publishing?

It's no secret that Amazon, eReaders, and tablets have been redefining the way we consume our content and causing massive disruptions in the publishing industry. However, while the trend of increased focus on digital publishing will continue, books like Harry Potter and more recently The Hunger Games or A Song of Ice and Fire (Game of Thrones), show us that print media is far from dead, it just needs some

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

accompaniment. To help gain a better understanding of the debate, group of industry experts were interviewed. Here's what they had to say…

Jain Karan Founder and CEO of Magfirst

With the transition into the digital world becoming more prominent by the day, the world of publishing has been affected by technology too. Traditional print publishing is slowly finding itself turning obsolete with the rise of digital book publishing. Soon, printed books will attain the status of collector's items for the visually interactive race that we are turning into. Digital publishing has already made a huge impact on publishing. With the entry of eBook readers like Amazon's Kindle, the digital transition of the publishing sector has been a lot smoother than expected. The growth of digital publishing has given authors the option of bringing out independent works with the help of big companies like Amazon, Apple and Google. Digitally, the world of publishing will soon bring reading, writing and literacy to the tips of everyone's fingers, giving people a chance to become their own publishers."

Tanya Hall, CEO of Greenleaf Book Group "In 10-15 years, the biggest change in book publishing will be the continued expansion of publishers' direct-to-consumer programs. Publishers continue to face a shifting retail landscape as Amazon takes increasing market share and bookstores evolve into "entertainment" stores with more non-book merchandise. Publishers will create value by curating exceptional genre content sold directly to the consumer. The next generation of book buyers will be brought up on series like Harry Potter and The Hunger Games and have a deep affection for books, both digital and print. They will continue to prove the cynics, who squawk about the inevitable death of print, to be dead wrong."

James Nuttall, Content Specialist for Dreambooth "When news desks that once had 20 members of staff are reduced to one full-time member, and some of the biggest national newspapers are ceasing to print physical copies and going totally online, it's tragic to state that the end can't be far away for traditional publishing. Print publishing may be extinct in 10 years, but this does not mean publishing is dead – far from it. SEO and quality content will become more important than ever thanks to digital publishing. As a result, this means that quality journalism and unique articles will be more vital than ever; search engines penalise lazy and sloppy content, branding it as spam, so for publishers to thrive in the ever-evolving world of digital content, they will need to provide content of only the very highest calibre. There will always be news. There will always be people wanting to be informed. Therefore, there will always be a need for people to write and publish content."

Jackie Graziano, Vice President, Marketing at MediaMax Network "The fate of publishing is still undetermined. Upon the rise of digital, folks jumped on the bandwagon and declared print media as dead. Well, guess what? I don't think print media will ever be dead. What I do think will happen (and is happening now) is that media properties will become brands. Not a magazine, not a website, not an application, but an experience, an influence, and a community. The media will continue to be accessible in many channels, allowing access at any time, any day. Brands and marketers will continue to align with these brand experiences to speak directly to the user, consumer, or decision maker. One thing I know for sure… publishers will need to remain focused on the content & experience and deliver value, not just another cool distribution channel. Brands that fail to do so, do so at their peril."

Kevin Dunn, Vice President Digital Media at MSP-C "The future of publishing in all its myriad forms is now and forever inextricably linked to continuing advancements in technology and delivery platforms. Enabling readers to curate and consume content when/where/how they want to is inexorable. Personalization will be paramount. That's the demand and the expectation right now. The instantaneous

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

fulfillment of any immediate need – reviews for the best sushi in Osaka, who played centerfield for the Mets in ’69 or an in-depth article on whether America is having a constitutional crisis is now how we roll. What of publishing two, five, 10 and yikes – 15 years from now? Weigh the consumer disappointment of the state of artificial intelligence today (Siri, Amazon Echo, Google Home, etc.). Our fervent wish is that it should be resolved in the very near future where unbridled technological expectations, limitless access and interests of the moment seamlessly provide informational immediacy and enrichment. The example is relevant when publishers consider the velocity and voracious demands consumers expect when interacting with content. Combine that with their accelerated desire for trusted, relevant, high-quality, vital content that is there to enrich their life. Publishing and publishers of all sizes, verticals and disciplines will be at the center of it all.”

Laura Hoffman, Marketing Executive at “Ten plus years into the future of broadband media publishing, content stories and the art of journalism will be intertwined with machine learning, automated technologies and personal mobile device technology. The matrix of possibility for researching, compiling, publishing and delivering content will lead to less of the direct human experience element and more of the encyclopedia mentality. But will end consumers even notice when they consume that article, video, podcast, etc.? Likely not.

Another potential future of publishing is that it moves away from mainstream standalone as an industry and breaks into smaller pieces to become a service department within companies under the umbrella of corporate communications or marketing communications. Publishing becomes a formal, standard department or resource spread across a company as part of corporate, beyond today’s more comment view of this as a strategy/tactic within marketing, currently referred to as Content Marketing.” “Audiobook sales are soaring - to the extent that some authors are forsaking print altogether” (Angelini, 2018).

CONCLUSION

The question of suitable local content remains a key issue, but one could argue that it is not really a matter of print or digital, but simply access to books (Zell, 2013). The important thing is to get books into the hands of readers in Africa, whether adults or children; regardless whether it is the traditional print product, or to get content onto smart phones and mobile devices, or on to e-reading platforms and tablets. We will need to remember that while access to books from indigenous African publishers, whether it is fiction or non-fiction, or children’s books and academic textbooks, can be said to have greatly improved over the last two decades, nowadays books in Africa have to compete with local newspapers, music and video sharing sites, online magazines, as well as a prolific output of home produced drama made for TV, or released by local movie industries. Subsequently, the now relatively easy availability of computers, the rapid growth of the Internet, widespread use of affordable mobile gadgets, together with the increasing popularity of social networks, have no doubt all played their part in creating what has become a diminishing reading culture in many developing countries. That is a worrying situation, which presents a huge challenge for Africa’s book professionals.

By the end of the day, for publishing to grow vigorously in Africa, in whatever formats, it requires a stable infrastructure, a stable and enlightened government to support it real progress; a government that takes positive steps to support literacy development, reading and writing, provision of library services, and support for its indigenous book industries (Zell, 2013). Annexing new and emerging technologies by authors, publishers and librarians to get the contents across to the various audiences should be the

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

target. This is because the era we are going into 'the internet of thing' is an era whereby everything related to contents and information will be dictated by technologies.

RECOMMENDATION

In view of all identified challenges and considering the prospects of book publishing in Nigeria, the following are recommended:

Introduction of Better Publishing Policies

Government should introduce better policies that will favor both the authors and publishers. Policies that will make things hard for the publishing industry to survive should be avoided. A lot of publishing industries have gone into extinction as a result of too much imposition of laws and orders made by the governments. Many companies have moved away from their location to other places and better countries as a result of high cost of taxation imposed on them.

Adopt New Technologies

Many of the established publishing houses in African publishers should turn to the new technologies on the internet for their publications. It is unwise to wait for nine to twelve months for a book to be published. This undue delay can lead many to self publishing since it is easy to publish on the web without delay.

Digital Publishing Should Be Encouraged

Digital publishing is now the new trend in the publishing industry and Africa ought not to be left out as the digital planet has a lot to offer the publishing sector if they are effectively utilized.

A lot of authors in Africa have also discovered that the digital planet offers them a lot of chances and opportunities to expand their publishing business and reach a wider audience. A book that is published in just a particular location has less outreach than a book published on the internet since the internet offers more outreach to more audience as the publisher is not limited much by geographical or location factors. Another benefit of digital publishing is its reduction on production costs.

The cost of publishing books manually is much compared to the cost of digital publishing of books, yet it comes with more audience outreach. Authors and publishers who find manual publishing too limited for them can venture into digital publishing as an option. This will also promote the publishing industry around the world. As more and more things are going digital, it is very necessary that the publishing industry gets the necessary adjustments. The digital planet offers the widest employment opportunity and digital publishing is surely a means of encouraging employment as these books can be published and sold online to anyone in any part of the globe.

Motivation of Private Publishers

Private publishers should be motivated. The government should not only sponsor government-owned publishing companies but also private publishing companies as doing this will promote the publishing

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

industry and also the educational sector. This will also encourage employment as more publishing companies will be encouraged to exist. The more the private publishing companies, the more employment opportunities are promoted.

Increasing Strategies to Checkmate Piracy

Book piracy in Africa need to be checked as this is downgrading the publishing industry. The government can introduced more methods that can track down book pirates. This is one of the methods of promoting the publishing industry. Methods which are tighter in checking book pirates should be encouraged by the indigenous government.

Infrastructural Development

Infrastructures should be developed to the level required to sustain the publishing houses. In the meantime, governments and policymakers in other countries should put in place an environment to enable their local book publishing industries recover from the recession.

Book Expositions and Reading Campaigns

There is high need to regularly organize book expositions and reading campaigns.

Governments should create favourable book publishing atmosphere which will impact meaningfully on book development. financial support should also be be given to publishers.

REFERENCES

Angelini, F. (2018, August 5). Culture. *The Sunday Times*.

Bastek, N. (2012). *Online Vs. Print Publishing. Writing@CSU.* Colorado State University. Available at http://writing.colostate.edu/guides/guide.cfm?guideid=37

Brenner, M. (2015). *Digital Publishing for the 21st Century*. Retrieved from https://www.ceros.com/originals/digital-publishing-for-the-21st-century/

Clay, J. (2012). *Preparing for Effective Adoption and Use of E-books in Education. Other. UKOLN*. University of Bath.

Collections, J. I. S. C. (2009). *National E-books Observatory Project: Key Findings and Recommendations (Final Report).* Retrieved from http://observatory.jisce-books.org/files/ 2011/08/JISC-national-e-books-observatoryproject-final-report.pdf

James, I. J. (2011). *Problems of the Book Publishing Industry in Nigeria: The Onibonje Publishers Experience after 50 Years*. Academic Press.

JISC TechDis. (2010b). *Towards Accessible e-Book Platforms (Report March 2010).* Retrieved from http://www.jisctechdis.ac.uk/techdis/resources/detail/goingdigital/

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

Nalder, J. (2011). *My Computing Journey: What the Post-PC Era Means for Education. Tablet Computers in Education. Exploring ICT and Learning in Developing Countries*. Retrieved from http://edutechdebate.org/tablet-computersin-education/what-the-post-pc-era-means-for-education/

Spatz, S. (2018). *The 3 Biggest Trends In Publishing Right Now*. Retrieved from https://writingcooperative.com/the-3-biggest-trends-in-publishing-right-now-c6008ffb889b

Yonazi, E. (2012). *The Transformational Use of Information and Communication Technologies in Africa*. The World Bank and the African Development Bank, with the support of the African Union.

Zell, H. M. (2013). *Print vs. electronic, and the 'digital revolution' in Africa*. Hans Zell Publishing, Retrieved from http://arthurattwell.com/2013/01/21/at-tedxaims-tech-spreads-slowly/#more-647 http://www.huffingtonpost.com/2011/08/10/digital-publishing-print-_n_923307.html[REMOVED HYPERLINK FIELD]

KEY TERMS AND DEFINITIONS

Debate: A process that involves formal discussion on a particular topic. In a debate, opposing arguments are put forward to argue for opposing viewpoints.

Digital: Refers to any online media available on electronic devices, including laptops and pads.

Digital Platform: Digital platform is any electronic tool for communication includes desktop, mobile, social and email software this covers websites and Social Media - Twitter, Amazon, Wattpad, etc.

Digital Publishing: Using online technology to digitize print material and disseminate it through electronic devices.

Prints: Prints is a reproduction of an original work of art (such as a painting) made by a photomechanical process.

Publishing: The act of communicating or making available a message or statement to the public by any means such as print, radio, television, and internet.

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

Chapter 17
Utilization of Smartphones for Retrieving Research Information Resources in Libraries by Undergraduates

Jane Igie Aba
Ambrose Alli University, Nigeria

Theresa Osasu Makinde
Ambrose Alli University, Nigeria

ABSTRACT

This chapter examined the utilization of smart phones for retrieving research information resources in libraries by undergraduates. The study covers awareness, utilization, benefits, effects, and constraints that affect smart phones for retrieving research information resources by undergraduates. These concepts generally implied that awareness facilitates interest for use. It was concluded that smartphones were used by undergraduate students to retrieve research information resources, and this had positive impact on research out of students will produce positive impact on academic performance of students. It was recommended among others that efforts should be made by the university to inculcate mobile teaching and learning curriculum in to the school syllabuses at the various levels, and library staff, lecturers, and university staff generally should be sensitized and trained in the use of mobile devices for teaching and learning.

INTRODUCTION

Smartphone is one the most popular communication devices in the world. It is a mobile phone running on a complete operating system in a manner similar to a traditional computer, which offer advanced computing abilities and connectivity options. These features enable new kinds of mobile services that in turn shape the usage habits of library users (Alfawareh & Jusoh, 2014). University library users are among the highest contributors to the increasing number of smartphone sales. The factor that most influ-

DOI: 10.4018/978-1-5225-9034-7.ch017

Copyright © 2020, IGI Global. Copying or distributing in print or electronic forms without written permission of IGI Global is prohibited.

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

ences the increase in smartphone usage is the functionality that helps users in their daily life especially business people and university library users (Jacob and Isaac 2008).

According to Wayne, Gregory & Joseph (2009) research is when information is gathered to answer a question that solves a problem. Creswell (2008) states that research is a process of steps used to collect and analyze information to increase the understanding of a topic or issue. It consists of three steps: pose a question, collect data to answer the question, and present an answer to the question. Thus, research is not just gathering of information or rearranging of paragraphs from an encyclopedia or web pages but asking real questions and finding solutions to them. In tertiary education, it is not only postgraduate students or the lecturers that carry out research. Undergraduates also engage in academic research (Kanelechi, Nwangwa, Ebun, and Omotere, 2014). Hence, undergraduate research is an inquiry or investigation conducted by an undergraduate that makes an original, intellectual, or creative contribution to the discipline (Wenzel, 2000). This definition makes room for creativity in undergraduate research. Creativity is the ability to transcend mainstream ideas, bringing about originality. It has been identified as the first necessary skill in research writing. Creativity is an essential trait that undergraduate researchers should seek to develop and utilize within their research experience in the library using available information resources (Adrienne, et al, 2013).

Saron (2005) affirms that undergraduate research are form of assessment designed by lecturers to test student skills in locating and organizing materials, comprehending a topic and/or applying a concept to a specific context (Sharon, 2005). This definition recognizes the art of critical ethical judgment in undergraduate research. The above descriptions of undergraduate research writing agree that First Degree research projects are designed with the intent of creating new knowledge. Undergraduate research writing empowers students to create knowledge as well as communicate their findings. The students' benefit from the research experience of the supervisors who builds confidence, offers encouragement, and provides guidance and assistance for the students' future education and career development (CPT, 2000).

HISTORICAL PERSPECTIVE OF SMARTPHONES

Historically, the first smartphones were released in the year 2000. It was manufactured by Ericsson and the model was called R380. This was the first time when this type of gadgets merged cell phone with computer functionality and was called a "smartphone". The popularity and range of smartphones has exploded in the last few years. Apple first introduced smartphones in mass consumer markets. The different between today`s smartphone and early smartphone is that early smartphones were predominantly meant for corporate users and used as enterprise devices and also those phones were too expensive for purely meant for enterprises. This era began with the advent of the very first smartphone Simon from IBM in 1993. Blackberry is considered as the revolutionary device, it introduced many features including email, internet, fax, web browsing and camera. This first phase of smartphone was based on targeting enterprises. The second phase of smartphone started with the advent of iPhone which was the major breakthrough smartphone market in 2007. In 2007, Google unveiled its Android operating system with the intention to approach the consumer smartphone market. In early 2013, smartphones overtook mobile phones by claiming a greater share of cellular device sales. This indicates a worldwide shift towards more accessible computing power held in the hands of individuals (Svensson, 2013).

Consequently, smartphones have replaced the use of desktop or mobile computers. Activities which can be performed on normal computers such as sharing information, sending and receiving emails,

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

chatting, opening and editing documents, can be kept inside a pocket of a trouser or a shirt. Some smartphones have sophisticated applications such as a camera which can work as a scanner. As smartphones provide more and more applications for wider range of usage, they have become an integrated part of people`s everyday life (Alfawareh & Jusoh, 2014). After a whole day`s working, people could check out their daily activity record on the phone, and they will have a clear picture of their physical activity performance during the day. (Zhang, 2012).

Smartphones have advanced features in addition to the standard functionality offered on a feature phone, such as the ability to send and receive text messages. They are equipped with the capabilities to display photos, play games, play videos, built-in camera, audio/video playback and recording, send/receive e-mail, built in apps for social websites and surf the web, wireless internet etc. In general, a smartphone has an operating system that allows a user to engage in activities that were once reserved for personal computer, such as accessing the web at higher speeds, viewing/editing documents, downloading files, creating music playlists, or managing multiple email/messaging accounts. Smartphone allows users not only to make and receive phone calls, text messages and voice messages but also a wide variety of other communications applications and multimedia. Smartphone is able to do a variety of functions such as increased overall productivity, make life more convenient, stay in touch with friends and family and solve complicated or time-consuming issues. Hossain (2014) gave a brief history of smartphones as follows:

1992: IBM Launch ‘Simon’

Simon was the nickname for the first phone launched which could do much more than make and receive calls and send texts. It was incredibly advanced for the time and offered amongst other things a calendar, world time, address book, notepad, email and even had a touchscreen.

1996: Nokia 9000

During the late 1990s, Nokia launched a range of phones aimed at business users. This range started with the hinged Nokia 9000, which was a cross between a phone and a PDA, and was quickly followed by the 9210, 9300 and 9500. The Nokia 9210 was one of the first phones to use an open operating system

1997: A Smartphone Is Born

The first handset to actually be called a smartphone was the strangely named *Penelope* from Ericsson. This was a concept phone and only around 200 units were ever made, but it paved the way for Ericsson to develop the R380 a few years later.

2000: Smartphone Is Sold

Ericsson‟s development of their concept phone *Penelope* led to the launch of the R380 in 2000, the first phone to be marketed as a smartphone. It featured both communication and PDA functions and used a clever touchscreen which could be covered by a hinged keyboard when it was being used to make calls. The R380 was the first commercially available smartphone to use the Symbian OS.

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

2002: Mobile Media Platform

The year 2002 was a busy year for smartphones and saw the release of the Palm Treo with its full query keyboard, the P800 from newly merged Sony Ericsson and the first ever Blackberry. The P800 added several new features to the smartphone market, including a MP3 player and a color touch screen. Blackberry concentrated on providing wireless email access, something it continues to do today.

2005: Smartphone or Multimedia PC

Sony Ericsson launches the N-series of smartphones in 2005. This series of phones were initially marketed as mobile multimedia computers. The N-series continued to improve and innovate year after year and has become a favorite of business people.

2007: Apple iPhone Hits the Stores

The much-hyped and subsequently much-loved **iPhone** hits the shops and sells by the bucket load. The Apple brand undoubtedly helps to sell the phone, but it is the success of the App Store in 2008 which keeps it ahead of the game. To date there are close to 200,000 commercial and free apps available to iPhone users, turning the iPhone into everything from an art studio to a spirit level.

2008: The Android Arrives

Developed as an open-source product and backed by Google, HTC, Intel and several other influential companies, Android was touted as the future for smartphone Operating Systems. The first phone to use this new OS was the HTC Dream (or T-Mobile G1 as it was also branded). Android is quickly becoming a favorite OS for smartphone manufacturers and it is thought that there are already 70,000+ apps available.

2009: Several companies launch their own app stores, including Nokia‟s Ovi Store, Windows Marketplace for Mobile and Blackberry App World. Android sees its market share grow from 3% at the start of 2009 to nearly 20%. It is a fairly quiet year for Apple, with iPhone fans waiting for the new iPhone 4 handset due out the following year. New versions of the iPhone 3 appear, including the 3GS. Many Apple fans object to the wallet-busting price tag for even a standard model.

2010: Apple announces reaching the 3 Billion download mark on its App Store and launches IOS 4 and the iPhone 4 which uses Api's to allow third party apps to multitask. The new iPhone sells in massive amounts but suffers something of a blip when it is discovered that gripping the metal frame too hard can make the signal drop. Android makes huge inroads into the smartphone market and grabs a 20% market share, largely thanks to the release of the Nexus One and some brilliant handsets from Samsung and HTC. Sales of all smartphones increase by 72% in 2010 and make up nearly 20% of all mobile phones sold.

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

CONCEPT OF SMART PHONES FOR LIBRARY SERVICES

There are lots of relevant and useful literature on conceptual definitions and descriptions of the concepts involved in this study. Smart phone is a term that encompasses cellular telephones with an integrated computer and other features not originally associated with telephones, such as an operating system, web browsing and the ability to run software applications (Rouse, 2013). Smart phones are mobile phone running on a complete operating system in a manner similar to a traditional computer, which offer advanced computing abilities and connectivity options. These features enable new kinds of mobile services that in turn shape the usage habits of smartphone users (Alfawareh & Jusoh, 2014). Smart phones have advanced features in addition to the standard functionality offered on a feature phone, such as the ability to send and receive text messages. They are equipped with the capabilities to display photos, play games, play videos, built-in camera, audio/video playback and recording, send/receive e-mail, built in apps for social websites and surf the web, wireless internet and much more. In general, a smartphone has an operating system that allows a user to do many of the things that were once reserved for a personal computer, such as accessing the web at higher speeds, viewing/editing documents, downloading files, creating music playlists, or managing multiple email/messaging accounts. The smart phone is used as means of interactions among people in which they create, share and exchange information and ideas in virtual communities and networks. (Blumstock & Eagle, 2010). Smart phones also use a group of internet-based applications that build on the ideological and technological foundations of web 2.0 that allows the creation and exchange user generated content. (Mayer & Mereno, 2003). According to Kohe and Wan (2014), there are Cellphone apps for various disciplines that improve academic performance oflibrary users. It improves decision making which also save time, allow fast access to current information, allow faster access to common reference resources and allow faster accesses to reliable source of knowledge.

Smartphones and Retrieval of Research Information Resources in Libraries

Smartphone offer users variety of services that are not possible with any other communication devices for the retrieval of research information resources in libraries. Hossain (2014) enumerated the services of Smartphone to include the following:

- Internet;
- email;
- Weather update;
- Support various apps;
- Self-camera;
- Easy to make a call;
- Easy to bear;
- Short message service;
- GPRS service or Google earth; and
- Video calling facilities.

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

The goal of smart phones will not be fully realized if students are not initially aware of the services and resources rendered. To effectively perform their duties, the operations of smart phones will largely depend on awareness and use of its resources by its users, otherwise, the resources and services will become old and irrelevant with time. Hence, the awareness of Cell/ smart phones are the most speedily emerging technologies in the human race (Robello, 2010). Studies have shown that awareness and use of smart phones have continued to grow astronomically. According to Hakoama& Hakoyama (2010), cellular/ smart phones have become very popular among youngsters' generation within a short span of time. Youth and students are more versatile in the techniques of smartphones, therefore making its used and access more interesting. Elogie, Ikenwe and Idubor 2015) stated that smartphones will allow students have immediate access to information, communication applications, ability to shop online, mobile banking and entertainment. John & Kritsons (2007) noted that some scholars have reservations about the use of smart phones by students/ youngsters. They believed that the use of smart phones by students at school could restrain them from their education and negatively affect their academic performance.

EMERGING INFORMATION TECHNOLOGY IN LIBRARY

Emerging technologies spring from a new technology or a new application of an existing technology. It is defined as science-based innovations that have the potentials to create a new industry or transform an existing one Myers, (2006). Emerging technologies has been applied by libraries for two reason. First, the libraries needs to meet the continuous demands for better services from their patrons Moore, (2006). Second, Second, the libraries see the use of innovative technologies as a better option in meeting those demands Kathryn, (2004). However, libraries have implemented emerging technologies successful Day and Shoemaker, (2000). The lack of success in implementing technologies could be attributed to a number of reasons. Emerging technologies pose new ethical issues (Moore, 2005) such as the privacy of patrons' data. In addition, library workers need to learn new roles Goestsch, (2008) such as shifting from the role of handling basic library transactions to serving the information need of the patrons. There is also uncertainty about the returns from the investment on the emerging technologies. As a result, the senior management will be very skepticism of these technologies will be even greater during the economic recessions (Davis, 2009). Despite those problems, libraries have continuously been deploying emerging technologies.

Emerging technologies in libraries provides librarians with a unique opportunity to substantially enhance user centered services and to promote collaboration between libraries and their users. Information technologies that have been used and has produced immeasurable advantages in enhancing services delivery in library include web blogs, wikis, podcast, web conferencing instant messaging etc. The role of library within, and the services it offers to, the community is rapidly changing with online resources and new technologies, libraries as created online communities, this has enhanced user services and provide independent access and unmediated to library services and collection. This emerging information technology allow the librarian to provide better services to users by offering simple as to what they want, when they want it, and how they want it. In an effort to provide access to and market the optimal 24/7 content and service delivery they are creating virtual communities through social software such as blogs, Rss feeds, Instant messaging, podcast, and web conferencing. Appreciating information technology in library services, Nwalo (2000) opined that librarians are duty bound to apply information technology in the 21st Century. Cockrane (1992) identified the following reasons for the introduction of ICT in libraries:

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

- The failure of the existing traditional methods to cope effectively with ever increasing volume in the library
- To allow for easy integration of various activities in the library.

The introduction of IT's to libraries could be seen as follows:

- To accumulate and increase work load
- To achieve a greater efficiency
- To introduce new services
- To benefit from co-operation and centralization

Information Technology applications in libraries have brought about effective and efficient service delivery in libraries and today it serves as the bases for most libraries operations.

Utilization of Smart Phones for Research

Utilization of smart phones is the extent to which smart phones are utilized in different formats to obtain vital information that will satisfy specific information needs of users (Makinde et al, 2017).

According to Emran,(2014) smartphone allows the users to not only make and receive phone calls, text messages, and voice messages, but also provide a wide variety of other communications forms as well as the ability to run productivity and convenience applications and enjoy multimedia. Consequently, smartphones provide variety of functions as a core simplified handheld computer device.. Smartphone can allow users to increase their overall productivity, make life more convenient, stay in touch with friends and family, or form a wide variety of functions that previously were complicated or time-consuming. Hanson *et. al*. (2011) asserted that the present generation has grown up in a technologically rich world, using mobile phones on chat rooms, electronic mails, computer games, and listening to music and watching TV and videos According to Tindell and Bohlander (2012) in an emergency, text messages can be sent directly to students' phones informing them of the source of the emergency and instructions on how to respond. Oksman, (2010) stressed that in addition to new media, the traditional media such as newspapers, radio and television are also made available on the smartphone through the Internet. Dean, (2010) found that students' experience and expectancy with their mobile library site, "searching for articles, reading electronic Books, checking out books, and contacting librarian or getting research help" were students' top future requests. It was further stressed that text messaging and e-mailing are two of the most commonly used functions on smartphones among college students, followed by reading news, watching videos and reading books. Post (2011) found that 99.8% of college students have cellphones which they claimed are essential to survive. Currently, most students used smartphone for texting and running apps and phones are rarely used to make phone calls. The number of college students using their cellphones during class has increased over the last few years. 80% of students admit to texting at least once in class (Jesse, 2013). Furthermore, smartphone social media apps give users the ability to check their social media sites anywhere, anytime instead of having to sit in front of their computer screen. Peterson (2011) stated that apps are a portable way to stay connected to social media and 97% of smartphone users use apps for social networking purposes. Cellphone apps have added new features to entice the mobile users as well, like location tagging and status updates. Many students will put exactly where they have been or where they're going on social media and then tag their friends. Although this

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

is scary and not practicing safety, features like these on apps are being used continually by many college students to show their social media friends exactly where they're going. Additionally, app usage of games is also widely accessed among the smartphone community. Laird (2012) conducted a study and reported that 55% of students use gaming apps either regularly or as a leisure activity on their smartphones. Cellphones are used while waiting in line at the coffee shop, searching various topics on Google, keeping track of homework assignments and staying connected to friends from school and friends at home. The increasing use of smartphones and apps affects students. Elder's (2013) studied college students self-reported cellphone usage and beliefs and investigated the effect on student learning and found that 85% of university faculty and students said cellphones were distracting and 45% noticed that vibrating phones in the classroom were problematic. The study described how cellphones have become capable of many more components than just phone calls and college students are now multitasking in classes by texting and listening to their lectures. Chen (2013) studied the educational versus non-educational app usage among college students and found that 58% of the college students used their mobile devices for academic purposes and freshman and sophomores tended to use their mobile devices for educational use. Baker's (2012) studied cellphone use and other electronic devices in the classroom and found that 45% of students reported spending more than 4 hours a day on their cellphone. EMarketer (2012) found that most smartphone owners use their apps for communication and social media. While, 21% of college students use their smartphones for communication and 19% use social networking apps with Facebook being the most commonly used.

Hossain and Ahmed (2016) explored the use and perceptions of smartphones among Dhaka University students for accessing academic information and found that students utilized their smartphones as a means to access academic information to record class notesand ther was positive perceptions towards smartphones as a tool for academic use. Bomhold (2013) studied the educational use of smartphones by university students that enrolled in Information Literacy course and found that the use of search engines was very low and apps was used to find academic information. Baker, Lusk and Neuhauser (2012) stated that faculty members should address the use of electronic devices in the classroom during lectures. According to Hanson, Drumheller, Mallard, McKee and Schlegel (2011) students in the library used email, instant messaging and web-surfing rather than checking the library's online resources. Although students want to make academics a priority, they have a difficult time balancing their school life with their need for financial and social support. It was found that students focus more on updating their Facebook status than downloading their homework assignments.

Benefits of Smartphones for Research

Mobile technology is the single most rapidly embraced technology in world history. Epstein (2013) enumerated the benefits of smart phone to include that cellphones are very convenient, easy to carry, and readily integrated into a user's routine and many people have their phone with them during all waking hours. Furthermore, a student with social anxiety could use a cellphone to practice a speech to their class by talking on their phone also app usage could possibly help improve completion of homework. Besides, text messages and texting helped students to complete homework, enhance therapeutic alliance, improve self-efficacy, and increase overall positive feelings about themselves. Elder's (2013) also studied students self-reported of cellphone usage, beliefs and the effect on student learning and found that university faculty and students were distracted by the use of cellphones and vibrating phones in the classroom were problematic. Tulane's (2010) found that the amount of text messages college students

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

send and receive range from 2 to 25,543 a month with an average of 1,960 texts. Furthermore, cellphone usage is changing how people act in public; texting is used to fill time and the individuals partaking in this do not think their actions are unacceptable. Although college student app usage is high, it is not necessarily a bad. Nahorniak (2012) found that professors and students created app for their finance class to allow them to experience what it is like trading on the floor; and the app was beneficial to the students. Thus,the app connected the theories and economic laws being taught in classes by putting students in a simulated situation, which allowed students to develop a better understanding of the workings of markets and the foundations of economic theory. eCycle (2012) stated that smartphones can help students create flash cards, make presentations, instantly get answers to questions, record films, record voice, and then send them to their computer. Furthermore, cellphones could be a good teaching tool to use in the classroom. The first example is the Dropbox app, students use the Dropbox App for file sharing within the classroom. Teachers can use Dropbox to distribute handouts quicker and use less paper helping teachers with another aspect of teaching. Dropbox also works on PC's. Therefore, when logged into your PC Dropbox account, the files on your phone Dropbox account can also be seen on your PC Dropbox account. A second example is Evernote, students can use this App to review their lecture notes after lectures. Finally, students can also use their cellphone camera to take pictures of the black/white board or to record lectures to be review later Valk, Rashid & Elder, (2010). Found that mobile phone-facilitated mobile Learning improved educational outcomes in the developing countries of Asia and m-Learning, the new learning facilitates, affords great opportunities for learners and mobiles can reduce barriers to educational

Effects of Smartphone for Research

The effects of smartphone on university students‟ learning are both positive and negative. Javid *et al.* (2011) enumerated positive and healthy impacts and effects of smartphone on students‟ performance at the university level to include the followings: contact easily with the teachers, classmates and parents; trace easily the teachers, classmates for the solution of educational problems; use internet to search out the useful information; use the smartphone as minicomputer; use dictionary and thesaurus; read news; listen FM radio for entertainment; and make photos and movies.

i. use Bluetooth infrared technology to transfer the data from smartphone to smartphone or to computer and computer to smartphone without any cost in few seconds. Data can also be transferred from other smartphone or computer that is 15 to 20 feet away and it is portable.

Jubien (2013), stated that smart phones are influencing and changing educational practices, for example, changes in the way information is gathered, receive instructions from teachers, do homework, collaborate with class mates, among others. Hingorani, *et a*l. (2012) stated that Cellphones can access social media sites, such as Facebook and Twitter in addition to the traditional use of calling and sending text messages. Universities also used cellular phones to advertise campus events and happenings, to promote the university brand among their students and to stay connected for a safer campus. Balakrishnan & Raj (2012) found that female students in Malaysia and Australia use their phones as a security device to contact others when they are in danger. John (n.d) submits that smartphones are popular among medical students for the applications that they offer. Students find it quite easier to communicate with people in a different way and also access different things with the features that smartphones support. Students enjoy a lot of benefits in various forms of their daily routine. They also get things done easily and quickly in

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

an efficient manner. Smartphones offer: better means of communication, learning options and users are exposure to the current information.

Hingorani's (2012) found how smartphones support students' lives and the issue of "nomophobia" (short for no-mobile-phone phobia) which is the fear of being without a mobile phone. Results showed that students do not use their phones for just texting and calling; but for social media, music, recording, gaming, etc. Students can multitask when using smartphones in the classroom and get connected without that connection their lives would be impacted negatively. Beaver (2010) found that students cannot go without their cellphones for two days as they will experience great distress.

Berger's (2013) found that students who use cellphones both within and outside class scored lower grades than their peers who use their phones less. Students who used cellphones more had lower grades and higher anxiety and were less happy than students who don't use their cellphone as often. Smith (2013) also confirmed that students who use their phone more had a lower GPA and higher anxiety. Smith's (2013) found that social network sometimes just makes me feel a little bit tied to my phone. It makes me feel like I have another obligation in my life that I have to stick with. Sometimes the cellphone just makes me feel like it is a whole new world of obligation that I have because anybody can get a hold of me anytime by just thinking about me. If my mom wanted to give me a call right now and just talk for a second, she could. And if I did not call her back by the end of the day, she would get worried. It creates a bit of anxiety and it is kind of annoying sometimes" and they depended on their phone, it gave them anxiety when they had to go without it for a certain period of time, and they felt obligated to have to carry their cellphone around at all times.

Martin (n.d.) found that cellphone usage affects student's concentration in class and the amount of information they actually receive with the distraction of cellphones. Cellphone usage in class affects their concentration and the information they receive, but they feel more comfort when they can check their cellphone and the two most commonly used cellphone features were to text and the clock to check the time. Weimer (2014) stated that students really cannot multitask and cellphones are a distraction in the classroom; "students who use their mobile phones during class lectures tend to write down less information, recall less information, and perform worse on a multiple-choice test than those students who abstain from using their mobile phones during class". Weimer (2014) also discussed how students think they can use their phone and do everyday tasks like eating, driving, etc., and it won't affect their performance of the second activity at all.

Users' Satisfaction and Service Quality in University Libraries

In University libraries, users' satisfaction depends on the extent to which expectations are matched by information services delivered. Library users expect that libraries should be equipped with good resources, skilled staff and consistent quality services. Users are described as the raison (reason for existence) of the library. Meeting the information needs of users requires the provision of the relevant information resources and services that will satisfy the needs of users. Technology and automation have changed the way users perceive libraries; emphasize is more on the provision of electronic library services than the mere physical library building and manual operations and services.

Farzana, Rehman and Khalid (2012) investigated users' perceptions about the library services. The survey was based on a questionnaire containing both open and close ended questions. The data were collected through mail, e-mail and personal visits. The analysis of the data about users' satisfaction with major library services shows that they were not fully satisfied with their respective library services. The

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

library users have also highlighted many problems, which they believed should be corrected. Supporting this, Kumar (2012) opined that users' satisfaction is an important measure of service quality in libraries. Users' perceptions about libraries seem to have been largely ignored by library management in developing countries. The assessment of service quality provides an important feedback for libraries to assess and improve its service to the users. Kumar's study examined the overall service quality of University libraries in Kerala from users' perspectives, and identified the dimensions that determine the customers' evaluation of service quality. The author administered structured questionnaire on a five-point Likert scale to measure respondents' satisfaction and perception of service quality using multi stage stratified random sampling. The quality of services was assessed through RATER analysis, based on the seventeen variables suggested by Parasuraman and Zeithaml in 1983. The researcher used adequacy of collection, physical facilities of the library, information products, and services of the library, behavior of the staff, functional organization of the library, electronic resources of the library and marketing activities of the library to determine the level of satisfaction of the users. The study found that the quality of services rendered by the University libraries is moderately good. The users of the University libraries in Kerala were largely satisfied with various aspects of service quality except responsiveness and are moderately satisfied with the physical facilities, collection, services, staff behavior, etc.

Mairaj and Naseer (2013) evaluated the satisfaction of users with the services of Punjab Institute of Cardiology (PIC) library in the Punjab province of Pakistan. A purposive sample of 15 health care professionals was selected. A semi structured interview technique based on an interview guide was used for collection of data. The data were qualitatively analyzed using a thematic approach. It was revealed that Users of PIC library were satisfied with the library collection, organization, reference and circulation services, staff attitudes, cooling and heating. They were concerned about library space, hours, furniture and environment, and suggested more availability of electronic library services, newer collections, better Internet access and comfortable furniture. Similarly, Adeniran (2011) examined the relationship between service quality and users' satisfaction at Redeemer's University and examined how user surveys have been employed in a number of previously published literatures. The author used survey research method because similar studies adopted the approach. A questionnaire was designed and used to collect data. Population for the study comprised academic staff and students. The questionnaire was administered to users who visited and used the library within the period of research through the assistance of the library assistants. The data were analyzed using simple percentages and frequency counts. The study revealed that of the academic staff and students, who formed the population for the study, students were found to have used the library most; the College of Management Sciences had the highest frequency of use and it also showed that users were satisfied with the services of the library. Adeniran posited that libraries must improve the quality of their services to enable them face the challenges of information explosion in the 21st century. Service-oriented organizations have identified the customer or user as the most critical voice in assessing service quality. For assessment of service quality to be effectively carried out in academic libraries, it is imperative to investigate what service quality is to users.

Iwhiwhu and Okorodudu (2012) examined the satisfaction of library users to public library information resources, services and facilities at the Edo State Central Library in Benin City, Nigeria. The study confirmed the satisfaction of library users with some of the library's facilities, but not with its information resources and services. The finding is attributable to its insufficient services and poor information resources. It also noted the serious implications of the users' unsatisfactory level to themselves and the library. Similarly, Verzosa (1999) posited that the extent to which the user's needs are satisfied depends on the size and collection of the library, the adequacy and accuracy of the organization of its materials,

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

the usefulness of its catalogues and finding tools in providing access to its collection, and the ability and cooperation of the library staff in bringing these materials (or information on these materials) to the attention of the users, and in maximizing the exposure of the users to these resources and to other library services. Verzosa found that some aspects of library service are more easily evaluated than others. Generally, the more concrete or specific the user requirement is, the easier it is to measure user's satisfaction in absolute terms. The extent to which the library is used reflects the degree of user's satisfaction, which may be measured by subjective procedures such as questionnaires or interviews, or by more objective, quantitative measures, such as percentage calculations and determination of capability indexes, etc. This researcher will investigate the extent of use (visits to the library) by users as part of the variables in determining level of satisfaction.

Andaleeb and Simmonds (1998) investigated five-model propositions to explain user's satisfaction with academic libraries. The models are:

1. *The higher the perceived quality of the library's resources, the greater the level of user's satisfaction.* It is overall perception of a library's resources that contributes to user's satisfaction.
2. *The greater the responsiveness of the library staff, the greater the level of satisfaction among academic library users.* These measures address waiting time, availability of the staff to help users when needed, and whether the staff quickly make sure that users have what they need, willingness of the staff to be helpful and to provide prompt services.
3. *The greater the perceived competence (Skills) of the library staff, the greater the level of user's satisfaction. Competent services* focused on the library staff being good at explaining how materials are arranged, their knowledge, their ability to answer questions appropriately, and their ensuring that all questions are answered.
4. *The more positive the demeanor of the library staff, the greater the level of user's satisfaction.* The construct is depicted by staff sensitivity to user needs, willingness to listen to user problems, being polite, being courteous, and being sympathetic and reassuring.
5. *The better the perceived overall physical appearance of the library facilities, the greater the level of user's satisfaction.* overall cleanliness of the facilities, visually appealing environment, and appearance of the staff

Self-designed questionnaire was used as it was consistent with other studies. Interviews were conducted with a small, but representative, sample of conveniently chosen library users. The questionnaire included perceptual measures that were rated on seven-point Likert scale items. The design was consistent with prior studies on service quality. The study was for users from three academic libraries. Copies of the questionnaire were administered personally to respondents as they entered the library. The sample was chosen using systematic sampling technique and multiple-regression analysis was used to test the propositions.

The findings of this study also suggested that library users, especially students, accord significant importance to the demeanor of the library staff and resources more than other variables. Resource strategy is important because academic library users frequent their libraries to find solutions to their academic problems and needs. Consequently, academic librarians must continuously monitor the academic environment to provide customer-focused services. Although conveying an image of competence appeared to be important in the authors' preliminary research, the weak link between the variable and satisfaction may be attributed to the possibility that competence works through some intervening variable to influ-

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

ence user's satisfaction. This study is necessary to confirm or invalidate the influence of competence on user's satisfaction.

Similarly, Ababio, Aidoo, Korankye, Saeed, Louis, and Nsowah-Nuamah (2012) determined the satisfaction levels amongst students and significant factors that influence overall students' satisfaction in Kumasi Polytechnic with the various services provided by the library, using ordinal logistic regression model. The data used in the study were obtained from a self-administered questionnaire administered by the researchers in the library hall. Among the sampled students, majority (57.2%) of them thought that the overall service quality of the library was good while 30.8% thought it was moderate. About 6.7% and 4.3% thought the overall service quality of the library was excellent and poor respectively. In general, the estimated model suggest that among all the variables, availability of current and relevant materials, adequate user instructions, reliable internet facilities as well as friendly and helpful library staff were the first four (4) library service segments that highly influenced the students' ratings for overall service quality. To determine the possible factors influencing the overall satisfaction level of the respondents, an ordinal logistic regression model was specified. This type of model was chosen due to the ordinal and polytomous nature of the response variables. From the estimated model, the overall service quality decreases when students are less satisfied with the individual service components. The authors stressed that quality assurance demands that, libraries from time to time, need to be assessed and evaluated by its users. The users' satisfaction is considered to be a reliable benchmark for determining library effectiveness. This researcher is not looking at the significant factors that influence overall users' satisfaction; hence ordinal logistic regression model may not be required. The study considered only students, but this researcher will consider all registered users that visit the library.

Similarly, Shah (2013) empirically investigated the relationship between the quality of services provided by the library and the level of user satisfaction from these services. The data was collected with self administered questionnaires from the SCEE NUST (School of Civil and Environmental Engineering, National University of Science and Technology) library users. The study used regression analysis to analyze the data. Results show a significant positive relationship between library services quality and user satisfaction. On the survey, regarding user's satisfaction, Lancaster (1995) posited that survey has concentrated largely on studies designed to gather objective data on the performance of library services. Nevertheless, the impressions of users regarding the library's services do have value. They indicate how "happy" the customers are and also can be used in a diagnostic way to identify possible sources of dissatisfaction. Lancaster emphasized that questionnaire can be employed with samples of library users randomly to determine their satisfaction with library's services. Hence, the research administered questionnaire to samples of library users in the library randomly to determine their levels of satisfaction with University library services.

Nnadozie (2006) evaluated the services and collection of the Federal Medical Centre Library, Owerri, Nigeria. Findings revealed that the librarians were not proactive and that there was no personalized information service in place. The author concluded that the basic tools and facilities for the delivery of qualitative library services are either available in inadequate quantities or completely non-existent; this, according to the author, explains why most of the patrons are not satisfied with the library. This is why the researcher includes tangibles-the physical aspects of the service such as equipment, facilities, and resources as part of the variables examined in this study. In the same vein, Sureshchandar, Rajendran, and Kamalanabhah (2002) found that service quality and customer satisfaction were highly related. Users' expectations have increased as a result of rapid development of advanced information technology, increasing generation of new knowledge and information availability from both printed as well as online

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

media. User's satisfaction and optimization of resources have become important areas for libraries. Many libraries especially the University libraries are focusing on evaluation of the users' needs and their satisfaction with their services. The authors found that user surveys provide useful perceptions of service quality in libraries. User's satisfaction is based on service quality delivered by library personnel. Service quality is a product of acquired skills necessary for effective service delivery. The ability of the library personnel to provide relevant and time-saving services in University libraries leads to users' satisfaction.

Rehman, Khalid, Muhammad, & Mahammad. (2009) explored the satisfaction level of users with the services of Punjab University Library. The descriptive survey method was used for data collection. The data was collected through self administered questionnaire from 458 library users. The questionnaire assessed the user's perception of various elements which take part in the performance of the library. The results revealed that users were satisfied with library opening hours, circulation system, photocopying facility, attitude of library staff and library environment. There was need for improvement in the areas of library membership, acquisition of reference & other material, knowledge and competency of library staff, Internet facility and updating of library home page. The training regarding the use of library is the most demanding area for the improvement of user satisfaction level. Simmonds and Andaleeb (2001) noted that with the advent of online catalogues, CD-ROMs, online data-bases, other electronic resources, new methods of document delivery, and access to information, the role of the academic library has begun to change. Students do not have to be physically present in the library in order to access the library's resources. With the Internet and the availability of new technologies and numerous indexes, abstracts, and databases, the range of services that academic libraries can provide has increased dramatically. Users can access the libraries' resources without stepping into the library building. They can also very easily access other libraries' resources, such as online catalogs and unrestricted databases. The Internet has opened the resources of libraries to students and faculty worldwide. The University libraries in Nigeria are still striving to operate libraries virtually as noted by Simmonds and Andaleed. Users still go to libraries physically to access information resources both print and non print in University libraries of North-Central, Nigeria. The authors also noted that instruction on how to critically evaluate both print and electronic resources would help users appreciate the multitude of sources currently available for research, and increase user's satisfaction with academic libraries.

Consequently, the need for librarians to make sure that users know how to use library resources not only in the confines of the library building, but even when they access the resources remotely is very important in meeting users' needs. Users can access library online catalogs and electronic resources remotely from their dormitory rooms, computer laboratories, home computers and offices if the facilities are available. However, with basic library instruction, many users find it difficult to comprehend and manipulate the many complexities of information search; they easily forget what is taught in orientation or course-related instruction sessions. Hence, for users' satisfaction to be a reality, library personnel therefore need to reinforce users' orientation with other effective search techniques (skills acquired) to make it easier for them to utilize those techniques when they are working independently away from the library environment.

Simmonds and Andaleed further stressed that emphasis on instruction and knowledge on how to use these resources can help to increase library usage and also to enable them to evaluate more effectively the resources they find when they do research to increase their level of satisfaction with information service delivery. Accordingly, Abagai (1993) noted that the use of library by users and indeed their satisfaction with library services depend on the availability of suitable learning materials, accommodation and competent staff in the library. Similarly, Igben (1993) noted that for a library to be most functional,

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

the services it renders should correspond closely with the needs of its users. Ensuring that relevant information resources are provided and made accessible to users goes a long way to encouraging users to visit the library more often. However, the study by Wang and Shieh (2006) on the relationship between service quality and customer's satisfaction: example of CJCU library, used five dimensions of service quality: tangibles, responsiveness, reliability, assurance and empathy. The result indicated that overall service quality has a significantly positive effect on overall user's satisfaction. All the dimensions except responsiveness have a significantly positive effect on overall user's satisfaction. In addition, the five important service quality features ranked by users are: collections, loaning and returning services, overall atmosphere, electronic database system, and online reservation and renewal. They furthered stressed that user's satisfaction is what librarians always devote efforts to pursue. User's satisfaction comes from services quality, which is based on whether readers are satisfied or not. When users are not satisfied, it is inferred that something is wrong with service delivery. Service quality is meeting users' expectations or the overall excellence of library services that satisfy users' expectation

Similarly, Mahawar, Verma and Narayan (2009) investigated satisfaction level of P.G students in University of Lucknow Library with the services provided by the library. Frequency of library visit, satisfaction with opening hours of the library, library collection, and user's satisfaction from library services were considered. The study revealed that most of the users were partially satisfied with library services. Similarly, Seneviratn (2006) Measured user's satisfaction of the PGlM Branch Library at Peradeniya. Copies of questionnaire were administered to a random sample of 120 users and 74 responded. Most respondents were very satisfied with the overall library services and staff performance; moderately satisfied with the print collection. The helpfulness of the staff was rated the best. Seneviran posited that user community is the most important component of a library. Every information service exists for the sole aim of satisfying its users. How well this purpose is served is a measure of the effectiveness of that information service.

Similarly, Iwhiwhu and Okorodudu (2012) posited that the satisfaction of library users is a function of the quality of information product(s) received. Also that, satisfaction is a function of three main sources— quality of the information product, the information system and the services that make the information product available. These sources of satisfaction, when properly harnessed may contribute to users' overall satisfaction. However, Awana (2007) maintained that the friendly disposition of staff, the willingness of library staff to assist users to get needed materials from within or through inter-library loan will encourage users to patronize the library and above all increase users' satisfaction with library services. Again, Iwhiwhu and Okorodudu noted that researchers are of the opinion that attitude of some library staff that bothered on hostility, rudeness and lazy approach to requests or enquiries have often put off some potential library users. Similarly, Unomah (1986) in a survey of students utilization of academic libraries in Nigeria found that most often than not, some of the junior staff's attitude towards users are discouraging in their services to the students. The negative attitude of some librarians towards information technology in library operations is not encouraging. Supporting this, Ifidon and Okoli (2002) noted that the nature of library staff is a factor that inhibits effective library services. They further stressed that most of the staff went through the traditional form of training in which some of them just refused to adjust to the new situation, but want the status quo to remain.

Chandrasekar and Murugathas (2012) discussed the results of the user's satisfaction survey conducted in the Jaffna University Library among the undergraduates of general degree bioscience students in August 2010. The objectives of the study were to assess the library users' satisfaction regarding the currently available information sources and services and to identify the unmet needs of the undergradu-

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

ates for the future developments in the library. Self-administered questionnaire survey was conducted among these undergraduates. The study clearly enumerated that the efficiency of some of the presently available services such as photocopying services, interlibrary loan services, selective dissemination of information and current awareness service did not meet the undergraduates' expectations. . The findings of the survey leave plenty of scope for improvement in library activities. The researcher found that few variables were considered in the study, hence there was need for another research to consider other user's satisfaction variables which this study investigated.

However, Martensan (2003) reviewed literature and surveyed focus groups, and came up with the key determinants of library service quality as: electronic resources, collections of printed publications, other library services, technical facilities, library environment and human side of user services. Similarly, Majid, Anwar, and Eisenschitz (20001) applied a questionnaire survey to investigate all possible factors that had great impacts on library performances. The findings revealed that, collections equipments, and physical facilities were viewed as most important issues. Similarly, Chancy and Hseih (1996) conducted an exploratory study on the perceptions of library service quality, focusing on key users including faculty and students from 21 universities in Taiwan. They employed questionnaire survey and a series of factors analyses. The result showed seven factors: competence, moderation, convenience, tangibles, communications, and sufficiency of staff as major determinants of service quality. In the same vein, Lee (1999) conducted a case study on the library of Council for Economic Planning and Development of Executive Yuan, investigating users' usage on the Library service and their satisfaction. Circulation operations, collections utilization environment and physical facilities, attitude of the staff, serving manners, and education and consultancy are considered as 6 major dimensions of evaluating user's satisfaction. However, Unagha (2009) focused on the challenges facing Nigerian University libraries in meeting users' service demands in the 21st century and the role of University administrators in assisting them in this regard. The study identified these challenges as non-application of technology to service delivery, increase in student intake with its attendant effect on the available limited resources, inefficient reference service, and competition from other service providers. The article recommends amongst others that knowledge and application of technology in service delivery in libraries is unavoidable in this century, quality service delivery in terms of selection and acquisition of appropriate materials should not be taken lightly among others

Accordingly, the researcher therefore investigated service quality from users' perspective because from literatures, there is a strong link between service quality and user's satisfaction. The researcher investigates the following determinants of service quality in this study:

1. Access- users' ease and convenience of accessing the service(s), convenient service hours; alternative methods of accessing services: e.g. Internet; access to digital collections from PC; instruction in use and/or training sessions, availability of required information/materials and timely document delivery
2. Communication- keeping users informed of services; comprehensive pamphlets/guides and flyers
3. Competence-having the skills and knowledge to provide needed service(s), up-to-date knowledge and skills
4. Reliability- providing consistent, accurate and dependable service(s); delivering the service timely, dependability in handling user's service problems
5. Responsiveness- being willing and ready to provide service(s) when needed, readiness to respond to user's questions

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

6. Understanding the user-knowing individual user needs, tailoring services where necessary to meet individual needs (SDI)
7. Tangibles-the physical aspects of the service such as equipment, facilities, resources.

Constraints to the Use of Smartphones for Research

The utilization of smart phones especially in the developing countries has not been without problems. eCycle (2012) identifies the following problems to include: cost, size of device, battery life, and usability (small keypad making it hard to type. Kuznekoff and Titsworth (2013), observed that students who use their smart phones during class lectures tend to write down less information, recall less information, and perform worse on a multiple choice test than those students who abstain from using their mobile phones during class. Smart phones usage by students have more other challenges despite the fine picture earlier painted. Even though smart phones are powerful with amazing speed, their screens remain comparatively small and navigations is also difficult thus, making users lose more time in searching for information. According to Baidu (2015), there are seven common smart phone issues that get in the way of enjoying your many devices. The report detailed three particular categories' that show when these issues typically occur: battery related, speed-related, and storage space-related. He further listed some of the problems with smart phones to include but not limited to: overheating, too much trash, slow online speeds, not enough space, phone crashes, slow response time and finally, not enough standby time.

Tindell and Bohlander (2012) embedded the survey of 269 college students from a private university in north-eastern Pennsylvania to gain understanding of the use and abuse of cell phones in a college classroom setting, and to potentially aid in policy-making decisions. The researchers found that students are spending time texting and are not paying attention to the class lecture. Elder (2013) found that cellphones were distracting and that vibrating phones in the classrooms were problematic. According to Hanson, Drumheller, Mallard, McKee and Schlegel (2011) students in the library used email, instant messaging and websurfing rather than checking the library's online resources. Although students want to make academics a priority, they have a difficult time balancing their school life with their need for financial and social support. It was found that students focus more on updating their Facebook status than downloading their homework assignments. Smart phone challenges includes incessant virus attack, high cost of data subscription, irregular/ unstable power supply for charging of battery, lack of experts to repair.

Several studies conducted on utilization of smartphone for research by undergraduates students both within and outside Nigeria concentrated on availability, accessibility and utilization of smart phones. In a related study, Ikenwe, Iguehi, Idhalama, Ogagaghene and Inegbenojie studied the use and impact of Smartphone's by medical students in Ambrose Alli University, Ekpoma, Edo State, Nigeria. Survey research method was adopted and a structured questionnaire was used to collect data. A total of two hundred and thirty (230) medical students were sampled using accidental sampling technique. Data was analyzed using descriptive statistics and mean statistics. The result revealed high level of awareness and use of Smartphone's by medical students. There is a tremendous impact of Smartphone's on the academic work of medical students and the use of Smartphones for carrying out assignments, downloading E journals, downloading medical apps and e-textbooks, browsing the internet amongst others. It was also revealed that irregular power supply, high risk of radiation when using Smartphone, insecurity of usage, operational difficulties and lack of technical experts on repair within campus are some challenges encountered by medical students in Ambrose Alli University, Ekpoma, in the use of Smartphones.

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

In a similar study, Alfawareh and Jusoh (2014) studied the use of smartphones among university students of Najran University in Saudi Arabia. Survey research method was adopted and a structured questionnaire was used to collect data. A total of three hundred and twenty foury (324) students were sampled. Data was analyzed using descriptive statistics and mean statistics. The result revealed students owned smart phones, and was used like mobile by using as a computer connected to internet and a digital camera. Smartphone was used for learning purposes, it trough student portal, most students never had Blackboard access. and never used smartphones for taking notes in a classroom, never used smartphones to record class lectures and not at all used for downloading materials related to class.

Chen and Denovelles (2013) investigated the potential use and barriers of smartphones among undergraduate and graduate students of University of Central Florida. Survey research method was adopted and a structured questionnaire was used to collect data. A total of eight hundred and nine (809) students were sampled. Data was analyzed using descriptive statistics and mean statistics. The result revealed that students need more academic friendly devices such as tablets and additional support to integrate mobile technologies into learning related activities.

In a similar study, Johnson and Radhakrishnan (2016) studied the academic use of smart phones among students of Al Ghurair University, Dubai, United Arab Emirates. Survey research method was adopted and a structured questionnaire was used to collect data. A total of two hundred (200) students were sampled. Data was analyzed using mean, standard deviation, Chi square value. The result revealed that academic use, advantages and impact of smart phones proved to be positive. Comparison of students' opinion about academic advantages and impact of using smart phones by gender and age revealed positive perceptions towards smart phones as academic support tool.

In a related study, Alson and Misagal (2016) studied use of smartphones among college students of two colleges of the University of Perpetual Help-Calamba. Survey research method was adopted and a structured questionnaire was used to collect data. A total of one hundred twenty five (125) students were sampled. Data was analyzed using descriptive-evaluative design. The result revealed that smartphones such as sending messages (SMS), calling, chatting, opening documents, checking e-mails, internet browsing and downloading informative files that have shrunk the globe and erased the borders of getting information and learning processes were used. Socializations in forms of Facebook, Twitter &Instagram are smartphone features were used by college students, aided learning like using it as calculator, taking down notes and online search on urgent topic. Entertainment such as listening to music and taking pictures were also very popular use of smartphones among students. However, despite that benefits of smartphone usage transcends genders, majority of the female were addicted users.

In a similar study, Emran Hossain (2014) studied the use of smartphone in accessing information by the students of Dhaka University. Survey research method was adopted and a structured questionnaire was used to collect data. A total of three hundred and thirty three five (333) undergraduate and postgraduate students were sampled. Data was analyzed using statistical software SPSS program version 11.5, and MS word, MS Excel. Mann- Whitney (M-W) and Kruskal-Wallis (K-W) tests were conducted to further analyze the influence of students' demographic and individual characteristics. The result revealed that the status of smartphone usage by the students of is satisfactory. Students' used smartphone in accessing information from internet. Findings provided evidence on the actual use of smartphone by the students for accessing information and their attitude towards implementing an online or internet based study system. smartphone helps to locate the possible advantages and relative drawbacks regarding access to information from internet.

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

CONCLUSION

Smartphone were used by undergraduates for research and has produce positive impact on academic performance of students. However, teaching staff could also use smartphones to enhance teaching and learning.

RECOMMENDATIONS

The following recommendations are made as follows:

1. Institutional management should inculcate mobile teaching and learning curriculum in syllabuses at the various levels.
2. Mobile services should be integrated into library operations/services.
3. Library resources and services should be made available in forms that are compatible with mobile devices.
4. Library staff, lecturers and university staff generally should be sensitized and trained in the use of mobile devices for teaching and learning purposes.
5. Standardized training programs in the use of mobile devices for learning purposes should also be established for the students. The training programs should be frequently updated to accommodate new technological developments and innovations in mobile usage for academic purposes.
6. Wireless internet infrastructure in the university should be upgraded to ensure quality, speed and availability to students. Multiple access points should also be made available to students, both within the university and in the hostels. This will go a long way in augmenting the cost of data payment on students' mobile phones.

REFERENCES

Aina, L. O. (2002). *Research in Information Sciences. An African Perspective*. Ibadan: Stirling Horden Publishers.

Albarran, A. B., & Hutton, B. (2009). Young Latinos use of mobile phones: A cross-cultural study. *Revista de Comunicacion, 8*(1). 95-108. Available at http://beta.udep.edu.pe/comunicacion/rcom/pdf/2009/Art095- 108.pdf

Alfawareh, H. M., & Jusoh, S. (2014). Smartphones usage among university students: Najran University case. *International Journal of Academic Research*, *6*(2), 321–326. doi:10.7813/2075-4124.2014/6-2/B.48

Angulo, J., Bermudo, P. J., Buñag, W., Clapano, E., Cuy, N., Mendoza, E. J., & Sicat, R. (2011). *The Perpetualite: Identity and Dignity*. Mindshapers Co., Inc.

Baker, W. M., Lusk, E. J., & Neuhauser, K. L. (2012). On the use of cell phones and other electronic devices in the classroom: Evidence from a survey of faculty and students. *Journal of Education for Business*, *87*(5), 275–289. doi:10.1080/08832323.2011.622814

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

Balakrishnan, V., & Raj, R. G. (2012). Exploring the relationship between urbanized Malaysian youth and their mobile phones: A quantitative approach. *Telematics and Informatics*, *29*(3), 263–272. doi:10.1016/j.tele.2011.11.001

Blumenstock, J. J., & Eagle, N. (2010). Mobile Divides: Gender, Socio-economic Status, and Mobile Phone use in Rwanda. U.C. Berkeley School of Information Berkeley.

Boruff, J. T., & Stories, D. (2014). Mobile devices in Medicine: Survey of How Medical Student, Residents and Faculty Use Smart Phones and Other Mobile Devices to Find Information. *Journal of the Medical Library Association: JMLA*, *102*(1), 22–30. doi:10.3163/1536-5050.102.1.006 PMID:24415916

Boulos, M. N. K., Wheeler, S., Tavares, C., & Jones, R. (2011). How Smart Phones are Changing the Face of Mobile and Participatory Healthcare: An overview, with example from Ecaalyx. *Biomedical Engineering Online*, *10*(24), 1–4. Retrieved from http://wwwbiomedical-engineering-online.com PMID:21466669

Brown, K., Campbell, S. W., & Ling, R. (2011). Mobile phones bridging the digital divide for teens in the US? *Future Internet*, *3*(2), 144–158. doi:10.3390/fi3020144

Davies. (2012). Mobile Medical Education (MOMED) - How mobile Information Resources Contribute toLearning for Undergraduate Clinical Students. A mixed Method Study. *Biomed Central, 12*(1), 1-11. Retrieved from: http://www.biomedcentral.com/ 1472-6920/12/1/prepup

Elder, A. D. (2013). College students' cell phone use, beliefs, and effects on their learning. *College Student Journal*, *47*(4), 585–592.

Elogie, A.A., Ikenwe, I.J., & Idubor, I. (2015). Factors influencing the adoption of smartphones by undergraduate students at Ambrose Alli University, Ekpoma, Nigeria. *The Information Technologist: An International Journal of Information and Communication Technology, 12*(1).

Froese, A. D., Carpenter, C. N., Inman, D. A., Schooley, J. R., Barnes, R. B., Brecht, P. W., & Chacon, J. D. (2012). Effects of classroom cell phone use on expected and actual learning. *College Student Journal*, *46*(2), 323–332.

Fuxin, A.Y. (n.d.). *Mobile Smart Phone Use in Higher Education*. Academic Press.

Gay, L. R., Mills, G. E., & Airasian, P. W. (2011). Educational research: competencies for analysis and applications. Boston, MA: Pearson/Prentice Hall.

Ghazizadeh, S. (2012). *Acceptance theory on mobile services and applications*. Vaasan Ammattikorkeakoulu University of Applied Sciences.

Hakoama, M., & Hakoyama, S. (2011). The Impact of Cell Phone Use on Social Networking and Development Among College Students. *American Association of Behavioral and Social Sciences Journal*, *15*, 1–20.

Hanson, T. L., Drumheller, K., Mallard, J., McKee, C., & Schlegel, P. (2011). Cell phones, text messaging, and Facebook: Competing time demands of today's college students. *College Teaching*, *59*(1), 23–30. doi:10.1080/87567555.2010.489078

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

Hingorani, K.K., Woodard, D., & Danesh, N.A. (2012). Exploring how smartphones supports students' lives. *Issues in Information System, 13*(2), 33-40.

Ikenwe, I.J., Idhalama, O.U., & Inegbenojie, O.E. (2017). Empirical Look at the Use and Impact of Smart Phones by Medical Students for Laboratory/Educational Purposes at Ambrose Alli University, Ekpoma, Edo State. *Greener Journal of Educational Research*, *7*(4), 61-69.

Johnson, C., & Kritsons, W. A. (2007). National School Debate: Banning Cell phones On Public School Campuses in America. *National Forum of Education Administration and Supervision Journal, 25*(4), 1-6.

Jubien, P. (2013). Shape Shifting Smart Phones: Riding the Waves in Education. *Canadian Journal of Learning and Technology*, 39.

Kanelechi,, C.K., Nwangwa, E.Y., & Omotere, T. (2014). Undergraduates and Their Use of Social Media: Assessing Influence on Research Skills. *Universal Journal of Educational Research*, *2*(6), 446–453.

Koh, K. C., Wan, J. K., Selvanathan, S., Vivekananda, C., Lee, G. Y., & Ng, C. T. (2014). Medical Student Perceptions Regarding the Impact of Mobile Medical applications on Their Clinical Practice. *Journal of Mobile Technology in Medicine*, *3*(1), 46–53. doi:10.7309/jmtm.3.1.7

Lenhart, A., Purcell, K., Smith, A., & Zickuhr, K. (2011). *Social Media & Mobile Internet Use among Teens and Young Adults.* Washington, DC: Pew Internet & American Life Project. Retrieved from: http://www.sde.idaho.gov/site/idahoStatePreventionConf/IPC%202011%20Presentations/Using%20Social%20Me dia/PIP

Litchfield, S. (2010). Defining the Smart phone. Retrieved from http://www.allaboutsymbian.com/feature/item/defining-he-smartphonephp

Littlejohn, S. W., & Foss, K. A. (2009). *Encyclopedia of Communication Theory*. SAGE Publications, Inc. doi:10.4135/9781412959384

Maguth, B. M. (2013). The educative potential of cell phones in the social studies. classroom. *Social Studies*, *104*(2), 87–91. doi:10.1080/00377996.2012.655347

Mayer, R. E., & Moreno, R. (2003). Nine Ways to Reduce Cognitive Load in Multimedia Learning. *Educational Psychologist*, *38*(1), 43–53. doi:10.1207/S15326985EP3801_6

Paddock, C. (2012). *Ipads in Health and Medicine: More than an Information Revolution*. Retrieved from: http://www.marcprensky.com/writing/prensky.DigitalWatixes,Digitalimmigrants parts.pdf

Rabiu, H., Muhammed, A.I., Umaru, Y., & Ahmed, H.T. (2016). *Impact of Mobile Phone Usage on Academic Performance Among Secondary School Students in Taraba State*. vlzn/p466 doi:10.19044/esj.2016

Sarwar, M., & Soomro, T. R. (2013). Impact of Smart Phones on the Society. *European Journal of scientific Research*. Retrieved from http://www.europeanjornalofscientificreasearch.com

Taylor, A. S., & Harper, R. (2003). *Talking Activity: Young People and Mobile Phone, CHI, 2001 Workshop: Mobile Communication*. Seattle, WA: Understanding Users, Adoption and Design.

Vafa, S., & Chico, D. E. (2013). A Needs Assessment For Mobile Technology Use in Medical Education. *International Journal of Medical Education*, *4*(4), 230–235. doi:10.5116/ijme.5259.4a88

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

KEY TERMS AND DEFINITIONS

ICT: In this study refers to information and communications technology (or technologies) that is the infrastructure and components that enable modern computing.

Information Resources: It is referred to in this study as library resources, information bearing materials and information retrieval tools in human, print or electronic form (e.g., library staff, encyclopedia, dictionary, computers, indexes, abstracts, among others).

Research: It is referred to in this study as assignments, examination, seminars, and project reports.

Smart Phones Usage: In this study refers to the amount of time spent on over conventional mobile phones.

Smartphone Impact: In this study refers to massive change bought about in the lives of people using mobile phones through advancement in science and technology.

Smartphones: In this study refers to mobile phone running on a complete operating system in a manner similar to a traditional computer, which offer advanced computing abilities and connectivity options.

Undergraduates: In this study refers to students studying for their first degree (usually entitled Bachelor of Arts [BA] or Bachelor of Science [Bsc] in a university).

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

Chapter 18
Use of Social Media in Libraries and Impact on Undergraduates

Jane Igie Aba
Ambrose Alli University, Nigeria

Theresa Osasu Makinde
Ambrose Alli University, Nigeria

ABSTRACT

This chapter examined the use of social media in libraries and impact on undergraduates. The study covers concepts of utilization of social media: benefits, impact, and challenges that affect the use of social media and academic performance of undergraduate students. The concepts generally implied that social media is the use of technology as the best medium to explore wide area of knowledge to produce positive impact on academic performance of students. There is a direct relationship between social media usage and the academic performance of students. It was recommended among others that awareness programs of use of social media platforms should be provided by the university and library to students; access to use of social media resources and services by librarians should be provided to students; educational forums that will facilitate group collaboration and discussion on academic performance should be promoted in universities; connectivity to social media network sites and internet should be improved to facilitate instant information search by students.

INTRODUCTION

Modern communication technology has transformed the entire world into a "Global village". Technology is like two sides of a coin with negative and positive sides. It helps people to be better informed, enlightened and keeping abreast with world developments. Technology exposes mankind to a better way of doing things (Osharive, 2015). Currently, there is a growing awareness and increase in the use of Social Media (SM). Social network is a social structure made up of individuals or organizations called "nodes", which are tied (connected) by one or more specific types of interdependency, such as friendship, kinship, common interest, financial exchange, dislike, sexual relationships or relationships of beliefs, knowledge or prestige (Adeboye, 2012, cited in Asemah and Edegoh, 2012). Social network

DOI: 10.4018/978-1-5225-9034-7.ch018

Copyright © 2020, IGI Global. Copying or distributing in print or electronic forms without written permission of IGI Global is prohibited.

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

can also be referred to as a map of specified ties, such as friendship, between the nodes being studied. The nodes, to which an individual is connected are the social contacts of that individual. Social networking sites include: Yahoo Messenger, Facebook Messenger, Blackberry Messenger (BBM), Google talk, Google+Messenger, iPhone, Androids. These networking sites are used by most people to interact with old and new friends, physical or internet friends (Adeboye, 2012, cited in Asemah and Edegoh, 2012). Martn, (2008) & Lusk, (2010) also stated that social media is the use of Facebook, Blogs, Twitter, My Space and LinkedIn for the purpose of communication, sharing photos as well as videos.

The growth of social media over the years has changed the way users communicate, collaborate and exchange knowledge through the various platforms (Wasko, Teigland and Faray, 2009). Similarly, the World Wide Web has been radically transformed, shifting from an information repository to a more social environment where users are not only passive receivers or active harvesters of information but creators of content (Bruns, 2008). Social media is built on the idea of how people know and interact with each other. It gives people the power to share, making the world more open and connected with each other. Social networking has a vital influence on our lives. Social media provides data easy and quick information within a fraction of seconds. Social media applications therefore allow users to converse and interact, create, edit and share textual, visual and audio content. Social media applications are open rather than closed. Social networking websites provide tools by which librarians communicate, share information and create relationships among users. The popularity of social networking websites has affected social interaction due to technological changes. The way library users interact and talk to each other has changed. These users now socialize through the internet. Social networking websites have also affected our social interaction by changing the way we interact face-to-face, receive information, and the dynamics of social groups and friendships have equally change (Asur and Huberman, 2010).

CONCEPT OF SOCIAL MEDIA

Social media and library services are intervening concepts. Thus, social media is a term that encompasses that internet forums, weblogs, social blogs, micro blogging, wikis, podcasts, pictures, video, rating and social bookmarking (Sanusi *et a*l., 2014). It involves the use of technology as the best medium to explore and share information resources. According to Andreas and Michael (2010) social media is a group of internet based application that builds on the ideological foundation and allows the creation and exchange of users-generated content. Thus, social media comprise online applications for social networking sites, social bookmarking and sharing tools, social citation tools, blogging and microblogging tools, virtual worlds, e-conference presentation sharing tools, audio and video tools, e-project management tools, and research and writing collaboration tools; primarily developed to foster user-centered social interaction. Social media is the relationships that exist between network of people such as library users (Qingya, Wei & Yu, 2011). It is used to describe different types of electronic communication platforms. The availability of high speed internet broadband connection with massive use of desktop computers, laptops, e-readers, tablets and smart phones enable millions of library users to actively engage in social networking, text messaging, blogging, content sharing, online learning, and much more. Social media are technologies that facilitate social interaction, collaboration and enable deliberation across stakeholders. These technologies now include blogs, wikis, media (audio, photo, video, text) sharing tools, networking platforms, and virtual worlds (Bryer and Zavatarro, 2011). There is a direct relationship between Social

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

media usage and library services in universities. Kyoshaba (2009) stated that academic institutions are established with the aim of imparting knowledge and skills to those who go through them with the use of social media. Therefore, libraries measured their services

TYPES OF SOCIAL MEDIA

Kanelechi, Nwangwa, Ebun, and Omotere (2014) identified the categories and functions of social media (Table 1).

Social media can be used to enhance library services in the followings areas:

1. *Social Bookmarking:* Interact by tagging website and searching through website book marked by others (Blink List, Simple); (Anjugu,2013)
2. *Social News:* Interact by voting for articles and commenting on them (Digg, Propello).
3. *Social Networking:* Interact by adding friends, commenting on photo and profiles, sharing groups for discussions (Facebook, Imo, Whatsapp, Snapshat, Instagram, Blackberry Messenger chat);
4. *Social Photo and Video Sharing:* Interact by sharing photos or videos and commenting on the user submission (YouTube and Flicker, Instagram); and
5. *Wikis*: Interact by adding articles and editing existing articles (Wikipedia).

Similarly, Social media can include blogs, wikis, media (audio, photo, video, text), sharing tools, networking platforms, and virtual worlds (Boyd & Ellison, 2008). Kaplan and Haenlein (2010) also classified social media into six distinct categories for library services such as:

Collaborative Projects

This enable the joint and simultaneous creation of knowledge related content by many end-users. Whereas blog content is authored by a single person or a few editors and may later be commented on by others, collaborative projects are different in that they allow all users to equally post, add, or change content. They are probably the most democratic form of social media. Collaborative projects allow library users to add and edit content in a community-based data base. There are different types of collaborative projects and they include:

- **Wikis**: Wiki means “quick” in the Hawaiian language and its originator, Microsoft Encarta described a wiki as a type of server software that enables users to create or alter content on a Web page. Wikis are interlinked web pages based on the hypertext system of storing and modifying information. Each page can store information and is easily viewed, edited, and commented on by other people using a web browser. Functionally, a wiki is meant to engage individuals to regularly update wiki pages in a collaborative fashion, to add new information, and to create links between pages. This can be beneficial to library users when a wiki is employed as part of a blended learning approach (Neumann & Hood, 2009). For instance, Wikipedia, a free online encyclopedia ransform the web into a collaborative environment as it enables library users to create and edit encyclopaedia articles (Desilets et al., 2005).

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

Table 1.

S/N	Category of Social Media	Functions
1	Social Networking Sites (SNS)	*Facebook* - www.facebook.com (Facebook is a social utility that connects people with friends and others who work, study and live around them, even if they are in other countries). *LinkedIn* - www.linkedin.com (LinkedIn is a social networking website for people in professional occupations.) *Research Gate* - www.researchgate.net (This is a social networking site for scientists and researchers to share papers, ask and answer questions, and find collaborators) *Academia* - www.academia.edu (Academics use the platform to share their research, monitor deep analytics around the impact of their research, and track the research of academics they
2.	Social Bookmarking and Sharing Tools	*CiteULike* - www.citeulike.com (This social bookmarking site allows users to save and share citations of academic papers amongst researchers). *Delicious* - www.delicious.com (This is a social bookmarking web service for storing, sharing, and discovering web bookmarks). *Digg* – www.digg.com (This is a news aggregator site that share the most interesting and talked about stories, videos and pictures on the web). *Reddit* - www.reddit.com (Reddit, stylized as reddit, is a social news and entertainment website where registered users submit content in the form of either a link or a text post of either a link or a text post).
3	Blogging and Microblogging Tools	*Blogger* - www.blogger.com (This is a weblog publishing service from Google, for sharing text, photos and video). *Wordpress* - www.wordpress.org (It's an open source blogging tool and a content-management system (CMS) based on PHP and MySQL, which runs on a web hosting service). *Tumblr* - www.tumblr.com (This is a microblogging platform and social networking service that allow users to post multimedia and other content to a short-form blog) *Twitter* - www.twitter.com (This is an online social networking site and microblogging service that enables users to send and read "tweets", which are text messages limited to 140 characters. Registered users can read and post tweets but unregistered users can only read them)
4	Virtual Worlds	*Second Life* – www.secondlife.com (This is a free 3D virtual world where users can socialize, connect and create using free voice and text chat) *OpenSim* – www.opensimulator.org (This is an open source multi-platform, multi-user 3D application server. It can be used to create a virtual environment (or world) which can be accessed through a variety of clients, on multiple protocols. It allows virtual world developers to customize their worlds using the technologies they feel work best).
5	Presentation Sharing Tools	*Scribd* - www.scribd.com (This is a digital documents library that allows users to publish, discover and discuss original writings and documents in various languages using their iPhone, iPad, Kindle Fire and Nook tablet). *SlideShare* - www.slideshare.net (This platform allow the sharing of information in PowerPoint, OpenOffice presentations, Keynote, PDF and infographics). *Sliderocket* - www.sliderocket.com (SlideRocket is an online presentation platform that let users create, manage, share and measure presentations).
6.	Audio and Video Sharing Tools	*YouTube* - www.youtube.com (YouTube is a video-sharing website which allow users to share their videos with friends, family, and the world. *Flickr* - www.flickr.com (This is an image and video hosting website with large pool of picture galleries available with social networking, chat, groups, and photo ratings). *Livestream* - www.livestream.com (This is a live streaming video platform that allows users to view and broadcast video content using a camera and a computer through the internet).
7.	Research and Writing Collaboration Tools	*PBworks* – www.pbworks.com/education (PBworks is a commercial real-time collaborative editing system that allow users to capture knowledge, share files, and manage projects within a secure, reliable virtual environment). *Wikispaces* - www.wikispaces.com (The section of this social site allow teachers to create a classroom workspace where the teacher and students can communicate and work on writing projects alone or in teams). *Wikipedia:* www.en.wikipedia.org Wikipedia is a free online encyclopedia, written collaboratively by the people who use it. It is a special type of website designed to make collaboration easy, called a wiki. Jimmy Wales and Larry Sanger launched Wikipedia on January 15, 2001, the latter creating its name, wiki (quick) and encyclopedia.
8.	Project Management, Meeting and Collaboration Tools	*BigBlueButton* – www.bigbluebutton.org (It is built for online learning. BigBlueButton enables universities and colleges to deliver a high-quality learning experience to remote students). *Skype* - www.skype.com (The service allows users to communicate with peers by voice using a microphone, video by using a webcam, and instant messaging over the Internet. Phone calls may be placed to recipients on the traditional telephone networks)

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

- **Social Bookmarking Sites or Collaborative Tagging Services:** This allow library users to organize and share links to websites; interact by tagging website and searching through website bookmarked by others that can subsequently be organized in the form of tag clouds: visual representations of tags, this could be indicated by font size or colours.
- **Online forums or message boards:** The enable library users to hold conversations in form of posted messages. As opposed to wikis, forums usually do not allow library users to edit content posted by others, but rather only respond to or discuss content within their own postings. The right of editing is limited to the librarian who is the forum administrators or moderators. Also, forums only count as collaborative projects when their focus is on the joint creation of knowledge (Kaplan & Haenlein, 2014).
- **Review Sites:** This focuses on exchanging feedback on all areas of knowlegde. The interaction of library users is by voting for articles and commenting on them. These include Propello, TripAdvisor and Epinions.com. The review sites use reputation system to allow library users compute reliability scores based on ratings received within user reviews. These systems are designed to avoid strategic manipulation of the content posted (Kaplan & Haenlein, 2014).
- **Blogs:** These are Web information sharing technology (Boulos, Maramba, & Wheeler, 2006). According to Kaplan and Haenlein (2010), blogs are the social media equivalent of personal web pages with multitude of variations, from personal diaries describing the author's life to summaries of all relevant information on specific content area. Blogs also functions as an online journal with unique date entries about an issue with current comments that shown first in reverse chronological order (Mayfield, 2008). This consists of text, image, videos, commentary, and links to other Web sites, the contents are contributed by library users, professionals and amateurs. Boyd (2006) distinguished blogs from generic Websites in that blogs capture ongoing expressions, not the edits of a static creation and because the expressions are captured locally, not in a shared common space. Moreover, blogs are easily subscribed through RSS technology. Popular blogs include Wordpress, Blogger, Movable, LiveJournal, and Xanga. Although blogs did not originate in education sectors such as the library but have become useful as an authoring tool. According to Kist (2013) Blogs offer library users the opportunity of accessing multimedia records, incorporating video and sound files, as well as images into written record. The ability for library users to comment on each blogs allows collaborative studies and discussions. Åkerlund (2011) states that engaging in dialogues in form of blog comments are associated with positive attitudes towards online peer interaction which motivate library users.
- **Content Communities:** Allow library users to share photos or videos and commenting on other users' submission. It also enable library users to organize, share and comment on different types of contents such as images, videos(Dewing, 2012). The main objective of content communities according to Kaplan and Haenlein (2010) is the sharing of media contents between users. Content communities exist for a wide range of different media types, including text (e.g., BookCrossing), photos (e.g., Flickr), videos (e.g., YouTube), and PowerPoint presentations (e.g., Slideshare). YouTube footages enable direct access to a vast array of performance techniques, interpretative decisions and visual cues that can be replayed and reviewed at will, thus, this enhance the dissemination of information as a learning tool (Jones & Cuthrell, 2011). The YouTube as a tool of communication is very useful in the development of critical awareness and the use of audio-visual resource as a tool for self directional learning in the library (Monkhouse & Forbes, 2015).

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

YouTube was established primarily to enable library users to share personal objects, experiences and observations with colleagues (Kietzmann, Hermkens, McCarthy & Silvestre, 2011).

- **Social Networking Sites:** This allow library users to connect by creating personal information profiles, inviting friends and colleagues to have access to their profiles and sending messages (Kaplan & Haenlein, 2010). SNSs have achieved phenomenal success since the launch of six-degrees.com in 1997 (Kent, 2008). According to Statista 1.4 billion people used social networking sites around the globe in 2012; by 2016, this number will grow to an estimated 2.13 billion. While Facebook remains the dominant platform with just over 1.5 billion registered users many other platforms and apps have considerable audiences. Created in 2004, Facebook according to NOIPolls (2016) is the most popular SNS in Nigeria. To join Facebook, a user had to have a harvard.edu email address. Beginning in September 2005, Facebook expanded to include high school students, professionals inside corporate networks, and, eventually, everyone. The change to open signup did not mean that new users could easily access users in closed networks—gaining access to corporate networks still required the appropriate dotcom address, while gaining access to high school networks required administrator approval (Boyd and Ellison, 2007). Facebook allows each user to create a profile, updating it with personal information such as home address, mobile phone number, interests, religious views, and even data like relationship status. In addition to creating individual profiles, Facebook users can also "designate other users as friends, send private messages," join groups, post and/or tag pictures and leave comments on these pictures as well as on either a group's or an individual's wall (Grossecka et al., 2011). Other SNSs include Pinterest (a site where the user can "pin" the things he/she likes in a particular category to create a "board" to group them all together, for example, future research ideas) and Instagram (a site dedicated to taking pictures and allowing them to tell an entire story) allow members to instantly see the creativity of a friend and can help the user to brainstorm new ideas.
- **Virtual Game Worlds:** This enable the library to fulfill its role of providing relaxation to users. In virtual game worlds users are usually required to follow strict rules that govern their behaviour (Kaplan & Haenlein, 2009). Many multi-player worlds are intrinsically associated with the role-playing game genre, inspired in its computerised format by the tabletop role-playing games; "you" as player inhabit the body of a character, your avatar, through whose eyes you see the world (Klastrup, 2003; Kaplan & Haenlein, 2009) .The primary goal of virtual game worlds users is to improve the "stats" (statistics of health, stamina) and skills (dexterity, intelligence, fighting skills with sword, arrow) of library users.

USE SOCIAL MEDIA IN LIBRARIES BY UNDERGRADUATES

Utilization of social media is the extent to which social media are utilized in different formats to obtain vital information that will satisfy specific information needs of users (Makinde et al, 2017). Social media allows users to create personal profiles, while connecting with other users of the sites. Users can upload photographs and post what they are doing at any given time (Pempek, Yermolayeva, and Calvert, 2008). Social media is generally used on a regular basis by millions of people across the globe for different reasons. In February 2017, Statistica.com publish a statistic of information on the most popular social media sites used by teenage and young adult users in the united states. During the survey period, it was found that 79% of the respondents mostly use snapshot, 76% use facebook, 73% use Instagram,

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

40% use Twitter, 31% use Pinterest, 16% use Tumbir, 15% use Whatsapp, 11% use Musical.ly, and 9% use LinkedIn.

Currently, studies revealed that young people especially university/college students' use social media. McLoughlin and Lee (2008) asserted that online social networks allowed learners to access peers, experts, and the wider community in ways that enable reflective, self-directed learning. Joinson (2008) provided a list of factors that motivate people to join online social networks that included social connection, shared identities, content, social investigating, social network surfing, and status updating. Similarly, Kimberly, Charles, Nicole, Sittie, Gemeile and Ikka (2009) argued that the involvement of a student in activities such as making friends on online social networks should be seen as a way of having access to up-to-date information that can be channeled towards improving academic performance which they described as how students cope with or accomplish different tasks given to them by their teachers. Santos, Hammond, Durli and Chou (2009) studied students in Singapore and Brazil and discovered that most Brazilian students used online social networks to socialize and discuss their studies while the Singaporean students used them for social interactions only.

Kanelechi, Nwangwa, Ebun and Omotere (2014) found that undergraduates are often referred to as "Net Generation" students (those born between 1980 and 1989) consumed approximately 9 hours of social media per day with most of them using social network sites (SNS) with Blogging and Microblogging tools (Rosen, 2011, Cabral, 2011). Prensky (2001) describes them as heavily involved in computer games, email, the Internet, cell phones and instant messaging as parts of their lives. This group of students functions best when networked and they prefer games to "serious" work. The "I Generation" (those born between 1990 and 1999) even consume more time on social media particularly on chatting platforms such as Facebook Chat, 2GO and Google Chat than they do with their friends Face-to-Face. These two 'generations' spend more time on social media than the "Generation X" (those born between 1965 and 1979) who spend approximately from 20 minutes to 3 hours on social media (Rosen, 2011). This implied that, most undergraduates running full time programmes in Nigerian universities spend more time on social media than any other activity of the day, including academic work. Besides, several web statistics testify that large proportion of young people check their Facebook when they first wake up even before going to the bathroom (www.qbeemedia.com/facts). In order words, as students become addicted to social media, it split their attention, causing massive decrease in knowledge retention (Junco & Cotten, 2012).

Mehmood and Taswir (2013) found that students use social media for: downloading/uploading music/video, posting photos, chatting, blogging, creating polls/quizzes, submitting articles to website and communication with teachers/class. Thus, while the first three are basically for entertainment purposes, the last three however, are for academic purposes. This shows that students use social media for entertainment mostly and less for educational purposes; while most students used social networks for entertainment purposes. Helou and Ab.rahim (2014) also found that students use social networking sites for making friends, receiving and sending messages, chatting with friends, playing games, sharing files, and communicating with supervisors or lecturers. Onyeka *et al* (2013) found that students use social networking sites so as to: keep in touch with others; while away time; maintain a sense of belonging; and to solve social problems. Similarly, Ezeah *et al* (2013) found that Nigerian students use social media to watch movies, pornography and for discussion of serious national issues like politics, economy and religion. Eke *et al* (2014) found that students use SNSs for communicating and interacting with friends; online learning; finding friends online; leisure and personal socialization; searching for job; academic discussion and getting study partners online; watching movies; connecting and interacting with busi-

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

ness partners; communicating, mobilizing and organizing national issues like politics, economy and religious matters; updating profile information. Rosen (2009) confirmed that social media is part and parcel of youth life today. Lin (2010) found that majority of college students in the United States used SNSs at least one hour a day. Ahamed and Qazi (2011) in a study of 6 universities in Pakistan, found that majority of the students spent 1-3 hours daily on social networking sites. Tham (2011) in a study conducted at St. Cloud State University in Minnesota found that, while both males and females spent time spent on SNSs, the said time however, decreased as the age of the respondents increased and the results revealed that female college students spent more time on SNSs than male students. Jagero and Muriithi (2013) in the context of students in private universities in Dar Es Salaam, Tanzania, found that a majority of the students spent 30 minutes to 1 hr daily on social networking sites. In Nigeria, Onyeka *et al* (2013) found that majority of university students in Adamawa State spent 2-4 hours daily on social networking sites, while Anjugu (2013) in a study of students of the University of Abuja found that: "92 respondents (70.8%) spend 6 hours online, 30 respondents (23.1%) spend 4 hours online, 6 respondents (4.6%) spend 2 hours online, and 2 respondents (1.5%) spend 1 hour online". Akubugwo and Burke (2013) found that many students use social media especially Facebook, Myspace, and Twitter during academic classes. Social media negatively impact on the students' academic performance. Asemah *et al* (2013) found that social media has a negative effect on the academic performance of Nigerian students in that students: spend more time on social media than reading their books; rely on social media to do their assignments without consulting other sources; who spend more time on social media are likely to perform poorly in their academic activities than those who do not. Iorliam and Ode (2014) found that the time spent on social media, the frequency of visit and the total number of online friends has a statistically significant relationship with a student's academic performance. Ahmed & Qazi (2011) found a *positive* relationship between use of internet/social media and the academic performance of student users. Thus, students using internet were found to score higher on reading skills test and had higher grades. Pasek, Kenski, Romer and Jamieson (2006) found that Facebook users score higher grades. Social networking sites have even been found to provide a rich mean of interaction between teachers and students (Roblyer, McDaniel, Webb,Herman & Witty, 2010). Mehmood and Taswir (2013) found positive effects of social media on the academics of students.

Eke, Omekwu and Odoh (2014) surveyed 150 students and found that the students use the SNSs to communicate with friends; watch movies; discuss national issues like politics, economy and religious matters; and for academic purposes which particularly is relevant to their academic pursuit. Lamanauskas et al (2013) found that the most important function of social media use by respondents from all countries they surveyed were communication, learning and exchanging information. A similar study by Mehmood and Taswir (2013) revealed that of the 80 percent students who reported that they used a social networking site on phone and that the smart features available on social networks like reading RSS feeds, location tagging and status updates were popular uses of social network on mobile phone. However these were not directly related to their educational pursuit. Alhazmi and Rahman (2013) found that the student's use social media to keep in touch with friends, to let others know what is happening in their life, communicate with friends on classwork, sharing of news and other issues and these do not relate to their academic goals. Ebele and Oghentega (2014) found that undergraduates do not use social media for academic purposes but mainly for general information that are not relevant to academics.

Similarly, Ezeah, Asogwa and Edogor (2013) found that students in South-East Nigeria use social media partly because of the pleasure and fun they derive from the pornographic contents and watching movies using the social media. Okundia (2016) found that students use social media in pursuing activi-

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

ties that do not have bearing with their academics. In a similar study to ascertain the purpose students use social media. Al-Sharqi, Hashim, and Kutbi (2015) found that students use social media tools for a blend of academic and non-academic purposes. And that a significant number of students use social media for entertainment, information searching and learning. Owusu-Acheaw and Larson (2015) found that student use social media to chat than academic purpose. Buhari and Ashara (2014) found that social media is used to connect; interact; share information and chat with friends.

BENEFITS OF SOCIAL MEDIA TO UNDERGRADUATE STUDENTS

Oghenetega and Ejedafiru (2014) stated that social media have affected communication between people in educational community positively since the past decades. Life is made easy by media in different areas such as academically, socially, and politically for any that is connected to it. Social media not only helps to acquire knowledge but also establishing enduring relationships with real people, connecting with fellow dorm residents through Facebook, Twitter and various social sites can help a student overcome the kind of isolation that otherwise might lead her to leave school. What makes social networking websites unique is not that they allow individuals to meet strangers, but rather that they enable users to articulate and make visible their social networks. While Social media have implemented a wide variety of technical features, their backbone consists of visible profiles that display an articulated list of Friends who are also users of the system. Profiles are unique pages where one can "type oneself into being" . A Twitter account can provide a shy student with information about events that facilitates face-to-face encounters with other students. Such personal interactions are vital to creating and sustaining a sense of belonging.

The strength of social media applications is that they offer an assortment of tools that learners can mix and match to best suit their individual learning styles and increase their academic success. The social networking sites focus heavily on building online communities with common interests or activities. Social networking sites also can help students develop leadership skills, from low-level planning and organizing to activities that promote social change and democratic engagement. social media tools and networking sites encourage students to engage with each other and to express and share their creativity. Courtney (2007) enumerated the following as the beneficial impact of Social Media to students:

1. Google and education: Google has helped over 20 million student in their education using their tools. The internet (Google) is a valuable source of information for students looking for ideas for projects and assignments. With over 50 million web sites on the net the chances are that any information however obscure can be found. The only tools required to find this information would be some patience and a decent search engine (Ehrmann, 1995; Adebiyi et al., 2015). Furthermore it has been widely acknowledged that Google has been at the apex and fore at providing resource to information needs.
2. By spending so much time working with new technologies: students develop more familiarity with computers and other electronic devices.
3. With the increased focus on technology in education and business, this will help students build skills that will aid them throughout their lives.
4. Talents got discovered faster, students who were good at programming got their name out their easily, student who were good in music, got their videos out and shared leading them to their dreams.

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

5. A lot of the students were able to inform public about their issues – using social media which brought awareness and helped solve a lot of problems.
6. The ease with which a student can customize their profile makes them more aware of basic aspects of design and layout that are not often taught in schools.
7. The ease and speed with which users can upload pictures, videos or stories has resulted in a greater amount of sharing of creative works. Being able to get instant feedback from friends and family on their creative outlets helps students refine and develop their artistic abilities and can provide much needed confidence or help them decide what career path they may want to pursue.

Oyeboade (2017) asserted that social media affect academic performance of undergraduates because academic successes greatly influence student's self-esteem, motivation, and perseverance in higher education. Social networking sites (facebook) have transformed the ways users interact socially and have shaped communication, research, assignments, and relationships in unique ways. Furthermore, this redefinition has fostered the creation of ''virtual society''(Adebiyi et al., 2015). Courtney (2007) enumerated the consequences of social media to includes popularity of social media, and the speed at which information is published, has created a lax attitude towards proper spelling and grammar. The social media reduces a student's ability to effectively write without relying on a computer's spell check feature.

- Many students rely on the accessibility of information on social media and the web to provide answers. This reduces focus on learning and retaining information.
- ability to retain information has decreased, and the willingness to spend more time researching and looking up good information has reduced, due the fact we got used to the ease of accessibility to information on social media.
- The more time students spend on social sites, the less time they spend socializing in person. Because of the lack of body signals and other nonverbal cues, like tone and inflection, social networking sites are not an adequate replacement for face-to-face communication. Students who spend a great deal of time on social networking are less able to effectively communicate in person.
- The degree to which private information is available online and the anonymity the internet seems to provide has made students forget the need to filter the information they post. Many colleges and potential employers investigate an applicant's social networking profiles before granting acceptance or interviews. Most students don't constantly evaluate the content they're publishing online, which can bring about negative consequences months or years down the road.
- Students are having a harder time getting to communicate face to face with people, and are losing their people skills, due to that they are spending more and more time talking from behind a screen.

According to (Blogger, 2012) the negative effects of these social media networking site seem to apparently overweigh the positive ones. Researchers indicate that these sites have caused some potential harm to the society. The students become victims of social networks more often than anyone else. This is because when Blogger, further explained that other negative effects of social networking websites include: Reduced learning and research capabilities- Students seem to rely more on the information accessible easily on these Social Media Networking Site and the web. This reduces their learning and research capabilities because some of them smuggle their phone into the exam hall to get answers to exam questions which sometimes becomes impossible and leads to exam failure. Multitasking- Students who get involved in activities on social media sites while studying, get their focus of attention reduced,

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

this results in lack of concentration to study well and consequently poor academic performance. Moreover, the more time the students spend on these social media sites, the less time they spend socializing personally with others. This reduces their communication skills or lack of the ability to communicate and socialize effectively in person with others. The effective communication skills are key to success in the real world. Reduces command over language usage and creative writing skills. Students mostly use slang words or shortened forms of words on social networking sites. They start relying on the computer grammar and spelling check features. This reduces their command over the language and their creative writing skills. Many Nigerian students lost interest in reading because they are addicted to social media networking site, while some hardworking students became lazy as a result of bad company on social media networking site, these Nigerian students were introduced to Examination malpractice (exam runz) at social media networking site. This has however, contributed to lowering of Nigeria education standard in the form of numerous certified illiterates in Nigeria (Penkraft, 2015). A research carried out by Oyewumi, Isaiah and Adigun (2015) revealed that excessive and uncontrolled or compulsive social networking use has been known to have negative effects on psychological well-being of adolescents, such as loneliness.

The value of interactive social media technologies in high institutions of learning is now recognized in the way that teaching and learning strategies is in an increasingly globalized process (Gray, Chang & Kennedy, 2010). One of the most commonly cited benefits of social media by scholars is their ability to facilitate collaborative learning and communication among peers and with people outside academia (Collins & Hide, 2010; Rowlands, Nicholas, Russell, Canty & Watkinson, 2011). Other than communication, scholarly Twitter users cite information distribution among the primary advantages of social networking and have proven to become popular especially in academic conferences (Letierce, Passant, Breslin & Decker, 2010; Ross, Terras, Warwick & Welsh, 2011). Another frequently reported advantage of social networking is its remarkable ability to facilitate information distribution. Among the examples include blogging tools which are used by many students to disseminate information within their area, their peers and also to everyone globally (Bukvova, Kalb & Schoop, 2010; Luzon, 2009). The basic advantage of using social media to aid learning and teaching and this can be achieved with the existence of rules and regulations (Rutherford, 2010).

Impact of Social Media on Undergraduate Academic Performance

The term impact can be either negative or positive. It is generally agreed that social media has both positive and negative effects on the academic performance of students globally:

- Positive effects: Eke *et al* (2014) has noted the following positive impacts of social media on the academics of students:
  - *Web Engagement*: In a word where online engagement is important for businesses, students are becoming experts at developing a sense of internet presence. Not only do they know how to interact with others on the internet, they know how to use basic and even complex functions in order to do so. Thus, students use social networking sites to interact with their peers and even teachers about class-related subjects.
  - *Informal Knowledge and Skill*: Social Networking sites can facilitate learning and skill development outside formal learning environments by supporting peer- to peer learning, skills collaboration and diverse cultural expression. The knowledge and skill young people are

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

learning through SNSs are directly relevant to the 'participatory web' in which 'user generated content is now integral in a rapidly developing online business model that capitalizes on the social networks, creativity and knowledge of its users; and this means that new business models are expected to emerge.

- *Education*: Social networking sites help in schools and universities programmes. Such social networking sites for example, blogs help to leverage or complement formal educational activities and enhancing outcomes. SNSs are also used to extend opportunities for formal learning across geographical contexts. Thus, social media can enhance the interactions of marginalized young people with their teacher and increase their confidence in educational activities.
- *Individual Identify and Self-Expression*: Because SNSs are essentially flexible and designed to promote individual customization, they are used to experiment as well as find legitimacy for their political, cultural or sexual identity. Social networking sites can provide users with a space to work out identity and status, make sense of cultural cues, negotiate public life and increase user's sense of personal belonging. This sense of personal belonging and identity has been positively correlated with academic performance.
- *Strengthening Interpersonal Relationships*: generally, studies have found that having positive interpersonal relationships is an important predictor of wellbeing. Social media by and large, has been found to strengthen individual interpersonal relationships. Email, instant messaging and social networking can address new barriers people may face to forming and maintaining public places together, limited transport to get there, and time free of structured activities such as school and sport.

- Negative effects: Social media has been noted to have some negative effects on students' academics:
  - *Displacement effect on academic activities*: since majority of students use social networking sites socializing purposes, they therefore tend to spend more time for socializing rather than learning. Thus, excessive use of SNSs reduces student's academic performance since time meant for studies is used on non-academic issues like chatting and making friends (Salvation &Adzharuddin 2014).
  - *Psychological disorders and health problems*: anxiety, depression, poor eating habits, and lack of physical exercise; increasingly short attention spans and subverted higher-order reasoning skills such as concentration, persistence, and analytical reasoning among frequent users of social media; a tendency to overestimate one's ability to multi-task and manage projects; and technology being seen as a substitute for the analytical reasoning process. Collectively, these play roles in a student's educational process to various degrees and at various times (Blogger, 2012).

Academic performance is used interchangeably with academic achievement which refers to "a successful accomplishment or performance in a particular subject area. It is indicated as by grades, marks and scores of descriptive commentaries. It includes how pupils deal with their studies and how they cope with or accomplish different tasks given to them by their teachers in a fixed time or academic year" (Adane, 2013). According to Adimora (2016) achievement is accomplishing whatever goals one set for oneself. Academic achievement is the overall academic performance of a student in the school which could be assessed by the use of tests and examinations. It is the attainment of standard of academic excellence. Students' academic achievement plays an important role in producing the best quality graduates who

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

will become great leaders and manpower for the country thus responsible for the country's economic and social development (Ali, Jusoff, Ali, Mokhtar & Salamt, 2009). Ask (2015) explained academic achievement as student's success in meeting short- or long-term goals in education. In the big picture, academic achievement means completing high school or earning a college degree. In a given semester, high academic achievement places a student on the honor roll. Teachers and school administrators can measure students' academic achievement through school-wide standardized tests, state-specific achievement tests and classroom assessment. Standardized and state tests enable educational professionals to see how students in a school are achieving in a variety of subjects compared to those at other schools and geographic locations. Classroom assessments enable teachers to see how well students are learning concepts for a specific class (Ask, 2015). This study would look at academic performance as measured from the angle of grades or Cumulative Grade Point Average (CGPA).

Social media is one of the fastest ways information been send and receive timely but it has cause some negative impact to those addicted to it. According to Oyeboade, J.A (2017) postulated that social media by their nature have the capabilities of educating, informing, entertaining and inflaming the audience above all, they possess a contagious and outreaching influence which the conventional media lack. Social media use by undergraduate students reflect more on their academic grades, a study released by Ohio State University reveals that college students who utilize Facebook spend less time on studying and have lower grades than students who do not use the popular social media (Kalpidou, Costin, and Morris, 2011). Cao & Hong, (2011) and Dahlstrom (2012) are of the opinion that Integrating social media for both entertainment and learning is common among students in higher level of education. College students use various social media applications to the extent that it is now an indispensable part of their everyday life for personal and learning purposes. Studies have proved that most students invest time and efforts on social networks in building relationships around on shared interests and on same grounds (Maloney, 2007).

In a study conducted on Social Network Addiction among Youths in Nigeria, Ajewole, Olowu, and Fasola (2012), concluded that majority of the respondents spend more time on social media, which affects their academic productivity negatively. According to Penkraft (2015) Social Media Networking Sites were not aimed to decrease the academic performance of students, but rather to be used for academic purposes. The enthusiasm of Nigerian students for Social Media Networking Site is one of the causes of their poor academic performance. Most Nigerian students prefer to exhaust all their time online chatting at their lesson period, they do not even have time to do their home work as well as read for examinations. These activities have a negatively tremendous influence on their academic achievement. Adimora et al (2016) revealed that students engage more in distracting social networking than to academic activities. To affirm this assertion, Blogger (2012) pointed out that when students are searching for their course material online; in order to kill the boredom in their study time, they get attracted to these sites which divert their attention from their study, such distraction makes them forget their major reason of using internet. As the case may be, the waste of time sometimes makes them unable to deliver their work in the specified time frame and consequently leads to their low grades in their school work.

Adimora's et al (2016) study revealed that a negative and weak relationship between students' social networking and their academic achievement. Blogger (2012) stated that students who get involved in activities on social media networking site while studying, get their focus of attention reduced, this results in lack of concentration to study well and reduction in their academic performance. The study of Adimora et al (2016) also found that neither students' masculinity nor femininity on the use of social networking predicts their academic achievement. Issa, Isaias and Kommers (2016) found that social media network-

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

ing site such as facebook, Pinterest and instagram as popular with females, and that overall females subscribe to online social network platforms to a greater extent than men, and that Nigerian males were more likely to use online social media for academic pursuits as compared to females who prefer using it for pleasure. Ebele & Oghenetega (2014) found that undergraduates in the four universities perform poorly in academic because of addiction with social media activities. These findings showed that social media cause low performance among Nigeria students. The direct link between social media usage and students' academic performance has been the focus of extensive literature during the last two decades (Aghaunor & Ekuobase, 2015). Results of available studies indicate that while some students use social media for socializing, others might use it for learning activities thus enhancing academic performance. Although social media is a very helpful tool in students' hands, it was found by many studies that a negative impact of social media usage on academic performance could occur (Maqableh, Rajab, Quteshat, Masa'deh, Khatib & Karajeh, *2015)*. Social media users devote lesser time to their studies in comparison to nonusers do and subsequently get lower GPAs (Kirschner & Karpinski, 2010). Results of a study by Hasnain, Nasreen and Ijaz (2015) indicated that the usage of social media has an inverse relationship with academic performance of students. This implies that the more students spend time on social media, the more their GPA is affected. According to Khan and Balasubramanian (2009), social media users often time experience poor performance academically. In a study to find out the direct consequences of ICT in Nigeria Universities, Enikuomehin (2011) surveyed 1,860 Facebook users from the Lagos State University and found that 90 percent of the students could not get up to cumulative grade point. average (CGPA) above 3.50 because they had spent a large part of their time on social media than on their homework and study time that could have contributed to the attainment of higher grade. Similarly, Englander, Terregrossa & Wang (2010) posit that social media is negatively associated with academic performance of student and is a lot more momentous than its advantages.

Griffith and Liyanage, (2008) found that support from instant messaging, wikis, blogs, discussion boards, and other Web 2.0 facilities can complement what is taught in a traditional classroom setting. Also, Boyd and Ellison, (2007) assert that the copy and paste practices on MySpace serves as a form of literacy involving social and technical skills. Whereas according to Pasek, More and Hargittai (2009) the use of Facebook has a positive relationship with academic performance. In another study, Haseena and Rasith (2016) conducted a survey of 200 students among the students of Eastern University, Sri Lanka. Their findings concluded that there is a significant positive relationship between social media usage and academic performance. Indicating that if the students spend more time on social media it will help the students to easily discuss about the study task, assignment and exams. When the time spending on social media is increasing it will also increase the performance of the students. Findings from a survey of 932 students of Kaduna Polytechnic by Buhari and Ashara (2014) revealed that students perceived social media usage as something interesting that they can use to improve their academic performances.

However, the overuse of these sites on a daily basis seems to have many negative effects on the physical and psychological health of students, because it makes them lethargic and unmotivated to create contact with the people in person. An excessive use of these sites could be detrimental to these students' psychological health (Blogger, 2012). According to About.com (2006) psychological health is a mental state of someone who is functioning at a satisfactory level of emotional and behavioural adjustment. It may also include an individual's ability to enjoy life, and create a balance between life activities and efforts to achieve psychological resilience. World Health Organization (WHO) explained mental health as subjective well-being, perceived self-efficacy, autonomy, competence, intergenerational dependence, and self-actualization of one's intellectual and emotional potential (World health report, 2001). WHO further

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

states that the well-being of an individual is encompassed in the realization of their abilities, coping with normal stresses of life, productive work and contribution to their community (Mental health, 2014).

Adane (2013) noted four groups of factors that influence the academic achievement of students: home-related factors, school-related factors, student characteristics and teacher-side factors. Similarly, Salvation and Adzharuddin (2014), while conceding that students' "academic performance is multi-dimensional construct", however opined that it consists of three dimensions: student's characteristics, teacher/lecturer's competencies and academic environment.

CHALLENGES THAT AFFECT THE USE OF SOCIAL MEDIA BY UNDERGRADUATE STUDENTS IN THE LIBRARIES

There are challenges that affect the use of social media for educational purposes. It has been reported that one of the problems associated with using social networking sites for scientific studies is the possibility of students spending a lot of time on them and denying other important aspects the time they deserve (Rowlands et al., 2011). Rithika and Selvarag (2013) stated that social media can increase student learning through student interactions, challenges arise when social media are incorporated into an academic course.

The assumption that students are familiar with and agreeable to using certain types of social media can cause educators to inadvertently fail to provide the resources or encouragement necessary to support student usage and learning. When social media is used for an educational purpose, students incorporate the technology into their lives in a way that may differ from the intentions of the course instructor. For example, off-topic or non-academic discussions occur on social media because of its primary design as a social networking tool. Further, as a student's age increases, the frequency of off-topic discussions also increases (Rowlands et al., 2011). This indicates that while social media may encourage broader discussions of course content, older students may spend more time than younger students engaging in unrelated discussions.

Conn and Brady (2008) and Griffith and Liyanage (2008) highlighted the reasons for students use of social networking sites in educational environments to include preconceptions associated with exposing students to inappropriate online content, fears of online sexual predators, and student-based cyber bullying, or online student harassment. Lederer (2012) stated that the challenges of social media included distraction that divert learner's attention from classroom participation and finally are disruptive to the learning process. The second challenge is that cyber bullying can be used as a weapon for malicious behaviour. Lastly, social media discourages face-to-face communication. Jones et al (2012) found that five challenges of social software for learning included separation of life and studying; originality and copyright issues; sense of information flooded; time constraint and lecturers are not up-to-date and may not know how to integrate and make use of social software.

Farkus, George, et al. (2012) asserted that the challenges associated with use of Social Networking Sites stem from the risks inherent in student internet usage. Internet exposes students to inappropriate material, unwanted adult interactions, and bullying from peers. Keen (2007) also affirms that the quality of content is also a major concern. Ngonidzashe (2013) indicated that the major challenges or concerns relating to social networking technologies are loss of control as one can receive unsolicited negative comments, time commitment and information overload.

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

Scholars have conducted several studies on the use of social media in libraries and impact on undergraduates both within and outside Nigeria. Most of these studies concentrated on the types, purpose; utilization and effect of social networking sites on academic achievements, of students. In a related study, Hasnain, Nasreen and Ijaz (2015) studied impact of social media usage on academic performance of university students. The study adopted survey research design using stratified random sampling to select 191 students from four private universities. Questionnaire was used to collect data and data was analyzed using frequency counts and simple percentage while the hypothesis was tested using linear regression analysis. Findings revealed that usage of social media has an inverse relationship with academic performance of students.

Similarly, Owusu-Acheaw and Larson (2015) studied students' use of social media and its effect on academic performance of tertiary institutions students in Ghana with a focus on Koforidua Polytechnic students. The study adopted survey research design using stratified random sampling technique to sample a total number of 1508 students. Questionnaire was used as the data collection instrument and the results were analyzed with the use of the Statistical Package for Social Science (SPSS) and the result shown in tables with corresponding frequencies and percentage. The study revealed that majority of the respondents had mobile phones which also had Internet facility on them and had knowledge of the existence of many media sites. The study further confirmed that most of the respondents visit their social media sites using their phones and spend between thirty minutes to three hours per day. In addition the study revealed that the use of social media sites had affected academic performance of the respondents negatively and that there was direct relationship between the use of social media sites and academic performance

Youssef and Alobaidy (2016) investigated the impact of social networking sites on student academic performance: The Case of University of Bahrain. Survey research method was adopted and a structured questionnaire was used to collect data. A total of six hundred twenty eight (628) students were sampled. Data was analyzed using Statistical Package for Social Sciences (SPSS). The result revealed that SNS have positive and negative impacts on student academic performance. At the end, the authors came up with fruitful recommendations on how to get benefit from the SNS to improve the learning process.

Irshad (2012) evaluated the Social Media trends among University Students in Islamia University of Bahawalpur, Pakistan. Survey research method was adopted and a structured questionnaire was used to collect data. A total of six hundred (600) students were sampled using convenient sampling technique. Data was analyzed using MS-Excel Programme. The result revealed that students used face-book for exchanging academic activities and developing social networks throughout the world. Social media was also used for sharing learning experiences with colleagues and international community. Social media was used to promote collaboration and linkage in developing Virtual Community across the world. The problems of social media included bandwidth of internet and electricity break down/ load shedding.

In a related study, Knight-McCord, Cleary, Grant, Herron, Jumbo, Lacey, Livingston, Robinson, Smith and Emanuel (2016) studied social media sites that college students use most in co-educational university in southeastern, Alabama State, United State of America. Survey research method was adopted and a structured questionnaire was used to collect data. A total of three hundred and sixty three (363) college students were sampled. Data was analyzed using descriptive statistics and mean statistics. The result revealed that Instagram was the most used social networking site followed by Snapchat and Facebook. Students used social networking sites that enable them to post pictures and videos. They least use social networking sites that enable them to develop a professional network or post media content into organized categories. Social media sites are increasingly tailored to meet the needs of specific target

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

markets. Understanding this evolutionary pattern is the key that unlocks which social media platforms college students will continue to use most.

In a similar study Omekwu, Eke and Odoh studied the Use of Social Networking Sites among Undergraduate Students of University of Nigeria, Nsukka. Survey research method was adopted and a structured questionnaire was used to collect data. A total of one hundred and fifty (150) undergraduate students were sampled using convenient sampling technique. Data was analyzed using random sampling techniques. The result revealed that student were using the social networking sites in interaction with friends, connecting to their class mates for online study and for discussing serious national issues and watching movies etc. There are also laudable benefits of using social networking sites and dangers associated with social networking and such dangers can be ameliorated using the strategies available in the work. Drawn from the findings, it was recommended that university Authorities should organize seminars to enlighten students on the not-so good aspects of social networking sites etc. In addition useful suggestions for further research were equally made.

Kanelechi, Nwangwa, Yonlonfoun and Omotere (2014) examined undergraduates and use of Social Media: Assessing Influence on Research Skills in six different universities randomly selected from six geo-political zones in Nigeria. Survey research method was adopted and a structured questionnaire was used to collect data. A total of six hundred (600) students were sampled using purposive sampling technique. Data was analysed using descriptive analysis and frequency and Chi-square (X^2) was used to test null hypothesis in the study. The result revealed that undergraduates frequently copy from Wikipedia as their major source of information; uses Facebook to generate ideas from colleagues about their research focus; and make use of Wordpress or Blogger to develop their creative writing skills. However, students' reliance on these social media tools alone has resulted in their dwindling research skills to produce quality research works. Recommendations were made on how to improve students' research skills.

Osharive (2015) studied the influence of Social Media and Academic Performance Of students in University of Lagos, Nigeria. Survey research method was adopted and a structured questionnaire was used to collect data. A total of three hundred and seventy eight (378) students were sampled using random sampling technique. Data was analyzed using descriptive analysis and frequency and Chi-square (X^2) was used to test null hypothesis in the study. The result revealed that students were addicted to social media. Recommendations were made on the use of social media for educational purposes as well; Social Networking Sites should be expanded and new pages should be created to enhance academic activities and avoid setbacks in the students' academic performance; and Students should be monitored by teachers and parents on how they use these sites This is to create a balance between social media and academic activities of students to avoid setbacks in the academic performance of the students

In a similar study, Onuoha and Shaeed (2011) studied perceived influence of online social networks on academic performance: a study of undergraduates in selected universities in Ogun State, Nigeria. Descriptive survey research method was adopted and a structured questionnaire was used to collect data. A total of four hundred and two (402) students were sampled. Data was analyzed using descriptive analysis and frequency and percentage counts. The result revealed that majority of the respondents used online social networks was used for social interaction than academic purposes. Most of the respondents, however, agreed that the use of online social networks have positive influence on their academic performance.

Olajide and Oyenira (2014) studied the knowledge and use of social media among Nigerian Librarians in twenty-six different tertiary institutions (Universities, Polytechnics, Colleges of Education, school of nursing in south west Nigeria. Descriptive research design was adopted and a structured questionnaire was used to collect data. A total of Two hundred (200) librarians were sampled using random sampling

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

technique. Data was analyzed using descriptive analysis and frequency and Statistical Package for Social Sciences (SPSS) version 20. The result revealed that about half of the Librarians are yet to have in-depth knowledge of SM; Facebook is the still the most common while Skype, Twitter, and LinkedIn were not very popular among them. Facebook is also the mostly used SM, the duration spent on SM weekly is small and the major hardware used is phone and personal laptops. The usual place of accessing SM address is the Library/office. Majority of the Librarians have 2 SM account and the major uses are chatting and gisting. Uploading, reading of blogs or posting of other people and asking of questions have a low response. Recommendations were made as to improve on the knowledge and use of SM among Librarians in Nigeria.

CONCLUSION

Social media have a positive impact on academic performance of undergraduates and there is a direct relationship between Social media usage and academic performance of students. Therefore, Undergraduate students should be enlightened and encouraged to develop habits of using social media platforms for positive academic purposes and to complement their studies. The review presented a general overview of social media where the types of social media in various formats were highlighted. Literatures on the following concepts were also reviewed: concepts of utilization of social media; benefits, impact and challenges that affect the use of social media and academic performance of undergraduate students. The concepts generally implied that social media is the use of technology as the best medium to explore wide area of knowledge to produce positive impact on academic performance of students.

RECOMMENDATION

The following recommendations are made as follows:

1. awareness programmes of use of social media platforms should be provided by the university and library to students.
2. access to use of social media resources and services by librarians should be provided to students.
3. educational forums that will facilitate group collaboration and discussion on academic performance should be promoted in universities.
4. connectivity to social media network sites and internet should be improved to facilitate instant information search by students.
5. provision of equipments such as computers, printers, scanners and photocopiers should be made available to students.
6. training on information search skills should be given to students by librarians to ensure properly utilized of social media resources.
7. adequate funding should be provided by parent institutions for subscription to social media sites

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

REFERENCES

Adane, L. O. (2013). *Factors affecting low academic achievement of pupils in Kemp Methodist Junior High School in Aburi, Eastern Region* (Master's thesis). University of Ghana, Legon. Retrieved from http://ugspace.ug.edu.gh

Adenubi, O. S., Olalekan, Y. S., Afolabi, A. A., & Opeoluwa, A. S. (2013). Online Social Networking and the Academic Achievement of University Students – The experience of selected Nigerian Universities. *Information and Knowledge Management, 3*(5). Retrieved from: www.iiste.org

Adimora, D. E., Ngwuchukwu, M. N., & Onuoha, J. C. (2016). Prevalence of social media networking on academic achievement and psychological health of undergraduate students in Federal Universities in Nigeria. *Global Journal of Psychology Research*: *New Trends and Issues*, *6*(3), 135–147.

Aghaunor, C. T., & Ekuobase, G. O. (2015). ICT social services and students' academic performance. A Multidisciplinary Journal Publication of the Faculty of Science, Adeleke University, Ede, Nigeria, 2, 29-46.

Ahmed, I., & Qazi, T. F. (2011). A look out for academic impacts of Social networking sites (SNSs): A student based perspective. *African Journal of Business Management*, *5*(12), 5022–5031.

Boyd, D. (2006). A Blogger's Blog: Exploring the Definition of a Medium. *Reconstruction, 6*(4). Retrieved from http://reconstruction.eserver.org/064/boyd.shtml

Boyd, D. M., & Ellison, N. B. (2007). *Social network sites: definition, history, and scholarship*. Academic Press.

Bruns, A. (2008). *Blogs, Wikipedia, Second life, and Beyond: from production to produsage*. Academic Press.

Bryer, T., & Zavattaro, S. (2011). Social media and public administration: Theoretical dimensions and introduction to symposium. *Administrative Theory & Praxis*, *33*(3), 327.

Buhari, S. R., & Ashara, B. H. (2014). Use of social media among students of Nigerian polytechnic. *International Conference on Communication, Media, Technology and Design*, 302-305.

Cao, Y., & Hong, P. (2011). Antecedents and consequences of social media utilization in college teaching: A proposed model with mixed-methods investigation. *On the Horizon*, *19*(4), 297–306. doi:10.1108/10748121111179420

Choney, S. (2010). *Facebook Use Can Lower Grades by 20 Percent, Study Says*. Retrieved from http://www.msnbc.com/id/39038581/ns.technology_and_science-tech_and_gadgets/.Retrieved

Chukwuemeka, O. (2013). Environmental influence on academic performance of secondary school students in Port Harcourt Local Government Area of Rivers State. *Journal of Economics and Sustainable Development*, *4*(12), 34–38.

Conn, K., & Brady, K. P. (2008). Myspace and its relatives: The cyberbullying dilemma. *West's Education Law Reporter*, 1-7. Available at http://www.webcitation.org/5hGReihs

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

Courtney, N. (2007). *Library 2.0 and beyond: Innovative technologies and tomorrow's user*. Westport, CT: Libraries Unlimited.

Dahlstrom, E. (2012). *ECAR study of undergraduate students and information technology*. Louisville, CO: EDUCAUSE Center for Applied Research.

Daluba, N. E., & Maxwell, C.E.O. (2013). *Effect of social media on the use of academic library by undergraduate*. Academic Press.

Kanelechi,, C.K., Nwangwa, E. Y., & Omotere, T. (2014). Undergraduates and Their Use of Social Media: Assessing Influence on Research Skills. *Universal Journal of Educational Research*, *2*(6), 446–453.

Owusu-Acheaw, M., & Larson, A. G. (2015). Use of Social Media and its Impact on Academic Performance ofTertiary Institution Students: A Study of Students of Koforidua Polytechnic, Ghana. *Journal of Education and Practice*, *6*(6). Available at www.iiste.org

Oyeboade, J. A. (2017). Socio-economic status, peer pressure and use of social media by undergraduate students in university of Ibadan, Ibadan, Oyo State, Nigeria. *Library Philosophy and Practice,* 1495. Retrieved http://digitalcommons.unl.edu/libphilprac/1495

Pasek, J., More, E., & Hargittai, E. (2009). Facebook and academic performance: Reconciling a media sensation with data. *First Monday*, *14*(5). doi:10.5210/fm.v14i5.2498

Peluchette, J., & Karl, K. (2008). Social networking profiles: An examination of student attitudes regarding use and appropriateness of content. *Cyberpsychology & Behavior*.

Peter, O. (2015). *Social Media and Academic Performance of Students in University of Lagos. Being a research project submitted to the department of educational administration, faculty of education*. University of Lagos.

Pew Research Centre. (2017). Which social media platforms are most popular. *Internet, Science Computer-Mediated Communication, 13*(1). Retrieved http:jcin.indiana.edu/vol13/issue1/boyd.ellison.html

Rithika, M., & Selvaraj, S. (2013). Impact of social media on student's academic performance. *International Journal of Logistics & Supply Chain Management Perspectives*, *2*(4), 636–640.

Rowlands, I., Nicholas, D., Russell, B., Canty, N., & Watkinson, A. (2011). Social media use in the research workflow. *Learned Publishing*, *24*(3), 183–195. doi:10.1087/20110306

Salvation, M., & Adzharuddin, N. A. (2014, August). The influence of social network sites (SNS) upon academic performance of Malaysian students. *International Journal of Humanities and Social Science*, *4*(10[1]), 131–137.

Santos, I., Hammond, M., Durli, Z., & Chou, S. Y. (2009). Is there a role for social networking sites in education? In A. Tatnall & A. Jones (Eds.), *Education and technology for a better world. Proceedings of the 9th IFIP TC 3 World Conference on Computers in Education* (pp. 321–330). Berlin, Germany: Springer. 10.1007/978-3-642-03115-1_34

Statista. (2017). *World report on social media usage*. Retrieved from http://www.statista.com/statistics/272014/global-social-networks-ranked-by-number-of-users/

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

The World Health Report. (2001). *Mental Health: New Understanding, New Hope*. Retrieved from: https://en.wikipedia.org/wiki/Mental_health

Wang, Chen, & Liang. (2011). *The Effects of Social Media on College Students*. The Alan Shawn Feinstein Graduate School. Providence, RI: Johnson & Wales University.

Wasko, M. M. L., Teigland, R., & Faray, S. (2009). The Provision of Online Public Goods: Examining Social Structure in an Electronic Network of Practice. *Decision Support Systems*, *47*(3), 254–265. doi:10.1016/j.dss.2009.02.012

KEY TERMS AND DEFINITIONS

Academic Performance: In this study, it refers to level of performance in written works and exams. How students deal with their studies and how they cope with or accomplish different tasks given to them by their teachers, within this work measured from the standpoint of academic grades.

ICT: In this study, it refers to information and communications technology (or technologies) that is the infrastructure and components that enable modern computing.

Internet: In this study, it refers to global computer network providing a variety of information and communication facilities, consisting of interconnected networks using standardized communication protocols.

Social Media: In this study it refers to different types of communication technologies that facilitate social interaction and collaboration between people. This includes Facebook, blog, Twitter, wiki, instant messaging, etc.

Social Media Usage: In this study, it refers to **t**he amount of time spent on social media.

Undergraduates: In this study, it refers to students who are studying for first degree (usually entitled Bachelor of Arts [BA] or Bachelor of Science [Bsc] in a university).

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

Chapter 19
Application of Mobile Technologies in Library Service Delivery

Oluwatoyin Oyeyemi Obinyan
Ambrose Alli University, Nigeria

ABSTRACT

With the rapid advancement in technology in the last two decades, mainly because of the advent of the internet, the world no longer works the same. The advent of wireless networks and more recently mobile devices such as smart phones, tablets, etc. following the internet, contributed a lot their applicability in library's operations. As contained in extant literature, mobile devices have become a very important part of communication not only for telephone service users but also for the internet users. The two main reasons behind success of mobile technology is the benefits such as mobility and ubiquity served by mobile devices. To this end, the chapter explores the application of mobile technology on service delivery in libraries, the advantages and disadvantages. Also highlighted were the skills required by the librarians in incorporating mobile technologies to library services.

INTRODUCTION

Good and ethical orientation gives birth to positive ideas which can lead to transformation of the community and her environment (Adedeji, Aderibigbe and Onyibor, 2003). Such transformation over the years has led to discoveries and technological inventions of which computers, internet and mobile devices or technologies are one. With continuous creative research and invention, internet came into being with unique flexibility that arose from end-to-end design hailed by Lessig (2000) cited by Sawhney and Lee (2005) as the architecture of innovation. Guided by the end-to-end principle as enunciated by Sawhney and Lee (2005) citing David (2001), the designers of the Internet sought to keep the core network 'dumb' and place the intelligence at the end users. The network was reduced to a delivery system that merely routed packets from one point to another, application development was left to the users or the 'ends'. This open design, which allowed for the emergence of unanticipated applications such as email and the

DOI: 10.4018/978-1-5225-9034-7.ch019

Copyright © 2020, IGI Global. Copying or distributing in print or electronic forms without written permission of IGI Global is prohibited.

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

World Wide Web, gives the fringe group opportunities to conjure up new modes of communication that continue to surprise us.

There is no gainsaying the fact that advancement in technology as it relates to the internet has continue to astound the world which no longer works the same as a result. Friedman (1995) argued that globalization in the 21st century is like no other, because technology empower people in an unprecedented way. The advent of wireless networks and more recently mobile devices such as smart phones, tablets, etc. following the internet, contributed a lot to make mobile technology come into existence (Neupane, 2012). According to Neji (2014), mobile technology hold great promise for enabling libraries to provide enhanced services. In the thinking of Neupane (2012) earlier stated that today mobile phones are becoming an integral part of everyday life and are changing the way one connects and interacts with the world. In this changing scenario, Mobile Technology will be of great help to libraries towards strengthening their relationship and providing enhanced user oriented services to existing users. Computer technology has created a revolution with new advances, new ideas and new users for machines that once were considered useful for handful of tasks and industries. Thus with the scope and ubiquity of computer technology libraries and librarians need to remember that effective and relevant library services are driven by user needs.

This submission calls for a rethink for libraries and librarians in the twenty first Century globalizing world. This coupled with the recorded monumental transformation in information and communication technologies comes the challenge(s) of the adoption of mobile technologies to remodel the age long services libraries have been known to provide users. To improve and democratize access to information from basic research and applied research brought about in contemporary times by the growing use of mobile technologies/ICT calls for epistemic review of library schools' curricula. In this connection, LIS profession must be able to make significant and recognizable footprints in the digital environment while adequately meeting information needs of users. In addition, the hypertextuality of the Internet as Miltra (2005) had argued, makes the empowerment of the twenty first library and information science practitioners particularly significant for developing countries.

To this end, Obinyan's (2014) developmental trajectory model could be use to underpin the widespread use and deployment of mobile technologies to empower and assist library and information science professionals in developing countries to seamlessly integrate their traditional value adding professional knowledge into the provision of library services to users seeking information for development in a globalizing world. This in essence is to intensify the importance and serviceability of the library line of work far beyond the twenty first century. Without prevarication, mobile technology will be of great help to libraries and provide enhanced user experience. Creative application of mobile technologies to library services is a significant step in the direction of ensuring robust user experience and satisfaction; particularly so as libraries nowadays are functioning in a user centered, technology based atmosphere, providing individualized value services (Roy & Kumar, 2017) mobilizing library content in a portable form suitable for small screen.

Seeholzer and Salem (2011) also add that students expressed more interest in using their mobile devices to interact with library sources and services than expected. They wanted to use their smartphones for searching databases and the library catalogue, as well as staying informed by the library staff. California Digital Library (2010) found out that mobile users use the library services to find known materials or quick pieces of information and they were already using online databases and catalogues on their mobile devices. Respondents were in favour of accessing the library catalogue from mobile phones in addition

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

to accessing information such as library opening hours, location, contact information and borrowing record. Such mobile library services were therefore recommended for implementation.

LIBRARY SERVICES

The traditional library services are now moving to mobile library information services. Library services refer to the services which are provided by a library for the use of books or any other form of document and dissemination of information to fulfil library users' information requirements. The well-known traditional library services include cataloguing, classification, circulation services, reservation, renewal, new arrivals, current contents, current awareness service, selective dissemination of information, indexing and abstracting, reference service, document delivery, interlibrary loan, externally purchased database, provision of access to CD-ROM databases, access to other library catalogues, access to online databases, internally published newsletters,, reports and journals, bibliographic services, and so on. These are all traditional services.

WEB BASED LIBRARY SERVICES

Library services provided using Internet as medium and library website as a gateway with the help of integrated library management system and other web 2.0 tools are known as Web enabled information services. From the users' point of view, web-based library services fall into such category as: Current awareness service, SDI service, Online delivery service, Documentation delivery service, CD-ROM service, Internet access, Indexing and abstracting databases, Library portal service, Federated search, Alert service, Digital library services, Web OPAC service and a Virtual library of links to other useful resources. Due to the emerging technologies many new trends can be seen in the field of libraries. With these new trends, libraries have changed from:

- Printed collection to Web based publishing like digital collection
- Reference desks service to Online/Virtual Reference Service
- Closed Access to anytime/ anywhere access of material through internet libraries
- Manual indexing and Bibliographies to Full Text Databases
- Manual Library Catalogue to OPAC (Online Public Access Catalogue) / Web OPAC
- Manual sharing of information to Networking of Libraries
- Inter-Library Loan Service to Electronic Delivery of Information

From the enumerated services, the impact of ICT on libraries and the adoption of mobile technologies to remodel library services are clear and identifiable. Till date, mobile technology use has changed the every aspect of library operations such as acquisition, processing, storage, retrieval and dissemination of information. The growth of information, ICT use inclusive of mobile technologies has brought a revolution in the field of librarianship and library operations or services. Also significantly changed are the ways and manners people think and communicate with one another.

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

MOBILE TECHNOLOGIES

Mobile technology is exactly what the name indicates – technology that is portable; it refers to any device that you can carry with you to perform a wide variety of "tasks. Mobile technology has been recognized as the single most embraced technology in the world. Statistics has shown that mobile technologies users have grown to more than 70% of the world population.

Mobile Technology is a technology that allows transmission of data, voice and video via a computer or any other wireless enabled device without having to be connected to a fixed physical link. The main components of mobile technologies are mobile software, mobile hardware and mobile network Mobile devices such as smart phones, iPod, PDA's, netbook, tablet computers, gaming devices, notebooks, tablets, personal digital assistants (PDAs), handheld computers, hi definition televisions (HDTVs) and cell phones to access, locate, convert, and disseminate library information resources, services, and instructions via the next generation internet and broadband wireless services.. Mobile technologies facilitate and provide the platform for information dissemination and retrieval by the use of mobile devices such as smartphones, tablets, netbooks and laptops (Liu & Briggs, 2015; Little, 2011) and e-readers which have affected the lives of people by changing the manner in which communication is done. Ocran, (2017) while quoting CILIP recalls the use of mobile devices to access the internet overtook the use of desktop for the same purpose. M-Libraries offer the opportunity for the expansion of existing library-based services into the mobile domain.

Examples of Mobile Technologies Devices Used in Libraries Are:

- Laptop and netbook computers
- Palmtop computers or personal digital assistants
- Mobile Phones and Smart Phones
- Global positioning system (GPS) devices
- Ipods and MP3 players
- Tablets

Mobile devices can be enabled to use a variety of communications technologies such as:

- Wireless fidelity (Wi-Fi)- a type of wireless local area network technology
- Bluetooth- Connects mobile devices wirelessly
- 'Third generation' (3G), global system for mobile communications (GSM) and
  - general packet radio service (GPRS) data services- data networking services for
  - mobile phones
- Dial-up services- data networking services using modems and telephone lines.

Mobile Library Service

Mobile devices which include smartphones, iPads and the likes of tablet computers and other smart devices are gaining grounds and increasingly proliferating in society in general and the academic environment in particular, contributing immensely in the way information is handled; thus, organized, received and disseminated. It is for this reason that academic libraries must adopt mobile services which will lever-

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

age significant innovation with regards to technological changes. Kumbhar and Pawar (2014) recount the digital journey of libraries as having transformed from traditional libraries to hybrid libraries, and then to automated libraries, which have also developed further due to digital archiving, Library 2.0 and mobile technology services.

Kumbhar and Pawar (2014) assert that mobile technologies have introduced a "Libraries in hand" trend. They suggest that since libraries are currently creating digital contents accessible on computers, such digital collections could be made available on mobile platforms. According to them Short Message Services or text facilities have often been relied upon by academic libraries to publicize their products and services such as new arrivals, due dates and renewals among others. The consideration to make library services available on mobile platforms has gained recognition both in literature and in practice by virtue of the benefits it brings. The mobile initiative comes along with its interactive capabilities, easy access to information, time saving, personalized services, user participation as well as limitless access.

Needham and Ally (2008) are of the opinion that with the advent of mobile technology, mobile library has been coined to refer to all the information services that mobile devices offer. These include access to online catalogues, user suggested apps downloadable e-books, audio materials, access to databases, text notification and text references (Kroski, 2008). Library services must quickly and flexibly adapt to mobile culture (Goggin, 2006). The value of smartphone as tool has been recognized and advocated by Starkweather and Stowers, (2009); Little, (2011) and Jensen, (2010) to enable users of the library to access library services. One example of these library services has to do with text-a-Librarian services which are seen as a very effective means and ways of satisfying client needs quickly and in a more convenient way.

Libraries especially academic libraries are coming up with strategies for designing mobile technology-based services so as to meet the ever changing sophistication that characterizes their information needs and requirements of their patrons (Lippincott, 2010; Vila, Galvez and Campos, 2010).

Strategies Adopted in Using Mobile Technologies in Libraries

Mobile Interfaces and Online Public Catalogue

Libraries in their quest to offer Tailor made services are developing and providing access to mobile versions of their OPAC to their clients in other to render timely and without barrier services and resources to their patrons. These services include collections and e-journals as well as time for opening the library (Murray, 2010; Vila, Galvez and Campos, 2010). According to Vila, Galvez and Campos (2010), mobile OPAC (MOPAC) ensures fast and quick retrieval of an item. Paterson and Low (2011) confirmed that 60% of students interviewed opined that it is convenient to search the catalogue anytime and anywhere.

Mobile Collections and Databases

According to Lippincott (2010), database publishers are using innovative strategies for mobile version of their databases for their clients to access both e-books and e-journals via their mobile devices. These databases are said to be mobile friendly as they easily interface with mobile devices (Murray, 2010). These publishers include social science research networks and music online services that provide access to both video and audio recording (McKiernan, 2010). Ebscohost provides a mobile interface for EBSCO products which according Hadro (2009) is considered to be very useful for mobile library platform. Murray (2010) states that e-books readers make it possible to access these databases irrespective of their geographical location.

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

Mobile Instructions and Mobile Tours of the Library

Fresh students who embark on their academic journey each year are introduced to instruction services in the academic library. These services such as library orientation and information literacy are the services libraries provide through mobile devices. Kroski (2008) observed that Youtube can be a best example for library tour videos. Another tool for making mobile instruction services possible is the use of podcast. Murray (2010) and Choy (2010) stated that the content of podcast provides immense benefits to both distance students and those studying abroad. Awareness services such as "Guide by call" and "self-service" library instruction services also contribute to adding value to the services that are already available.

Short Message System Reference

SMS reference is widely known among mobile technology in academic library services. Paterson and Low (2011) opined that this service seeks to provide services to patrons from any location. It allows a library patron to send a text to a librarian with the use of their mobile phones. The librarian can also send a text to patrons by way of alerting them of the availability of new arrivals, reserved books and any other library news (Pearce, Collard & Whatley, 2010). SMS appeals to both librarians and students. In order not to invade the privacy of students, Vila, Galvez and Campos (2010) advised that students be made aware by librarians before a message is sent. Again, they observe that some reference queries go beyond SMS. However, such mobile reference services facilitate and ensure that synchronous reference transaction is performed in the quickest and convenient way.

1. **Mobile Applications**: Some libraries have developed mobile applications for Smartphone's. The District of Columbia Public Library, for example, has developed an iPhone application that includes a mobile OPAC and the ability to place items on hold, and also provides information on hours and locations of local libraries (see http://dclibrarylabs.org/projects/iphone/).
2. **Mobile Collections**: Third-party content providers are partnering with libraries to deliver audio books, e-books, audio language courses, streaming music, films, images, and other multimedia that can be used on mobile devices. The Overdrive service is supported on numerous mobile devices and has developed an application for BlackBerry Smartphone's (see http://www.overdrive.com).
3. **Mobile Library Instruction**: Some libraries are offering library instructional materials and resources via mobile platforms. For example, East Carolina University's "Research First Aid" is a series of podcasts for library researchers on the go (see http://www.ecu.edu/cs-dhs/laupuslibrary/researchfirstaid.cfm).
4. **Mobile Databases**: PubMed for Handhelds is a mobile web portal for the National Library of Medicine (http://pubmedhh.nlm.nih.gov/).
5. **Library Short Message Service (SMS) Notifications**: Many libraries use SMS for a variety of purposes, including notification for items available for pickup, due date reminders, information on availability of library materials, provision of call numbers and locations, and others (see http://cpl.org/?q=node/12258).
6. **SMS Reference**: Some libraries are offering "text-a-librarian" services ideal for simple questions that can be answered with a brief response.
7. **Mobile Web Sites:** Mobile versions of their Web site that are better optimized for viewing on mobile devices; e.g. Encyclopedia Britannica Mobile offers a search box and a list of suggested searches. Results include full-text entries with enlargeable images. MedlinePlus Mobile. Produced

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

by the U.S. National Library of Medicine, MedlinePlus Mobile provides information about specific diseases, conditions, and wellness issues. The site also contains prescription drug information, medical dictionary, and current health news. *Access:* http://m.medlineplus.gov. WorldCat Mobile. Search the WorldCat catalog for books, movies, music, games, and more. Results include items available at local libraries. *Access:* http://www.worldcat.org (Sood & Mukherjee, 2013).

EFFECTS OF MOBILE TECHNOLOGY ON LIBRARY SERVICE DELIVERY

Mobile technology extends computing and the Internet into the wireless medium, and provides greater flexibility in communication, collaboration, and information sharing Virtual private networks- secure access to a private network. Conversely, this technology provides unique learning opportunities and has advantage of portability and mobility. Academic, public and special libraries could use mobile technology in service innovations, m-learning, instruction in mobile device, web lectures, reference services and catalogue searching (Sudhir Ramdas Nagarkar) Accessing digital libraries over mobile devices has the high potential of reaching a broader community of users which will also give rise to issues related to making digital libraries accessible over mobile devices. Mobile technology is altering the way we communicate, teach, learn, entertain ourselves and make decision. Mobile devices today can run complex software allowing user for advanced interactivity and with new hardware and technologies such as Bluetooth, Wi-Fi, global positioning system, mobile websites mobile devices can send and receive information nearly anywhere and anytime. Libraries can serve better by adapting the growing mobile technology offering mobile access to their websites and public access catalogs and by providing mobile access to e-books, journals, video, audio books, and multimedia contents.

These technological advances have altered the more traditional forms of information provided by libraries. With the advent of technology libraries are no longer the way we imagine with books on row upon row in a building with a person sitting in front. The world of library and librarian has changed by digital technology. Digital libraries are collection of documents, artifacts, video, images etc. stored together on a computer in digital form (Neupane, 2012). Technology has changed the fundamental forms of information and the way to find access and use information. As technology evolved, mobile computing has gained increased popularity with widespread use and is on track to replace personal computers (desktop and laptops) as the primary means to access online information and communication. There are the challenges in providing the necessary information to users at the right time. Mobile technologies have made communication and information access very convenient and timely to users. The adoption of mobile technology alters the traditional relationships between libraries and their users and introduces novel challenges to reader privacy. Nowadays, libraries are functioning in a user centered, technology based atmosphere, providing individualized value added services. The International Federation of Library Associations and Institutions released its trend report identifying five trends the association felt might jumpstart discussion of the future of libraries.

These trends were:

1. new technologies will both expand and limit who has access to information;
2. online education will democratize and disrupt global learning;
3. the boundaries of privacy and data protection will be redefined;
4. hyper-connected societies will listen to and empower new voices and groups; and

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

5. the global information economy will be transformed by new technologies

Library-Based Mobile Services

- Alerting services: To send SMS to collect the requested books, reminding the user if, book is due in his/her account; informing user about the exact fine and acknowledging the user about renewal of a book.
- OPAC service i.e. Online library catalogue on mobile
- Library instruction and tour through mobile app
- E-resources with mobile interfaces
- Library Institutions and Virtual tours
- Books and articles search
- Mobile APPs for library
- Current Awareness services
- Selective Dissemination of Information services
- Subject guide/path finders
- Short message service Reference
- Users may request the opening and closing hours of the library.
- News and Events: Information on varieties of scholarly competition, library events such as orientations program, stock verification, book recall, lectures on special topic, news in relation to scholarly work, awards and so on can be given using mobile devices in order to update the user's knowledge
- **Reference Service:** Library users can ask librarians anything through the live chat and texting with mobiles.

Advantages of Mobile Technology in Library Services

- User friendly-Aid
- Personalized Service
- Ability to Access Information seamlessly
- Immediate feedback is also possible from the user's side.
- Time Saving
- User Participation
- Location Awareness
- Limitless Access
- Access to Print-disabled Users

THE MAJOR DRAWBACKS IN MOBILE APPLICATION

Costs involved in setting up the equipment and training required to make use of mobile devices. Mobile IT devices can expose valuable data to unauthorized people if the proper precautions are not taken to ensure that the devices, and the data they can access, are kept safe

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

Librarians Changing Roles and Skills

The digital transition has had a tremendous effect upon librarian's role and the services they provide, The digital transition means that to meet changing faculty and student needs, librarians and library staff need to reposition themselves to operate fluidly in the digital sphere, even if that arena is not completely comfortable to them yet (Lewis, 2016). According to Lili (2006) Academic information services librarians and executives have primary responsibility of designing, developing, enhancing, implementing, and leveraging high quality library user services to satisfy library users' dynamic needs. Furthermore, Hallis (2017) asserted that Librarians have accommodated many of these changes through adapting formats, revising search tools, providing assistance online, and turning to teaching information literacy. In the future, we must shift to informing the search process needed for a particular situation, crossing many traditional boundaries in the process. In this role we prepare our users to engage the larger world of information through preparing them for the journey in much the same way as a naturalist outfits a client for a trip. An outfitter prepares a client for a specific journey by selecting appropriate gear, charting a suitable route, supplying counsel for the journey ahead, and even acting as a guide through the trip.

A librarian provides comparable services through suggesting a route, equipping the user with suitable search tools, suggesting methods of evaluating sources and appropriately using them, and even serving as a model through the process. As libraries have created networks of access through consortia arrangements, providing access to databases, and enlarging electronic access to sources. As Identified in literatures, the role of tomorrow's librarian against some identified ways library patrons will value the librarians of the future; and he describes these "valued roles" in:

- Improving the quality of questions
- Professional consultation
- Professional recommendations
- Experts in copyright compliance, licensing, privacy
- Designing experiences that are scalable and sustainable
- Programme development
- Custom ontologies
- [serving as] Teachers and trainers
- Developing measurements and analytics (pp. 45-46).
    - Librarians should acquire and apply the following skills if they wish to provide mobile-based services: Knowledge of hardware and software of mobile devices (Malathy & Kantha, 2013):
    - Create/tailor mobile-optimized content including interactive and participative library homepages, OPAC, virtual tours, and databases
    - Familiarity with preventing internet/intranet services like using e-mail, SMS and spam, etc.
    - Develop expertise in protecting privacy and security levels as more personalized information is involved in using mobiles for library services
    - Skills related to searching and navigating through mobile devices, mobile web applications like push e-mail, etc.
    - Skills for interacting with users via smart phone applications, mobile-friendly webpages, and third party intermediary clients
    - Skills relating to training and user orientation to market these services to users.

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

CONCLUSION

The aim of using ICT is to enhance efficiency, improve reliability and reduce cost. It has a very positive impact on libraries. The mobile technology is of great help to libraries and provide enhanced user experience, the changes in the society and demand for information utilization have forced the library professionals to look for more effective and efficient methods for processing, storing and retrieving of information. To meet these challenges, librarians and information professionals have applied information technologies in their areas of work. Emerging technologies have affected the libraries in improving housekeeping operations as well as the various user services in so many ways.

REFERENCES

Adedeji, G. M. A., Aderibigbe, M. O., & Onyibor, M. I. S. (2003). *An introduction to philosophy and logic*. Ibadan: Hope Publications.

Bucznski, J. A. (2008). Libraries begin to engage their menacing mobile phone hordes without Shhhhh! *Internet Reference Services Quarterly*, *13*(2-3), 261–269. doi:10.1080/10875300802103916

Decker, E. N. (2017). Encouraging continuous learning for librarians and library staff. *Library Management*, *38*(6/7), 286–293. doi:10.1108/LM-10-2016-0078

Friedman, T. L. (2005). *The World is Flat*. New York: Farrar, Straus and Giroux.

Goggin, G. (2006). *Cell phone culture: mobile technology in everyday life 251*. New York: Routledge.

Jensen, R. B. (2010). Optimizing library content for mobile phones. *Library Hi Tech News*, *27*(2), 6–9. doi:10.1108/07419051011050411

Kroski, E. (2008). On the move with the mobile web: Libraries and mobile technologies. Library Technology Reports, 1-48.

Kumbhar, S., & Pawar, R. (2014). *Mobile based services: Application and challenges*. doi:10.1314/2.1.2373.2000

Lewis, D. W. (2016). *Reimagining the Academic Library*. Lanham, MD: Rowman & Littlefield.

Li, L. L.LiLi. (2006). Leveraging quality web-based library user services in the digital age. *Library Management*, *27*(6/7), 390–400. doi:10.1108/01435120610702387

Lippincott, J. K. (2010). A mobile future for academic libraries. *RSR. Reference Services Review*, *38*(2), 205–213. doi:10.1108/00907321011044981

Little, G. (2011). Keeping moving: Smart phone and mobile technologies in the academic library. *Journal of Academic Librarianship*, *37*(3), 267–269. doi:10.1016/j.acalib.2011.03.004

Liu, Y., & And Briggs, S. (2012). A library in the palm of your hand: Mobile services in top 100 university libraries. *Information Technology and Libraries*, 133–148.

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

Malathy, S., & Kantha, P. (2013). Application of Mobile Technologies to Libraries. *DESIDOC Journal of Library and Information Technology*, *33*(5), 361–366. doi:10.14429/djlit.33.5098

Murray, L. (2010). Libraries like to move it, move it. *RSR. Reference Services Review*, *38*(2), 233–249. doi:10.1108/00907321011045007

Nagarkar, R. S. (2010). Use of mobile technology in library services. *Indian Streams Research Journal*, *3*(11), 1-4.

Needham, G., & Ally, M. E. (2008). *M-Libraries: Libraries on the move to provide virtual access*. London, UK: Facet Publishing.

Ocran, T. K. (2017). Perception of students on mobile technology based library services. *Library Philosophy and Practice,* 1802.

Paterson, L., & Low, B. (2011). Student attitudes towards mobile library services for smartphones. *Library Hi Tech*, *29*(3), 412–423. doi:10.1108/07378831111174387

Roy, M. B., & Kumar, N. (2017). Application of mobile technology in Library services. *International Journal Information Movement*, *2*(7), 168–172.

Sawhney, H., & Lee, S. (2005). Arenas of innovation: Understanding new configurational potentialities of communication technologies. *Media Culture & Society*, *27*(3), 391–414. doi:10.1177/0163443705051750

Sawhney, H., & Lee, S. (2005). Arenas of innovation: Understanding new configurational potentialities of communication technologies. *Media Culture & Society*, *27*(3), 391–414. doi:10.1177/0163443705051750

Sharma, D., & Sahoo, D. R. (2014). Application of Mobile Technology in Library Services: An Overview. *International Journal of Information Technology and Library Science*, *3*(1), 17–24.

Singh, K., & Nikandia, P. K. (2017). Role of mobile technology and application in library services in digital era. *Journal of Library and Information Science*, *7*(1), 2–10.

Smith, B., & Jacobs, M. (2010). Libraries and patrons on the move: From bookmobiles to "m" libraries. *RSR. Reference Services Review*, *38*(2), 21–30. doi:10.1108/rsr.2010.24038baa.002

Sood, S. K., & Mukherjee, I. (2013). Mobile technology in emerging library and information services. *Conference Papers; SPL Annual Convention (NCLTDP-2013),* I 211-I 218.

Starkweather, W., & Stowers, E. (2009). Smartphone: A potential discovery tool - *ProQuest. Information Technology and Libraries*, *28*(4), 187–188. doi:10.6017/ital.v28i4.3231

Trivedi, M., & Suthar, V. (2011). A plan of M-Library for Smt. Hansa Mehta Library: A study. *International Journal of Information and Communication Technology Research*, *1*(3).

Vila, M. C., Galvez, A. P., & Campos, J. C. (2010). Mobile services in the Rector Gabriel Ferrate Library, Technical University of Catalonia. *RSR. Reference Services Review*, *38*(2), 321–334. doi:10.1108/00907321011045070

Vishwakarma, M. L., Maurya, S. L., & Govil, S. (2013). Use of Mobile Technology in Indian Libraries. *International Journal of Engineering and Computer Science*, *2*(6), 1799–1805.

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

Chapter 20
Relevance of Web 2.0 for Library Services in Digital Era

Jane Igie Aba
Ambrose Alli University, Nigeria

Theresa Osasu Makinde
Ambrose Alli University, Nigeria

ABSTRACT

This chapter is on relevance of Web 2.0 for library services in digital era. Web 2.0 tools play crucial role in effective service delivery of librarians. The study covers awareness, utilization, benefits, and challenges that affect the use of Web 2.0 by librarians for effective service delivery. The concepts generally implied that Web 2.0 can be used by librarians as information acquisition tools to gather information from sources outside libraries (e.g., blogs and wikis), information dissemination tools (such as RSS feeds), information organization tools that facilitate storage and subsequent retrieval of information (social bookmarking and tagging), and information sharing tools that facilitate the bilateral flow of information between libraries and patrons (social networking and media sharing sites). This chapter examines the concept of digital libraries and highlights the major features of a digital library and how it can be used. The potentials of digital library are very crucial as means of access to knowledge and information that will facilitate development.

INTRODUCTION

The library has witnessed the rapid transformation in applying information technology and unprecedented change in the mode of rendering library services in the last three decades. Libraries have developed and diversified their services based on advanced information communication technologies. This is due to the way Information and Communication Technologies tools and services have influenced library services. Web 2.0 is a second generation web-based technologies for communication. This Technological advancement offers great opportunities for libraries to reach out to users far beyond the traditional boundaries of physical building. Libraries have been affected by the technological advancement of web 2.0. It is primarily on "user-centeredness" or user-participation Vijayakumar (2010). Library users are

DOI: 10.4018/978-1-5225-9034-7.ch020

Copyright © 2020, IGI Global. Copying or distributing in print or electronic forms without written permission of IGI Global is prohibited.

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

enticed to use library services due to access to web 2.0. Currently, the use of libraries are threatened by Internet and web 2.0 which could be deployed as a strategic marketing tool for libraries. Gobinda Chowdhury (2006) argues that ICT and internet technologies have changed the nature of libraries in all sectors and the perception and expectations of the user community (Chowdhury,2006). The change in perception of library users have restructured the entire concept of libraries and redefined its objectives. These changes are facilitated by the rapid changes in web technologies which have led to significant rise in social networking websites and online applications. This enable like-minded users share resources, create; tag and label content. The web has become useful and creates a vital means of providing learning resources to students. Information dissemination and sharing was previously a one-way means of communicating information to users, but a new wave of the internet technologies and the upgrade of web such as web 2.0 applications users to interact online. Thus, web 2.0 applications such as wikis, Blogs, social bookmarking, YouTube, Podcast, File share etc. has enhance the dissemination of information through multiple means of communication(Christian 2017). The development of web 2.0 technologies has enhanced information communication and technology (ICT) capability by creating new domain where human being can associate with each other with unique properties (Dhar and Sundararajan, 2007). With the use of dynamic web 2.0 over the static web 1.0, people no longer access content only rather they can now access and create collective knowledge via web 2.0 applications. Lee (2010) opines that technology has had the most dramatic influence on the youngest members of society, also known as the millennial generation.

Historically, the term Web 2.0 was coined in 1999 by Darcy DiNucci and was popularized by Tim O'Reilly at the O'Reilly Media Web 2.0 conference in late 2004. (O'Reilly, 2005). The key feature of Web 2.0 is that allows users to interact and collaborate with each other in web space and ensures creation of community knowledge. This feature is a step towards the vision of Sir Tim Berners-Lee, who envisioned the Web as "a collaborative medium, a place where we [could] all meet and read and write" (News, 2005). Web 2.0 is the second generation of Web-based services emphasizing online collaboration and sharing, Web 2.0 is an advancement and modification of Web 1.0. Web 1.0 was known as (READ-ONLY) where internet users went online to find information. Hence, users were only allowed to read without making input. This is similar to the use of library to locate books and other informational materials. Web 2.0 is defined as the collective set of Internet-based tools such as wikis, blogs, web-based applications, social networking sites etc (Boateng, Mbtika and Thomas 2010). Web 2.0 is regarded as (READ/WRITE) zone where educators have become active participants and content creators. They not only find information on the internet, but they also create and shared content (Thompson, 2007).

Consequently, the browser has been transformed from a space where users passively retrieved information to a participatory, knowledge sharing social networking and collaboration users created content and folksonomy (Brown and Adler, 2008; Thompson, 2007; Richardson, 2009). Web 2.0 is a collective term for series of web-based technologies that include blogging and micro-blogging platforms, wikis, twitter, flickr, media-sharing sites, podcasting, content aggregators, social networks, social book-marking sites and other forms of participatory and social media. Web 2.0 applications enable learners develop critical thinking skills and provide opportunity to regularly compare their contributions to those of their peers; and the affirmation of their relative standing in the class may be powerfully motivated for learning (Hurlburt, 2008). Technological education deals with the application of critical thinking (cognitive domain) and the psychomotor domain and the application of Web 2.0 relevant in teaching and learning in tertiary institutions in Edo state. The innovation of Web 2.0 provides numerous opportunities for social interac-

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

tions and collaboration among students, teachers, subject matter experts, and professionals in different fields as well as a host of others with related interests (Hartshorne and Ajjan, 2009; Vygotsky, 1978).

Awareness is defined as knowledge or perception of a situation or fact. It can be said that awareness is the ability to directly know and perceive, to feel or to be cognizant of information. It allows us to take sensory information in and make it into something meaningful (Wikipedia). Awareness of web 2.0 is the recognition and interpretation of web 2.0 applications. It is the conscious understanding of web 2.0 applications. It is very clear that Web 2.0 is changing all aspects of academic life of institutions, hospitals; libraries, publishers, e-learning vendors, search engines and media etc. various sectors are implementing Web 2.0 technologies to serve the need of "digital natives" and "digital immigrants" (Vijayakumar, 2010).

The utilization of web 2.0 applications refers to the practical and effective applications of web 2.0 for services currently, the internet has facilitated the search and retrieval of information and end-users have become information-independent. Maloney (2007) opines that with the use of Web 2.0, users no longer access the web only for specific actions, such as accessing the content; instead they access and create collective knowledge through social interactions. Educators suggest that Web 2.0 tools should be integrated into higher education as "Digital natives" expect to learn with new technologies and as such prepare them for future workplace. Voigt (2008) stated that web 2.0 promotes student-centered learning and enhanced capacity of users.

Web 2.0 applications can be utilized by libraries in the areas of blogs or weblogs, RSS; instant messaging, social networking; podcasts, photo-sharing; mashups and others (Bradley, 2007). For, instance, Ohio University library and University of Alberta are using RSS feeds to announce arrivals of new books (Farkas, 2007). Heriot Watt University Library also launched their blog in 2006 and was linked to the library website. The blog contained news, views, information and advice from the Library (Kelly, 2008). The Portsmouth City Library (UK) is using Wikis to engage their readers through customized services such as wiki for book lovers and readers, and sharing experiences through reviews and recommendations. There is also 'teen wiki' to support the teenagers reading groups in Portsmouth.

TRADITIONAL LIBRARIES

Traditional library according to Sutton (1998) is a specific place with finite collections of tangible information and it is geographically constrained. This library operates within the four walls of a building and it compels users to visit the location before accessing its resources. The collections of traditional libraries include books, manuscripts, journals, maps, encyclopedia, dictionaries, newspapers, periodicals and other sources of recorded information. Thus, the collections of traditional libraries are mostly print media. The collections are not easily located and users do not make maximum use of them as expected. Chermick (2001) enumerates the services of traditional library to include inter-library loan, reservation services, current awareness services, user education, information literacy programs, provision of seats and study facilities, exhibition and display. These services are very minimal and localized compared to the last 50 years, where libraries have increasingly developed into a provider of information resources and services that do not require a building. The table below shows the distinctions between traditional and digital libraries.

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

DIGITAL VERSUS TRADITIONAL LIBRARIES

See Table 1.

Automated Library

According to Nok (2006), automation is the automatic, as opposed to human, operation of process, equipment, or system, or techniques and equipment used to achieve this. In libraries, automation refers to functions such as circulation, cataloguing, or acquisitions. Nwalo (2003) posited that library automation involves full application of computers in library routines hitherto manually performed. Automated library has machine-readable catalog, computerized acquisition, circulation and online public access catalog (OPAC) and the holdings of this library are similar to traditional library.

Electronic Library

This is an automated library that uses Local Area Network (LAN), Compact Disk Read Only Memory (CD-ROM) networking to acquire both print and electronic resources. The electronic media are used for storage, retrieval and information Delivery.

Digital Library

The terms `electronic library`, `cybrary`, `virtual library` are often used synonymously and interchangeably. Virtual library connotes a library without boundaries. According to Omekwu (2002), virtual libraries are libraries without walls that depend on virtual reality of technology. Virtual library is an integrated library system that merges electronic resources. Todd (2000) also referred to virtual library as the technology which creates an information environment that is complete and fluid, connective and interactive, diverse and unpredictable, where professional provision is no longer constrained by time and place.

According to Harter (1996), digital library can be referred to as an organized collection of documented information resources (texts, numeric, images, statistics sound software, etc.), not limited by physical structure and printed format, but also includes electronically stored information and information resources accessed physically and remotely irrespective of time and location of user and/or information resources with the use of information and communication technology. The digital library is an improvement of electronic library. It uses high speed optical fiber for Local Area Networking (LAN) to access Wireless Area Network (WAN) and provide a wide range of Internet-based services such as audio and

Table 1.

Library Services	Traditional Library	Digital Library
Opening Hours	Limited	Round-the-clock, all year round (24/7)
Remote Access	Not possible	Possible
Multiple Access	Not Flexible	Easy and cheap
Access to Resources	Limited to shelf search in physical location	Instant and electronic
Search Engines	Manual and tedious	Easy and electronic, extensive

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

video conferencing. Majority of the resources of digital library is in computer readable form and also acts as a point of access to other online sources (Dimkpa & Umah, 2013).

Similarly, Tennat (1999) asserted that electronic library can be virtual library so long as they exist only virtually, that is in real life. Electronic library is a library that has collection in digital forms such as CD-ROMs, online etc and provides services over cables and telecommunication lines.

Hybrid Library

This can be defined as the library that encompasses print and electronic formats brought together in an integrated information service, accessed via a combination of local and remote electronic gateways (HyLiFe Programme, 2001). It includes print information sources and electronic sources. Hybrid library has been viewed as a transitional stage in a progression from physical to wholly digital libraries: a stage which is likely to last for a considerable period because of the cost of conversion from prints (Brophy, 2001). It can neither be fully print nor fully digital. The University of Queensland Library uses the term *Cybrary* to describe the integration of cyberspace and physical space.

FEATURES OF DIGITAL LIBRARIES

The basic features of digital libraries include the followings:

1. By nature, it is not fixed in the way that text is printed on paper
2. Digital texts are neither final nor limited resources. They are neither fixed in essence nor in form except when a hard copy is printed and can easily be changed or erased.
3. Flexibility is one of the main assets of digital information and is precise
4. It is easy to edit, reformat and print
5. It helps to create an endless number of identical copies from a digital file because the file does not decay by virtue of copying.
6. It supports multimedia components
7. It provides access to large documents
8. It supports and provides search and retrieval interface
9. It overcomes distance barrier through remote accessing of rare and expensive materials
10. It provides a powerful user-friendly interface for effective searching and retrieval.

OBJECTIVE OF DIGITAL LIBRARIES

The following are objectives of digital libraries:

- To provide fast and effective library operations
- To capture, store, manipulate and distribute information
- To provide fast and efficient access with multiple access mode
- To maintain cost effectiveness of library services
- To provide quick access to bibliographic as well as full text information

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

- To subscribe and access electronic journal across the globe
- To digitize documents for preservation and for space saving
- To avoid routine and redundant activities
- To save the time of both librarians and users

FUNCTIONS OF DIGITAL LIBRARIES

The main functions of digital libraries are similar to that of traditional libraries such as to identify, select, process, organize, provide access, preserve and manage collections. Digital libraries deal with documents in digital form and digital environment by using modern information communication technologies to manage digital collections. Singh (2011) summarized the following as some the functions of digital libraries:

1. **Storage Management:** This refers to the process of organizing and managing digital contents to ensure availability to users. To also provide reliable storage and management of data in an open access environment.
2. **Search and Access:** To provide quick access to bibliographic as well as full text information to users.
3. **Distribution:** To provide fast and efficient access with multiple access mode through existing networks, client/severs or the Internet.
4. **Right Management:** To provide access and control by enabling content owners protect their copyright.

BENEFITS/MERITS OF DIGITAL LIBRARIES

The major advantage of digital libraries includes the following:

1. Ease of accessibility: users have remote access to library collections anywhere in the world instantaneously.
2. Digital materials can be stored, transmitted and retrieved easily and quickly.
3. Access to electronic information is cheaper than its print counterpart when all files are stored in an electronic warehouse with compatible facilities and equipment.
4. Digital texts can be linked and made interactive to enhance retrieval of more information.
5. It alleviates the problem of poor storage environment normally associated with traditional library services.
6. The resources will never be out on loan and will be available at any time, place and anywhere
7. Technical services, cost of tracking arrival of journal issue, claiming and periodical binding will be eliminated

As observed by Campbell (2006:17), "numerous creative and useful services have evolved within academic libraries in the digital age: providing quality learning spaces, creating metadata, offering virtual reference services, teaching information literacy, choosing resources and managing resource licenses, collecting and digitizing archival materials, and maintaining digital repositories".

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

CONCEPT OF WEB 2.0 TOOLS

There are lots of relevant and useful literatures on conceptual definitions of the concepts involved in this study such as: web 2.0 resources; types, awareness; use, and challenges that affect the use of web 2.0 resources for research. Thus, web 2.0 is a term encompassing Web 2.0 that allow users to interact and collaborate with each other in web space and ensures creation of community knowledge (O'Reilly, 2005). The term Web 2.0 refers to the second generation and second phase of web evolution that allows collaboration, interaction and sharing of information among users. Web 2.0 an improvement on the less dynamic and rigid Web 1.0 which was developed in the 1990 and characterized by the use of static web pages, essentially read-only pages for visitors as one way communication. Wilson, Lin, Longstreet & Sarker (2011) referred to web 2.0 as the second generation of the Web, wherein interoperable, user-centered web applications and services promote social connectedness, media and information sharing, user-created content, and collaboration among individuals and organizations. San Murugesan (2014) states that Web 2.0 is the wisdom Web, people-centric Web, participative Web, and read/write Web. Web 2.0 harnesses the Web in a more interactive and collaborative manner, emphasizing peers' social interaction and collective intelligence, and presents new opportunities for leveraging the Web and engaging its users more effectively. Boateng, Mbtika & Thomas (2010) affirmed that Web 2.0 is a set of trends and tools for using the internet. It is a socio-technological innovation that enabled interactivity and gathering of knowledge through experience and practice on a global scale. Makori (2012) states that it is a second generation web-based services that include social networking sites (such as, Facebook, YouTube, My Space, Flickr, and Twitter) and support systems (online help desk) that allows online collaboration, participation, sharing of information and communication services. It is a platform that assists information professionals to provide services to patrons and researchers.

The concept of web 2.0 has brought collaborative work, social networking and the ease of usage of these applications. Vijayakumar (2010) describe web 2.0 as the changing face of people's activities on the web, from a mere place to access and read information towards a much cool place to create/write/share/collaborate/network with intellectual involvement. Besides, the library can be visited (virtually) and followed by both local and distant users. Chau & Goh (2010) opines that Web 2.0 has the potential to promote participatory networking where librarians and users can communicate, collaborate, and generate content. Furthermore, Virkus & Bamigbola (2011) notes that Web 2.0 tools can be perceived as means of chatting, talking and sending messages to family members, friends, colleagues and reading their profiles. Anunobi & Ogbonna (2012) found that the motive of Web 2.0 is generating, packaging and disseminating information on the web in the form that is acceptable to individuals, peers and the global community without web technology competences. Consequently, librarians can now overcome the limitations of static web and to enjoy the opportunities provided by web 2.0 for effective library services. Adekunmisi and Odunewu, (2016) opined that the essence of Web 2.0 is to offer collaborative, interactive, more user-friendly and multi-rich services to users by encouraging information generation, packaging and dissemination on the web in new and interesting ways. Zadeh, Veisi & Zadeh (2013) asserted that Web 2.0 tools have brought significant changes not only to the way individual use the World Wide Web, but also the way individuals seek, use and create information in the library. Khan (2013) states that the goal of Web 2.0 is to create a Read/Write Web; that is, a Web in which users can both read and freely contribute content. The primary aim of Web 2.0 is to move away from the traditional unidirectional model, toward a new user-centric bidirectional model.

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

TYPES OF WEB 2.0 TOOLS AVAILABLE FOR LIBRARY SERVICES

Web 2.0 tools can be grouped into the following categories: Real Simple Syndication (RSS) - an XML-based format usually used for content distribution of news and news headlines on a website; blog - a website that usually has a collection of brief posts, articles, essays, photos, or other writings managed by an individual or an organization; Wiki - a tool for the collaborative creation of a community document that is authored, edited, and modified by the collective endeavors of multiple authors; Instant messaging (IM) - IM is an online communication between two or more people using text-based short messages (Boateng & Quan Liu, 2014). Web 2.0 tools and services currently offered by libraries include bookmarking, user-added reviews/rating/summaries, blogs, wikis, RSS (real simple syndication feeds), podcasts, vidcasts, instant messaging, tagging, social networking sites, streaming audio and video, chat, community photo services, community book services, Twitter, reader's advisory, book lists, and maintaining a virtual library in second Life (Tripathi and Kumar, 2010; O'Dell, 2010). Web 2.0 is not restricted to these tools and services, some of the types of Web 2.0 tools are defined in Table 2.

OVERVIEW OF ACADEMIC LIBRARIES IN THE 21ST CENTURY

The 21st century is the millennium of information is an era of explosion of information output and information sources. It is also known as the beginning of knowledge age. New patterns of work and

Table 2. Definitions of Different Web 2.0 Tools

S/N	Web 2.0	Definitions
1.	Wiki	Wiki is a collaborative web site which can be directly edited by anyone with access to it (Wikipedia.org)
	Blog	Blog is a web site, usually maintained by an individual, with regular entries of commentary, descriptions of events, or other material such as graphics or video (Wikipedia.org)
	Instant Messaging (IM)	IM is a live online communication synchronous channel which facilitates online interaction between two parties
	Real Simple Syndication (RSS)	RSS is lightweight XML format which is used for publishing frequently updated content such as blog entries, news headlines, and podcasts in a standardized format (Geoghegan and Klass, 2005)
	Social Networking Sites (SNS)	Social Networking Sites are web-based services such as Facebook, Twitter, MySpace, Skype, etc. with hundreds of millions of users which allow subscribers to create web spaces where they can share their thoughts, music, videos and pictures (Geoghegan and Klass, 2005)
	Del.icio.us	Allows users to bookmark favorite sites and to share those bookmarks with others
	Podcast /streaming video and content	Podcasts are audio contents available on the internet that can be automatically delivered to a personal computer or MP3 player (Geoghegan and Klass, 2005)
	YouTube	Allows members to upload videos for everybody to see and vote on their popularity (Downes, 2005).
	Flickr	Allows for photo collecting, tagging, and distribution services (Downes, 2005).

Source: Baro, Idiodi and Godfrey (2013) Level of Awareness and Use of Web 2.0 Tools by Librarians in University Libraries in Nigeria. OCLC Systems & Services Vol. (29):3 170-188

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

new business practices have developed as a result; new kinds of work with new and different skills are required. In this century, the meaning of knowledge has changed. Knowledge is no longer what is stored in the minds of experts, represented in books and classified in disciplines. Libraries exist to support its academic community and it curriculum; hence their development is always tied to development of the institution where they are found. Libraries have prominent role to play in supporting higher education to fulfill objectives of its parent institution. Students in higher education are to be provided with the facilities needed to achieve their information need for whatever purpose. According to Okomanyi (2016) academic library is the focal point around which serious and intense intellectual development and scholarship are birthed. It is a critical component, as well as indispensable instrument of intellectual, cultural and socio-economic symbolic and mutually beneficial relationship that exists between the academic library and the academic community. The academic library is indispensable, as it will best served when the it is well stocked to serve as the store house of information which users could resort to for data or information. Okomanyi (2016) cited Terplan, (2000) argued that for centuries, academic libraries have been playing critical and important roles in supporting research in all subjects and disciplines within their host universities and colleges Aina (2004) opined that the main purpose of academic library is to support the objectives of an academic environment in the areas of learning, teaching, research and services.

CHANGING USERS NEEDS

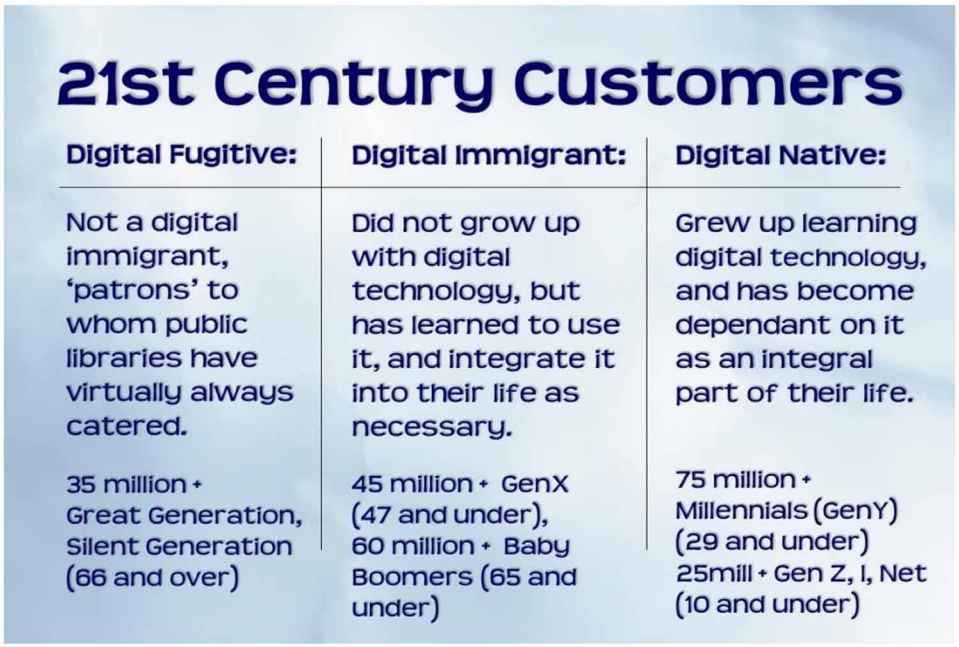
User's information needs are influenced by the rapid changes in ICTs. With the advent of technology users are familiar with latest trends in information environments and this has led to major impetus for change in libraries. Library users have high expectations from the librarians than before to access the right information and knowledge in the right format and at the right time from wherever they are (Jain, 2013). In the past libraries had only one type of traditional users, who had no other choice but to come to libraries. According to Matthews (2011), in twenty-first century academic library users can be grouped into major three categories as shown in the diagram below:

The diagram above displayed users from diverse background and librarians has to satisfy all their information needs according to their levels. Similarly, various terms have been used to denote ways of imparting knowledge on how library users can effectively utilize library resources. Some of the terms includes: reader instruction, user instruction, library orientation, library instruction, use of library, library and information skill, user and staff education, information literacy and so on. Though, these terms are used interchangeably, what is common is that, they refer to formal and informal library programmes of educating and enlightening users on how to maximally utilize library resources.

The 21st century has also witnessed a dramatic change in users' information seeking pattern and are gradually changing to fit into their clients' information seeking patterns. Academic libraries have been dramatically changed and this change is driven by the advent of web 2.0, the concept of book oriented librarianship has long been taken over by users centered librarianship which web 2.0 brings, this is another drive behind change in 21st century academic libraries. Web 2.0 is the use of digital media, including Internet and mobile, for collaborating to create user generated content and form self organizing communities. Web 2.0 is designed to collaborate, exchange ideas and achieve commonly-shared goals. Examples of web 2.0 are blogs, forums, wikis, social networking sites, micro blogging sites,

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

Figure 1. Types of Customers in 21st Century Libraries
Source: Matthews (2011)



social bookmarking sites, social voting sites, social review sites, MySpace, LinkedIn and virtual worlds (HLWIKI International, 2013). Academic librarians are using them to collaborate with library users. For example, as a pedagogical tool, web 2.0 tools can be used as a means of communication among librarians and library communities such as faculty members and students to provide discussion forums on subject-related topics and current awareness, for creating OPML packages for library patrons, for subject guides, for RSS feeds from the ILS, for new books feeds, search feeds, feeds of checked-out books and holds. Universities are now creating podcast initiatives through iTunes U, most well-known educational Podcasting service (Medscape News, 2011).

Khan & Bhatti (2012) social media provides more opportunity to reach your community, target specific audiences, and give them a chance to interact with your library. By using social media, libraries can engage their clients on issues of interest and enable them make inputs especially as it affects library services. This can improve the library's image. Academic librarian can provide effective library services through mobile telephones like the GSM (Global Systems for Mobile Communication). In support of teaching and research, the use of SMS (Short Message Services) can be employed to answer reference queries and alert users on new arrivals and upcoming events in the university calendar. For instance, public holidays, university matriculation, lecture free week etc. This could be flashed through a facility called broadcast where one text message is sent to all the library contacts listed in the address book on the mobile phone at once. (Iwhiwhu, Ruteyan and Eghwubare, 2010).Web 2.0 technologies have transformed the way people view the library and how information industries engage with their clients, collaborate on projects, promote their services and gather community knowledge, made it possible for people to actually connect to one another through the internet and have brought new roles for library and library

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

AWARENESS OF WEB 2.0 BY LIBRARIANS FOR LIBRARY SERVICES DELIVERY

Awareness is the act of being knowledgeable or familiar about item(s) or facilities in an environment at a given period of time (Makinde et al, 2017). The goal of web 2.0 tools will not be fully realized if librarians are not initially aware of the tools and services rendered. To effectively perform their duties, the operations of web 2.0 tools will largely depend on awareness and use of its resources by its users, otherwise, the resources and services will become old and irrelevant with time. Hence, the awareness of web 2.0 tools is speedily emerging technologies in the human race (Robello, 2010). Anunobi & Ogbonna (2012) found that low awareness and use of web 2.0 by librarians in Anambra state. However, academic librarians were more aware of Web 2.0 than librarians working in the public, school and special libraries. There is also little or no awareness by librarians working in the school and special Libraries.

Atilomau & Onuoha (2011) found that librarians are more aware of web 2.0 tool; facebook than the LinkedIn, microblogging tools, and twitter and librarians in Nigerian university libraries are more familiar with social networking sites, instant messaging, and media sharing sites, blogs and wikis; while there is little awareness about RSS feeds, social bookmarking, and podcasts and more popularity of social networking sites like Facebook and Twitter made these frequently-used tools by Nigerian librarians. Baro et, al.(2013) found that librarians were more familiar with SNSs, IMs, and media sharing sites, blogs and wikis. While, Web 2.0 tools such as Flickr, RSS feeds, podcast and social bookmarking were among the least used.

Sandars & Schroter (n.d) found that medical librarians are aware of Web 2.0 technology. Medical school librarians are currently using Web 2.0 though, still at the experimental levels but it is mostly used for information dissemination rather than as a two way communication platform of sharing information.

Utilization of Web 2.0 For Library Services

Utilization of web 2.0 tools is the extent librarians utilized web 2.0 tools to provide effective library services (Agbontan, 2018). Awareness however, does not suggest use; hence, it must be noted that Usage of Web 2.0 technologies varies from one place to another for example Web 2.0 tools especially the social networking sites and tools have been used by academic librarians in developed countries to accomplish various library functions, such as, teaching and promoting information literacy programmes, handling reference services as well as posting resources, news and information on library social web page but Olasina (2011) discovered that Web 2.0 use by Nigerian library professionals was not very popular, Studies reveal that low utilization of web 2.0 tools may be attributed to lack of awareness (Ram et al. 2011**).** Anunobi & Ogbonna (2012) found that academic librarians used Web 2.0 mainly to communicate with friends and professional colleagues as well as to publicize their profiles. Emmanuel et al (2013) also found that the popularity of web 2.0 is overwhelming on news media and internet as it has drawn attention from large audience; it has changed the ways libraries, museums, archives and other cultural heritage organizations render services. Baro et al (2013) found that librarians were more familiar with social networking sites, instant messaging, and media sharing sites, blogs and wikis.. Web 2.0 tools such as Flickr, RSS feeds, podcasts, social bookmarking was among the least used. While, Web 2.0 tools mostly used for reference services were online library news/events, training resources, and image and video sharing.

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

Bradley (2007) opined that libraries should explore new ways of communicating and attracting users through the use of Web 2.0 tools. Miller (2005) also advocated the use of Web 2.0 by libraries in order to serve the users better, attract and retain potential users. He further cautioned that if (Burkhardt, 2010). Xu, Ouyang and Chu (2009) conducted a survey of 81 academic library websites to investigate the application of Web 2.0 tools in university libraries, and how these tools could be used as enhancements to library services. They found that Web 2.0 use in the library consists of five essentials: open, interactive, convergent, collaborative, and participatory.

- **Open**: Allow and enable users to further develop libraries‟ operations and services.
- **Interactive**: Enable users to contribute and react in a library based on the Web 2.0 applications.
- **Convergent**: Various Web 2.0 tools can be utilised to accomplish libraries‘ missions.
- **Collaborative**: Librarians and users should be collaborators rather than disseminators and receivers.
- **Participatory**: Participation is the centre of Library 2.0; the creation and development of library services result from various stakeholders.

Chua & Goh (2010) classified Web 2.0 tools used by libraries into four categories. These included information acquisition tools that are used to gather information from sources outside libraries (for example, blogs and wikis), information dissemination tools that are used to distribute content and information to patrons (such as RSS feeds), information organization tools that facilitate storage and subsequent retrieval of information (social bookmarking and tagging), and information sharing tools that facilitate the bilateral flow of information between libraries and patrons (social networking and media sharing sites. Navik and Amin (2011) observed that the use of Web 2.0 in marketing of library services enables the library to keep in constant touch with the users. It also enables librarians to identify the needs of users and enhance the development of products and services to satisfy users' needs. Mahmood & Richardson (2011) affirmed that the applications of Web 2.0 have opened new avenues for libraries as they have enabled them to involve users in their activities and solicit their feedback for improvement in service delivery. The trend in their study shows that all libraries will adopt Web 2.0 tools for enhancing the quality of effective services.

Anunobi & Ogbonna (2012) found that academic librarians used Web 2.0 mainly to communicate with friends and professional colleagues as well as to publicize profiles and there is low use of the Web 2.0 tools except for Facebook. Atilomau & Onuoha (2011) found that facebook, twitter and LinkedIn, were mostly used; while, twitter is the least used. Zadeh et al (2013) posited that the utilization of these Web 2.0 technologies and it applications will constitute substantive and significant changes in the library as there exist great synchronicity between Web 2.0 and librarianship. Therefore, Nigerian academic libraries and librarians need to embrace Web 2.0 applications and services to enhance libraries and information services in order to offer a wide range of quality services, to reach users anywhere, anytime, anyhow, wherever, as well as justify their existence. Baro et al (2013) found that librarians in Nigerian university libraries use Web 2.0 tools mostly for reference services online.

Harinarayana & Raju (2010) found that Facebook was the most popular in three libraries to accomplish various library functions, such as, teaching and promoting information literacy programmes, handling reference services as well as posting resources, news and information on library social web pages. Arif & Mahmood (2010) found that the maximum usage of Web 2.0 technologies was instant messaging followed by social networking. While, some university libraries use Facebook in the library websites

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

for searching the catalogue by linking their online catalogue while some others for managing their fans 'information which can be completed automatically when new information is added (Li, 2013). Yi's (2014) confirmed that some librarians marketed services and resources using a variety of effective Web 2.0 tools such as blogs and email newsletter, while others used Twitter, wikis, and YouTube to market services and resources. Gerolimos & Konsta (2011) found that Facebook and Twitter were the most used tools amongst the European academic librarians while Asian librarians had largely implemented Tags. Several studies including Rogers (2009), Virkus & Bamigbola (2011), Khan & Bhatti (2012) Techataweewan (2012) revealed that libraries in United States, Europe and Asia are using Web 2.0 tools to enhance services to patrons. Wyatt and Hahn (2011) found that librarians in university libraries in Nigeria use Web 2.0 tools mostly for online reference services, library news/events, training resources, image and video sharing, and social tagging and bookmarking. These findings reinforce earlier findings that libraries utilize Real Simple Syndication (RSS) feeds, blogs, and Twitter to keep patrons abreast of library events, collections, new books, and other new resources that may be of interest to patrons.

Benefit of Web 2.0 for Library Services

Scholars such as Buigues-García and Giménez-Chornet, 2012; Chua and Goh, 2010 outlined the benefits of adopting and integrating Web 2.0 technologies with library services. Muneja & Abungu (2012) enumerated the benefits of Web 2.0 tools to include: reaching vast audience in virtual sphere than would be possible at a physical location. Secondly, raising awareness and promotion, Web 2.0 tools can be updated quickly and published instantly. For instance, by using blogs or micro-blogs, librarians can provide users with news and update information relating to new services, materials or services development. Fourthly, for professional development; librarians use the Internet to communicate, share ideas and offer support for a long time through use of Web 2.0 tools which present opportunity for large-scale professional collaboration and cooperation. Thus, Web 2.0 is an engine of change for academic libraries that assist library professionals to organize resources and enhance user services.

Besides, Web 2.0 tools have brought a significant change to bridge, expand, and promote information services to the patrons in university libraries. Through access to Internet through computers, cellular, and handheld devices; Web 2.0 tools enable users to develop a collaborative virtual society to share information interactively (Hossain & Aydin, 2011). The popularity of social networking applications, blogs and sharing of media has also changed the way and behavior of users of libraries all over the world. Pan, Bradbeer & Jurries (2011) identify the advantages of Web 2.0 to include: convenience, low cost (in terms of developing the applications and marketing purposes), ability to capture best practices, collaboration and communication features. Similarly, Mahmood and Richardson (2011) stated that Web 2.0 tools are low-cost and can be easy to set up and use without specialized programming help, Web 2.0 tools do not require much bandwidth; thus, it is very easy to update and affordable. Web 2.0 tools offer more credible and cost-effective connectivity with prospective students and it all relevance, speed, cost and personalization. Buigues-Garcia & Gimenez-Chornet (2012) claimed that one of the most interesting advantages of the implementation of Web 2.0 is the interaction between the libraries and the users. Users can be continuously informed about the activities taking place in the library, the events that are occurring, what collections are available and receive selected information about the things they are interested. Another benefit of web 2.0 is its ability to take the library services to users in their preferred spaces, the opportunity to build a sense of community between the library and its users, to support co-

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

development of collections and help keep librarians updated on industry news and initiatives, (Taylor and Francis Group 2014). Other benefits of Web 2.0 include:

1. Collaborative, interactive, more user-friendly and multi-rich services to users by encouraging information generation, packaging and dissemination on the web in new and interesting ways.
2. Information sharing/feedback: Web 2.0 has brought about easy information sharing through the creation and use of applications that enable users to create new content by designing uncomplicated software that could be developed together with feedback from users. Information can thus be easily shared rather than being controlled which encourages cooperation and enhances knowledge or Information sharing.
3. Provides libraries the opportunity and access to software and applications that can be subscribed to or downloaded as against the case with Web 1.0 where you have to acquire before installation.
4. Enhances libraries the opportunity to create dynamic online presence and increased awareness.
5. Create universal platform for working groups to share and exchange information and knowledge using online discussion forums and other Web 2.0 tools.
6. Web 2.0 tools have helped university libraries to provide, expand, promote, support and post information services to the patrons.

SKILLS REQUIRED OF LIBRARIANS IN UNIVERSITY LIBRARIES

The introduction of various information technology (ICT) trends has led to reorganization, change in work patterns, and demand for new skills, job retraining and reclassification of positions. Technological advancement in University libraries, such as the electronic database, online services, CD-ROMs and introduction of internet has radically transformed access to information and change in the levels of required skills.

Susan, Baby and Sreerekha (2011) emphasized that the developments in information communication technologies (ICT) have revolutionized the information handling capabilities of academic libraries and information centres all over the world. Library personnel, especially academic librarians have been facing challenges in the profession due to the rapid technological changes with the development of information technologies, particularly the Internet. Currently, librarians play a role as mediators between the vast network of resources and its users. In order to meet the ever changing demands of the users, librarians are required to continuously update ICT knowledge and skills for effective performance. Capacity building in ICT for library personnel is aimed at raising the level of ICT knowledge/skills to enhance their proficiency in provision of modern electronic information services to patrons. Similarly, Krubu and Osawaru (2011) opined that in Nigeria, over the past twenty seven years, (now thirty years) academic libraries have been affected by changes in information and communication technology. Similarly, Satpathy (2011) noted that librarians need to acquire continuous knowledge and skills on the fast changing information communication technology to provide better library services to users. Therefore, for librarians to perform their roles effectively and efficiently in the present electronic library environment they have to possess the necessary level of ICT knowledge and skills, only then can they impart ICT skills to their users.

Shivaputrappa and Ramesh (2013) evaluated the competences in librarianship and information Communication and Technology (ICT) skills between different designations of library professionals working in

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

the engineering college libraries affiliated with Visvesvaraya Technological University (VTU), Belgaum (www.vtu.ac.in) in Karnataka state, India. The significant difference was observed between different designations towards competence on operation of computers, creation of files and folders, radio frequency identification, library automation software modules, various operating systems, internet-related skills, web design/web editors, search engines and digitization of IR. Compared to all designations, librarians have more skills on web designs. This present study did not compare the skills between professionals and paraprofessionals. Similarly, a study carried out by Mathews and Pardue (2009) to investigate the level of ICT knowledge among librarians working in different fields of human endeavours, as well as the knowledge and skills employers deemed essential for librarians to have, concluded that librarians have knowledge of DOS and windows, possess skills in at least eight software packages and programming languages, have fair knowledge of automation software, CD-ROM search, e-mail, internet surfing and search engines. Employers on the other hand, require librarians with knowledge in programming language, networking, web development, project management, system development and system applications. This study investigates the level of ICT skills acquired by library staff in the University libraries of the North-Central, Nigeria. Similarly Ajidahu (2007), and Kao (1998) noted the areas in which library staff could be trained, these include management leadership and communication, computer skills and e-mail management; CDROM use and information technology skills, management of IT skills in library, electronic publishing, personnel management skills and programmes that will lead to fulfilling the role of librarians in the education process.

In the same vein, Ugwuanyi and Ejikeme (2011) noted that librarians need some skills, knowledge and attitudes to survive and flourish in the new era of librarianship. The information landscape is changing and is requiring some skills different from the traditional skills of librarianship for acquisition, organization, dissemination and preservation of library materials. Because of the lot of opportunities available to new era librarians in the ICT world, Kumah (2010) opined that in this digital library environment, librarians needed more than ever before to acquire knowledge and skills in providing services that are expected of them by the clientele of the new environment. To successfully exploit ICT for full benefits, Ugboma (2006), citing Marmwin (1998) noted that information professionals must develop knowledge or expertise in an established programme of knowledge, cultivate the technical capability and subject knowledge.

Similarly, Hoskins (2005) investigated the ICT knowledge and skills of subject librarians at the university libraries of KwaZulu-Natal. A study population of 43 subject librarians, in the university libraries of the Universities of Durban-Westville, Natal (Durban and Pietermaritzburg), and Zululand were surveyed by means of a mailed questionnaire to establish in what ways subject librarians were using ICTs, what the level of ICT knowledge and skill was amongst the subject librarians, what problems the subject librarians faced in the use of ICTs and what their ICT training needs were. Interpretation of the results revealed a low level of ICT knowledge and skill amongst subject librarians and a general lack of formal training for ICTs amongst the subject librarians. However, Oakes, Ferris, Martocchio, Buckley, and Broach (2001) in their study of Cognitive ability and Personality Predictors of training program Skill acquisition and Job performance investigated the relative impact of cognitive ability and personality traits on the ability to acquire skills, and whether training skill acquisition predicts subsequent job performance. The researchers used a sample of 9,793 trainees to address these questions and were able to compare those who succeeded on the job with those who did not succeed on the job. It was revealed that some personality factors positively correlate with skill acquisition and that skill acquisition can predict the level of subsequent job performance.

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

Similarly, Patel, Verma and Lodhi (2011) indicated that libraries have undergone considerable change in the past decade. With increasing use of technology to organize and disseminate information, the ICT has become an important tool for accessing information. Libraries not only have to provide the technology necessary for patrons to use their OPACs, but also must supply a means for access to scholarly digital resources and a growing number of electronic databases. He further observed that, increased patrons' number have spread existing staff more thinly; widening modes of access have brought in more part time patrons; more patron centered learning demands a greater variety of teaching skills; and the explosion of electronic information (from CD-ROM to the Internet) requires continuous updating of knowledge and skills.

Makori, Odini and Ojiambo (2013) investigated the use of information and communications technologies (ICTs) in education and training of undergraduate library and information science (LIS) students in two selected Kenyan Universities and suggest recommendations to improve ICT education and training in the country. A survey research design was used to collect data from various categories of respondents in LIS including lecturers, undergraduate students, information professionals and employers. Interviews and document analysis were also used to collect data from the respondents' education and training that address the needs and demands of the current job market and performance requirements.

The implementation of ICT in libraries has demanded new forms of knowledge and skills among librarians in order to meet the expectations of the present era. Because of the lack of ICT knowledge among professional librarians as reveled by the study of Adeyoyin (2005) many scholars had advocated for a serious re-examination and possible overhauling of Library School Curriculum to include ICT study. Similarly, Muhammad (2004) lamented that, "the fundamental challenge before the Nigerian library and information centers, library and information science schools, and of course information professionals in the electronic age is principally centered around their capacity to educate, train and produce qualified information professionals capable of utilizing ICT infrastructures to maintain a competitive edge in all spheres of human endeavours. For the students to remain relevant in the ICT driven world the library schools must be in the forefront in these monumental changes by re-shaping their curricula to meet the expectations of the 21st century.

Similarly, Hashim and Mukhtar (2005) found justification for this position in a statement that, the library school does not have much choice but to take account of the changes and development while developing the program of studies and the curriculum. Furthermore, Gullati (2006) pointed out that, "library and information science courses must focus on training on IT applications in libraries". Similarly, Muhammad (2010) indicated that in Nigeria, library schools, having realized the challenges posed for future librarians for organizational success, personal performance and career building are now reviewing their curricular to provide students with all the necessary knowledge and skills on ICT.

Estabrook (2005) noted that librarianship without a strong linkage to technology (and its capacity to extend work) will become a mastodon. Technology without reference to the core library principles of information organization and access is deracinated. The role librarian plays in the current academic environment and information age is very diverse as she/he displays skills and knowledge in providing library programs, services and materials that enable her/him to meet the changing information needs of students, as well as supporting academic staff who are engaged in lecture-room instructions, research and knowledge creation. Just as Riley-Huff and Rholes (2011) rightly observed, libraries are increasingly searching for and employing librarians with significant technology skill sets. This has been the trend in recent times in libraries in Nigeria. Librarians working in academic environment therefore, need both the

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

intellectual ability and skills to enable them to accomplish key objectives that are aimed at contributing to the University's mission and vision.

Musoke (2008) in her study of "Strategies for addressing the University library users' changing needs and practices in Sub-Saharan Africa" observed the skills and attributes needed by librarians to include:

1. Communication skills, both written and verbal (plus negotiation or bargaining skills) to support library to library user relations and training.
2. Training skills are closely related to communication skills. A librarian needs training skills to be able to train users in various ways e.g. information literacy/bibliographic instruction/user education and use of new technologies.
3. Technology skills to contribute to the effective execution of library work in the ICT age.
4. Planning and organizing skills which contribute to the library long-term and short-term strategic planning; and the ability to plan one's work and to prioritize as there are so many demands.
5. Initiative and enterprise skills that contribute to innovative outcomes and outputs as well as project management skills. Most libraries have to initiate and implement projects with time lines which have to be strictly adhered to.
6. Team work/interpersonal skills that contribute to productive working relationships and outcomes.
7. Learning and self management skills including the desire for the librarians' professional/career improvement. These skills contribute to the ongoing improvement and expansion in the librarian's knowledge and skills, which enhance the University library's operations, outputs and outcomes.

Similarly, Biddiscombe (2001) observed that in recent years, work for the librarians has become characterized by fast-paced change and new skills requirements. This transformation is as a result of constant emergence of relevant new technologies in libraries. Librarians are increasingly required to adapt their skills and practice in order to gain an awareness of technological advances. He further noted that, there is a need for change in the level of skills to augment the traditional skills with a competency in ICT use. Hence, librarians must be flexible, and adapt traditional skills to incorporate the requirements of technological advances. As Gilman (2005) opined 'the notion that we need professional librarians to run a modern University library is even more valid today than it was in Melville Dewey's age'. As already indicated, the historical role of librarians is changing as librarians are now proactive, multi-tasked and multi-skilled to be able to deliver high quality information services to meet the needs of users.

However, Gbaje and Ukachi (2011) asserted that, information technology has fundamentally affected the operations of library and information services and this has also had great impact on the level of skills and training requirements for library personnel. In the same vein, Krissof and Konrad (1998) argued that for users to consider librarians truly information literate in this age, it is essential that they develop both traditional literacy skills and fundamental computer literacy skills. Furthermore, Latham (2000) argued that every librarian should be familiar with all components of an office suite: word processing, spreadsheets, databases, and scheduling programmes. He further observed that librarians should be able to make use of the extended capabilities of an application: to create charts, import graphics, and attach files, and so forth. They should know what is attached to their CPU, and how it is attached, and they should be able to perform basic troubleshooting functions: power source, monitor adjustments, reboots, printer response, and how to write down error messages.

Similarly, Ward (1999) observed some of the required skills and competencies required by academic librarians as:

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

- **Institutional Knowledge**: The librarians are expected to have a clear understanding of the goals, objectives and mission of the institution or organization. Specialist Subject Knowledge: Librarians should have a thorough knowledge of the subjects and interdisciplinary research in those areas and be concerned with analyzing the contents and evaluating their relevance.
- **Communication Skills:** These are skills and values that professionals should acquire to enable them work and contribute effectively to the organization or institution, client and profession. These range from having good communication skills to bringing the services positively to the notice of those entitled to use them.
- **Professional Competencies**: Librarians should have professional knowledge of information resources, access, technology, management and the ability to use this knowledge as a basis for providing the highest quality information services.

Similarly, Cheng (2001) identified the following core skills needed by the future librarians:

- Good communication skills.
- Should be more than just computer literate and should have a good understanding of ICT and its relation to information resources.
- Should have an in-depth understanding of organizational and user needs that is research based and should organize library resources to satisfy those needs.
- Competent in Web publishing techniques.
- Skilled in manipulating metadata to organize digital information.
- Skilled in training users in the use of e-resources.
- Skilled in filtering, evaluating and appraising Internet information.

In the same vein, Morgan (1996) observed that librarian of this decade has to possess a portfolio of technology related skills in order to complement and support the navigational skills. Such skills help library staff to manage the information more widely and, in turn, transfer these skills to the users as appropriate. These skills include: word processing, desktop publishing, use of bibliographic software packages, spreadsheets, graphics, packages, bulletin-board, familiarity with data and file manipulation, maintaining WWW files, familiarity with local automated systems, IT troubleshooting, and familiarity with different operating systems. Similarly, Idowu (2011) in a paper titled, "Effective Library Service in the College," called on all librarians to update their knowledge by embracing Information Communication Technology skill to remain relevant in Library Services. The paper emphasized the need for all workers in the library especially, librarians to update their computer skill in Microsoft Word, PowerPoint presentation, Excel Worksheet, Internet browsing and some basic information on major e-learning machine – computer.

In the same vein, Cheng (2001) identified the following core competencies needed by librarians:

- Good communication skills.
- Should be more than just computer literate and should have a good understanding of ICT and its relation to information resources.
- Should have an in-depth understanding of organizational and user needs that is research based and should organize library resources to satisfy those needs.
- Competent in Web publishing techniques.

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

- Skilled in manipulating metadata to organize digital information.
- Skilled in training users in the use of e-resources.
- Skilled in filtering, evaluating and appraising Internet information.

Etim (2010) noted that the major trends that must emerge in the curricula of Nigerian library schools are: addressing broad information environments and problems, increasing the infusion of ICT, structuring specialization in major LIS areas and targeting specific user population. The need for students of library and information science to acquire the requisite knowledge as well as develop the needed skills on ICT cannot be overemphasized. Hence, this forms the focus of this study. A self-evaluation survey instrument was designed to ascertain the extent of ICT skills acquired by librarians and library officers in the University libraries in North-Central zone, Nigeria .This study examine the levels of these skills acquired by librarians and library officers in University libraries in North-Central Zone of Nigeria.

CHALLENGES OF WEB 2.0 FOR LIBRARY SERVICES

The utilization of Web 2.0 tools for library services especially in the developing countries has not been without problems. Scholars such as Aduko and Dadzie (2013), Ezeani(2011); Muneja and Abungu (2012) identified the followings as problems affecting the use of web2.0: inadequate number of computers, unstable Internet connectivity, and insufficient electricity; inadequate awareness and Internet skills; inadequate financial resources; and a shortage of trained ICT and library staff. Others are lack of supportive policy or guidelines, lack of security and lack of ownership of intellectual property of Web 2.0 services. According to Baro, the challenges facing the use of web 2.0 include lack of facilities such as computers with internet access, lack of skills and lack of time by librarians in university libraries in Nigeria.

Taylor and Francis (2014) found that time/resource, judging an appropriate tone for communications (formal v. informal; making people aware of the library‘s social media activities were the challenges that affect the use of Web 2.0 tools in libraries. Arif & Mahmood (2012) noted that three factors including lack of computer literacy, lack of training programs and low availability of computers and Internet facilities affect the adoption of Web 2.0 technologies by librarians.

Thanuskodi (2012) identifies inadequate training opportunities, lack of knowledge, privacy and identity theft, slow speed of Internet and electricity failure as some of the problems that hinder the adoption and application of social media tools in academic libraries. Makori, (2012) states that the barriers hindering the use of Web 2.0 includes: lack of funding for training and resources, limited infrastructure, lack of library-centered social media policies, inadequate knowledge and skills among information professionals, inadequate support from the management lack of time by librarians to use social media and lack of interest among librarians. Banda (2011) observe that moral and ethical issues in Web 2.0 environments which are related to privacy, confidentiality, safety, harassment, pornography, fraud, and security are the challenges faced in use of web 2.0. Aduko and Dadzie (2013) found that inadequate awareness and Internet skills; inadequate financial resources; and a shortage of trained ICT and library staff, lack of supportive policy or guidelines, lack of security and lack of ownership of intellectual property of Web 2.0 services affect the use of web 2.0. Mahmood & Richardson (2011) observed that doubts regarding the longevity of tools, lack of staff time for maintenance, lack of standardization and institutional barriers in implementation, lack of staff training, and information overload are the challenges faced in use of web 2.0.

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

Several scholars conducted studies on the level of awareness and utilization of web 2.0 by academic librarians for effective service delivery both within and outside Nigeria. Most of these studies concentrated on the types, purpose; utilization and effect of social networking sites on academic achievements of students. Youssef and Alobaidy (2016) studied the impact of social networking sites on student academic performance: The Case of University of Bahrain. Survey research method was adopted and a structured questionnaire was used to collect data. A total of six hundred twenty eight (628) students were sampled. Data was analyzed using Statistical Package for Social Sciences (SPSS). The result revealed that SNS have positive and negative impacts on student academic performance. At the end, the authors came up with fruitful recommendations on how to get benefit from the SNS to improve the learning process.

In a similar study, Irshad (2012) evaluated the Social Media trends among University Students in Islamia University of Bahawalpur, Pakistan. Survey research method was adopted and a structured questionnaire was used to collect data. A total of six hundred (600) students were sampled using convenient sampling technique. Data was analyzed using MS-Excel Programme. The result revealed that students used face-book for exchanging academic activities and developing social networks throughout the world. Social media was also used for sharing learning experiences with colleagues and international community. Social media was used to promote collaboration and linkage in developing Virtual Community across the world. The problems of social media included bandwidth of internet and electricity break down/ load shedding.

Furthermore, Sur Chandra Singha and Mukut Sarmah carried out a comparative study on the Web 2.0 Tools in Enhancing the Best Practices of User Services in Academic Libraries. The study conducted in the central universities in Assam State on Web 2.0 applications among LIS professionals. During the survey, structured questionnaires were distributed randomly among LIS professionals and the responses were received with a rate of eighty eight percent .The comparative study revealed the respondents' awareness and rate of knowledge about the Web 2.0 tools in the central university libraries.

Similarly Sujata Santosh (2017) studied the awareness, use, and attitude of library professionals towards web 2.0 application: case study of central university libraries in India. The study was aimed at exploring the use of web 2.0 tools and technologies among the library professionals in academic library in India, data was collected through structured questionnaire was mailed to respondents from 46 central universities in India. The Findings suggested fair awareness and familiarity with the web 2.0 tools and technologies among professional librarians, the study provides useful insight to promote the use of web 2.0 among professional librarians in India.

Furthermore, Amjid Khan et al (n.d) carried out a study which investigated the application of Web 2.0 in enhancing the teaching and learning of technology education courses in tertiary institutions in Rivers State. A sample of 360 respondents (students, 300; lecturers, 60) was used for the study. The study adopted a descriptive survey design. Simple random sampling technique was used to compose the sample. Four research questions were answered while one hypothesis was tested in the study at 0.05 level of significance. The primary data were gathered with a structured questionnaire design after Likert-5-point rating scale. The instrument used for data collection was "Questionnaires for Lecturers/ Student's Perception on Usability Level of Web 2.0 Technologies (QL/SPULWT)". The QL/SPULWT was objectively used to elicit both lecturers and students' responses on the following: the usability level of application in the classroom, the conditions necessary for its application, its benefits and the barriers associated with the application of these tools. A reliability coefficient of 0.75 was established through Cronbach Alpha. Mean with Standard Deviation was used to answer the research questions while z-test was used to test the hypothesis. It was found that the major problems of Web 2.0 applications in teaching

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

and learning are inadequate training facilities, low bandwidth and time constraint. It was recommended among others that there should be in-service workshop training on Web 2.0 tools; schools should provide a fast speedy internet facility with high bandwidth and also to provide constant power supply sources.

Finally, Okite-Amughoro and Faith Ashinedu (2017) carried a study which the purpose was to explore the effectiveness of using Web 2.0 to market academic libraries services in three purposively selected universities in South-South Nigeria. The post-positivism paradigm was used to underpin the study with an exploratory survey research design. The population of the study consisted of librarians and students in the institutions surveyed. Purposive random sampling was used to select the respondents. The validity and reliability of the data collection instruments were achieved through the piloting and triangulation. Survey questionnaires and semi-structured face-to-face interviews were used to collect data. Statistical Package for Social Sciences (SPSS) was used to sort, code and analyze quantitative data, while thematic content analysis was used to analyses qualitative data. The results revealed that librarians and students in the selected universities in South-South Nigeria were active users of Web 2.0 tools. The results further revealed that the most used Web 2.0 tools were Facebook, Twitter, Instant Message, and Internet Forum. Moreover, it was found that Web 2.0 tools were being used to promote library services, reach a new audience of potential users, push library news and press releases to users and provide quick updates about the services to users as well as provide reference services online. The results showed that librarians and students in the institutions surveyed have positive attitude and perception towards the use of Web 2.0 tools, and librarians desire to use Web 2.0 tools. Students were interested in using Web 2.0, as librarians were anxious to learn modern ways of marketing library services. The results revealed a lack of policies to guide the implementation of Web 2.0 tools for the marketing of library services in the institutions surveyed. The results found the need to optimize the use of Web 2.0 tools to market library.

CONCLUSION

Web 2.0 tools play crucial role in effective service delivery of librarians in university libraries. This paper examined the concept of digital library. It highlighted the major features of digital library and how it can be used in dynamic ways to create access. The potentials of digital library are very crucial as means of access to knowledge and information that will facilitate development. It will bring about access to remote/distant resources; full text search and retrieval access to resources. Therefore, librarians should be proactive in the adoption and use of upgrade of web 4.0 which is more current than web 2.0 to become relevant in the digital era.

RECOMMENDATIONS

The following recommendations are made as follows:

1. Awareness of web 2.0 tools should be provided by the library management
2. improve and maximize the optimum usage of web 2.0 tools by librarians
3. workshops/training, flyers and brochures should be widely distributed in the academic staff's offices and also be publicized during exhibitions,

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

4. Connectivity to network sites and internet should be improved to facilitate instant information search by students.
5. Libraries' web pages should provide an online guide and various search-options to web 2.0 tools.
6. libraries should subscribe to current relevant upgrade of web 4.0 tools
7. Training on information search skills should be given to librarians to ensure proper utilization upgrade of web 4.0 tools.
8. Libraries should look into the possibility of integrating web 2.0 tools into its Website particularly in its OPAC. This would allow greater visibility of library services thus making it possible for user to access library services.
9. libraries may provide selective dissemination of information to faculty members regarding appropriate use of upgrade of web 4.0 tools
10. Adequate funding should be provided by parent institutions to promote procurement and utilization upgrade of web 4.0 tools for library services.

REFERENCES

Abram, S. (2005). *Web 2.0, Library 2.0 and Librarian 2.0. Preparing for the 2.0. World*. SirsiDynix OneSource, 2.1. Available at http: www.imakenews.com/sirsi/e_article000505688.cfm

Adekunmisi, N. S. R., & Odunewu, A. O. (2016). Web 2.0 and Nigerian Academic Librarian. *Journal of Education and Practice*, *7*(35).

Aduko, A. A., & Dadzie, P. (2013). Social media challenges in marketing of library and Information services at the Balme Library, University of Ghana. Innovation. *Journal of Appropriate Librarianship and Information Work in Southern Africa: Ethical Dimension of Social Media in the Information Society*, *47*, 213–230.

Alonge, A. J. (2012). Social Media in Library and Centers. In A. Tella & A. O. Issa (Eds.), *Library and Information Science in Developing Countries: Contemporary Issues*. Philadelphia: IGI Global Publication. doi:10.4018/978-1-61350-335-5.ch021

Anttiroiko, A., & Savolainen, R. (2011). Towards Library 2.0: The adoption of Web 2.0 Technologies in public libraries. Libri. *International Journal of Libraries & Information Services*, *61*(2), 87–99.

Anunobi, C. V., & Ogbonna, A. U. (2012). Web 2.0 use by librarians in a state in Nigeria. *Developing Country Studies*, *2*(5), 57–66.

Arif, A. and Mahmood, K. (2010). Allama Iqbal Open University library services to teachers: A survey. *Pakistan Library & Information Science Journal, 41*(4).

Atulomah, B. C., & Onuoha, U. D. (2011). Harnessing collective intelligence through online social networks: A study of librarians in private Universities in Ogun state, Nigeria. *Ozean Journal of Social Sciences*, *4*(2), 71–83.

Baro, E. E., Idiodi, E.O., & Godfrey, V.Z. (n.d.). *Awareness and use of web 2.0 tools by librarians in University libraries in Nigeria.* Available at http://www.emeraldinsight.com/doi/abs/10.1108/OCLC-12-2012-0042

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

Boateng, F., & Quan Liu, Y. (2014). Web 2.0 applications 'usage and trends in top US Academic libraries. *Library Hi Tech*, *32*(1), 120–138. doi:10.1108/LHT-07-2013-0093

Bradley, P. (2007). *How to use web 2.0 in your library*. London: Facet Publishing.

Buckley, B. (2008). Sue Tube: Web 2.0 and copyright infringement. *The Columbia Journal of Law and the Arts*, *31*(2), 235–263.

Collins, G., & Quan-Haase, A. (2012). Social Media and academic libraries: Current trends and Future challenges. *The American Society for Information Science and Technology*, *49*(1), 1–4. doi:10.1002/meet.14504901272

Dankowski, T. (2013). How libraries are using social media: Expanding online toolkits to Promote advocacy. *American Libraries*, *44*(5), 38–41.

Dhar, V., & Sundararajan, A. (2007). Information technologies in business: A blueprint for education and research. *Information Systems Research*, *18*(2), 125–141. doi:10.1287/isre.1070.0126

Dickson, A. and Holley, R. P. (2010). Social networking in academic libraries, the possibilities And the concerns. *School of Library and Information Science Faculty Research Publications,* Paper 33.

Kelly, B. (2008). *Library 2.0: Opportunities and Challenges*. Paper presented at the NDAP International Conference, Taipei, Taiwan. Retrieved July 12, 2018 from http://www.ukoln.ac.uk/web-focus/events/conferences/ndap-2008/

Khan, S. A., & Bhatti, R. (2012). Application of social media in marketing of library and Information services: A case study from Pakistan. *Webology*, *9*(1), Article 93. Retrieved from http://www.webology.org/2012/v9n1/a93.html

Kim, Y., & Abbas, J. (2010). Adoption of Library 2.0 functionalities by academic libraries and Users. a knowledge management perspective. *Journal of Academic Librarianship*, *36*(3), 211–218. doi:10.1016/j.acalib.2010.03.003

Makinde, O. T., Aba, J. I., & Ugah, A. D. (2017) Accessibility and Utilization of Reference Resources by Fisheries Undergraduate Students in Universities in North- Central, Nigeria. *Journal of Applied Information Science and Technology, 10*(3), 61-71. Retrieved from https://www.jaistonline.org/

Sachin, K. V. (2014). Impact of use of social networking sites on libraries. *Knowledge Librarian*, (1), 116-124.

Shivalingaiah, D., & Naik, U. (2011). Social networking tools: social bookmarking and social tagging. In *Proceedings of the 8th International CALIBER-2011, Goa University, Goa*. Ahmedabad: INFLIBNET Centre; Retrieved from http://ir.inflibnet.ac.in/bitstream/1944/1600/1/7.pdf

Si, L., Shi, R., & Chen, B. (2011). An investigation and analysis of the application of Web 2.0 in Chinese university libraries. *The Electronic Library*, *29*(5), 651–668. doi:10.1108/02640471111177080

Taylor and Francis Group. (2014). *Use of Social Media by the library current practices and Future opportunities*. Retrieved from www.tandf.co.uk/journals/access/white-paper-social-media.pdf

Techataweewan, W. (2012). Perceptions and use of Web 2.0 of Thai academic librarians. Academic Press.

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

Thanuskodi, S. (2012). Awareness of library 2.0 applications among library and information 234 Science professionals at Annamalai University, India. *International Journal of Library Science*, *1*(5), 75–83. doi:10.5923/j.library.20120105.02

Thompson, J. (2007). Is education 1.0 ready for web 2.0 students? *Innovate (North Miami Beach, Fla.)*, *3*(4).

Virkus, S., & Bamigbola, A. A. (2011). Students' conceptions and experiences of Web 2.0 tools. *New Library World*, *112*(11/12), 479–489. doi:10.1108/03074801111190473

Voigt, C. (2008). *Educational design and media choice for collaborative, electronic case-based learning* (PhD thesis). University of Technology Ilmenau. Retrieved July 9 2018 from citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.154.6198

Vucovich, L. A., Gordon, V. S., Mitchell, N., & Ennis, L. A. (2013). Is the time and effort worth It? One library's evaluation of using social networking tools for outreach. *Medical Reference Services Quarterly*, *32*(1), 12–25. doi:10.1080/02763869.2013.749107 PMID:23394417

Vygotsky, L. (1978). *Mind in society*. Cambridge, MA: Harvard University Press.

Walia, P., & Gupta, M. (2012). Application of Web 2.0 tools by national libraries. *Webology, 9*(2), 13-13. Available at http://www.webology.org/2012/v9n2/a99.html

Wyatt, A. M., & Hahn, S. E. (2011). Copyright concerns triggered by Web 2.0. *RSR. Reference Services Review*, *39*(2), 303–317. doi:10.1108/00907321111135501

Yi, Z. (2014). Australian Academic Librarians 'Perceptions of Effective Web 2.0 Tools Used to Market Services and Resources. *Journal of Academic Librarianship*, *40*(3), 220–227. doi:10.1016/j.acalib.2014.02.009

Zadeh, S. K., Veisi, A. G., & Zadeh, E. K. (2013). Web 2.0 and Libraries. *Advanced Research.* Available at http://www.journalijar.com

KEY TERMS AND DEFINITIONS

Awareness: Referred to in this study as the extent to which library users are sensitized about the functions, values and varieties of Web 2.0 services and resources in the library.

Library: Referred to in this study as an institution where information resources in different are selected, acquired, organized, utilized, and disseminated to satisfy users' needs.

Library Services: Referred to in this study as information services, and activities or functions provided in the library.

Utilization: Referred to in this study as the practical application and use of Web 2.0 to render library services to users.

Web 2.0: Referred to in this study as a collective set of Internet-based tools which includes wikis, blogs, web-based applications, social networking sites.

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

Chapter 21

Impact of Social Media Usage on Information Retrieval Among Undergraduate Students in Faculty of Management Sciences, University of Ilorin

Evelyn Olakitan Akinboro
University of Ilorin, Nigeria

Taylor Morenikeji Olayinka
University of Ilorin, Nigeria

ABSTRACT

The chapter examined the impact of social media on information retrieval among undergraduate students in Faculty of Management Science, University of Ilorin. It determined the social media network that undergraduate students are more exposed to for retrieving information, identifying the differences in undergraduate students' usage of social media network for information retrieval based on gender and age brackets, exploring preference for social media compared to other sources of information retrieval system available for students, exploring the types of information retrieved from social media network, and identifying the challenges faced by undergraduates in the use of social media networks. The population of the study was comprised of 3,634 students out of which a sample of 360 was chosen through stratified random technique. A self-designed questionnaire was used to collect data. Five research questions were developed and answered by the study. The findings revealed that undergraduate students' exposure to social media is very high.

DOI: 10.4018/978-1-5225-9034-7.ch021

Copyright © 2020, IGI Global. Copying or distributing in print or electronic forms without written permission of IGI Global is prohibited.

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

BACKGROUND

The social media tools where students exposure is high is WhatsApp application compared to any other social media platform. Students prefer using social media platforms to retrieve information than using conventional resources like textbooks, journals, etc. There is a negligible difference between social media exposure level of Male gender and Female gender. Furthermore, the study revealed that undergraduates' level of exposure varies by age brackets while those within age bracket 21-25years have the highest level of exposure. The study also demonstrated that a higher percentage of students like using social media platforms to retrieve Information on the latest update of school activities and to gratify their need in entertainment. The major challenge faced by students is the high cost of access to social media platforms (subscription).

INTRODUCTION

Social media provides an easy way to receive feedback and communicate with peers, young adults attitudes of themselves can be affected by using social media networks (Pempek, Yermolayeva & Calvert 2009). Social media sites empower users to take an active role in their own socialization process and in constructing their own self-identity (Urista,2009). A personal profile is the way users present themselves; they can include as much information as desired about themselves, including posting pictures. Due to digital technology, users can show considerable information about themselves and their friends. This self-disclosure is a way to open up their own identities of how they want others to perceive them (Pempek et al., 2009). Intimate self-disclosures help produce greater intimacy in computer-mediated communication than in face-to-face contacts (Jiang, Bazarova, & Hancock, 2011). Producing an attractive personal profile for others to admire is a way to improve self-concept. It has been suggested that individuals partake in selective self-presentation on social media sites so they may appear to want to impress others (Jiang et al., 2011). This is especially true for college students as they self-disclose frequently during this exploratory period. In accordance with Arnett's theory, emerging adulthood (18-25 years old) is a time when there is a period of freedom and independence in a young person's life (Arnett, 2000). Self-disclosure is an identity challenge in emerging adulthood (Pempek et al., 2009). Self-disclosure helps by getting feedback from peers that helps develop a sense of self and strengthens existing relationships as well (Pempek et al., 2009). Many individuals use social network sites to feel popular, trying to add as many "friends" as possible so they appear to be more admired. Young adults reported an average of 358 Facebook friends (Pempek et al., 2009). Another study reported a mean of 200 Facebook friends, almost all of which they had met in person prior to the internet connection (West, Lewis, & Currie, 2009). According to Peter (2015), a direct relationship exists between Social media usage and the academic performance of students in universities. However the darker side within technological evolution has resulted in dilemmas such as the setback of real values of life especially among students who form the majority of users interacting through the use of social networking sites. Online social networking sites focus on building and reflecting social associations among people who share interests and or activities. With so many social networking sites displayed on the internet, students are tempted to abandon their homework and reading times in preference for chatting online with friends. Many students are now addicted to the online rave of the moment, with Facebook, Twitter etc. Today most youths and students possess Facebook accounts. The reason most of them perform badly in school

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

might not be far- fetched. While many minds might be quick to blame the poor quality of teachers, they might have to think even harder, if they have not heard of the Facebook frenzy (Oche & Aminu 2010). Olubiyi (2012) noted that these days' students are so engrossed in the social media that they are almost 24 hours online. Even in classrooms and lecture theatres, it has been observed that some students are always busy pinging, going or Facebooking, while lectures are on. Times that ought to be channeled towards learning, academic research and innovating have been crushed by the passion for meeting new friends online, and most times busy discussing trivial issues.

Apart from the negative way of using social media by youths especially students in tertiary institutions, the platform can be used for information retrieval. Information has become the most significant source of our day-to-day life. Information available on internet may create some confusion among its users because of its diversity. Information leads to confirmation but when information is processed and internalized it becomes knowledge. Today, lots of information is available in print and non-print format thereby leading to information overload. Internet is one of the vital sources of information. Sometimes it becomes impossible for the users to understand the available information or they do not understand where to find it or they are unable to access the right information. These factors lead to their stress, delay in decision making, waste of time etc. Social networks are very popular these days, and it facilitates search and retrieval of information through internet. One of the best examples of information retrieval system (IRS) is library system where information is stored, processed, organized and retrieved on demand of its users. However, social media is now serving as an avenue for retrieving information. Availability of information is not synonymous to usage. Information can be available but not being accessed by users especially undergraduate students. There is a need to know whether students are accessing information on social media and how the available information has been impacting these students. Hence, the study will be undertaken on impact of Social media usage on information retrieval among undergraduate students in the University of Ilorin, Kwara State.

Everybody needs information, however the kind of information needed may differ. Advancement in technology has really advanced information retrieval. Information users now access information through various means. Information now resides everywhere including the 'cloud'. Most of the available sources of information on the web have social links on their sites as an alternative way of access to information. One would not question the incorporation of social links in most of these information providers because social media has turn to a "household concept". Everybody wants to be online! Many people, especially students in tertiary institutions make use of at least one social media platform. The benefit of the existing social media sites cannot be overestimated. Information materials for academic can be found in many, if not all, of these social media sites. Since most of the students in tertiary institutions are using social media, it is expected that the platform will go a long way in helping them to seek their information needs easily and as at when due. In University of Ilorin, it was observed closely that almost all students in use social media sites for different activities like for academic purpose, entertainment purpose, religious purpose, e.t.c.

However, the researchers have observed that despite the benefits of social media identified in the literature such as providing opportunities to connect with friends and loved ones, sharing academic information, collaboration with academic colleagues etc,; research that focus on the impact of social media on undergraduate students information retrieval seems to have been ignored. Not this alone research that examine use of social media and its impact on access to and retrieval of information particularly among the undergraduate students of the University of Ilorin, Nigeria is currently lacking. Most researchers have reviewed the various uses of social media networking site but majority of the researchers focused

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

only on the usage and purpose of social media sites. These are gaps in knowledge that need to be filled. Hence, the study examined the impact of social media usage on information retrieval among undergraduate students in Faculty of Management science, University of Ilorin.

Objectives of the Study

The broad objective of this study is to examine the impact of social media usage on information retrieval among undergraduate students in Faculty of Management Science, University of Ilorin. The specific objectives are to:

1. determine the social media network that undergraduate students' in Faculty of Management science, University of Ilorin are more exposed to for retrieving information;
2. identify the differences in undergraduate students' usage of social media network for information retrieval based on gender and age brackets;
3. determine the students preference for social media compare to other sources of information retrieval system available to students in Faculty of Management Science, University of Ilorin;
4. Identify the types of information retrieved from social media network by undergraduates in Faculty of Management Science, University of Ilorin; and
5. identify the challenges faced by undergraduates in Faculty of Management science, University of Ilorin in the use of Social Media Networks to retrieve information.

Research Questions

In order to achieve the objectives of this study, the following research questions are formulated accordingly:

1. What social media are used to retrieve information by the undergraduate students in Faculty of Management science, University of Ilorin?
2. What differences exist in the Faculty of Management science, University of Ilorin undergraduate students' usage of social media network for information retrieval in terms of gender and age brackets?
3. What is the undergraduate students' in Faculty of Management science, University of Ilorin preference for social media platform to retrieve information compared to other sources of information retrieval system available?
4. What are the types of information retrieved by undergraduates in Faculty of Management science, University of Ilorin with the aid of social media networks?
5. What are the problems encountered by undergraduates in Faculty of Management science, University of Ilorin in the use of Social Media Networks to retrieve information for their respective information needs?

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

LITERATURE REVIEW

Concept of Social Media

Social media is a phenomenon that has been developing in a rapid pace. Different scholars have described in different ways, to Jacka & Scott (2011) there is no single recognized definition of social media. However, Drury (2008) defines social media as "online resources that people use to share content: video, photos, images, text, ideas, insight, humor, opinion, gossip, news". Safko & Brake (2008) further defined social media as "activities, practices, and behaviors among communities of people who gather online to share information, knowledge, and opinions using conversational media. Conventional media are Web-based applications that make possible for one to create and easily transmit content in the form of words, pictures, videos, and audios (Safko & Brake, 2008).

Lewis (2009) defines social media as the platforms that link people together in order to provide a means which will allow them to create and share content with others. According to Choi & Kang (2014), social media can be categorized into two: those (Facebook, Twitter, Pinterest, YouTube, Flikr) for social networking and those (Wikis, Blogs, Discussion Boards, Online Forums) for learning activities.Social media is that means that employs mobile and web based technology to create highly interactive platforms via which individuals and community share, co-create, discuss and modifies user generated content (Kietzmannn, 2012).Social networks are online services, platforms or sites that focus building and reflecting social relations among people, who, for example, share interests and activities. Social networking sites are websites that allow those who have account with them to communicate with a selected group of friends (Awake, 2011). According to Eke (2014), most of the social networks are web-based and provide means for their users to interact via the Internet, such as e-mail and instant messaging; social networks allow activities, events and interact within their individual networks. Social media, as defined by Bryer & Zavatarro (2011) are technologies that facilitate social interaction, make possible collaboration, and enable deliberation across stakeholders. These technologies now include blogs, wikis, media (audio, photo, video, text) sharing tools, networking platforms, and virtual worlds.

Alican & Saban (2013) defined the Social Networks as the web sites that provides people with an environment for creating profile with personal information, developing new friendships from all over the World, maintaining existing friendships in an online environments, sharing and commenting on something and organizing events.Parr (2010) defines social media as the use of electronic and Internet tools for the purpose of sharing and discussing information and experiences with other human beings in more efficient ways.Social Media Online (2011) defined social media as primarily internet-and mobile-based tools for sharing and discussing information by users. The term, according to Andreas and Michael (2010) refers to a group of Internet-based applications that build on the ideological and technological foundations of Web 2.0 and that allow the creation and exchange of user-generated content. Web 2.0 was coined by Darcy DiNucci in 1999 to describe interactive social websites which allow users to interact and collaborate with each other in a social media dialogue.Kietzmannn, Silverstre, McCarthy and Leylan (2012) describe social media as the platform that employs mobile and web based technology to create highly interactive platforms via which individuals and community share, co-create, discuss and modifies user generated content. Social media is a platform that facilitates information sharing and participation from users of the media in order to create and/or distribute the content (Steenkamp & Hyde-Clarke, 2014). These platforms have shifted the emphasis of Internet services from being consumption-based

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

towards becoming more interactive and collaborative, thereby creating new opportunities for interaction between organizations and the public (Henderson & Bowley, 2010).

By contrast, the foundation of social media is based on user generated content (UGC), that is, various forms of media content created by internet users and available on the web based on Web 2.0 technology (Kaplan & Haenlein, 2010). Social media applications include blogs and micro blogs (logger & twitter), wikis (Wikipedia), social networking (e.g. Facebook, LinkedIn), multimedia sharing services (YouTube), content syndication (e.g. RSS feeds), podcasting and content tagging services (Hansen, Shneiderman, & Smith, 2010).

Categories of Social Media

Social media are classified based on the nature of their communities; which include social news, social measuring, micro blogging, video, sharing, photo sharing, professional networks, niche communities, social E-mail, comment communities, broadcasting communities, blog networks, product-based, networks, presentation sharing and review and recommendation sites (Jason, 2010).

According to Mayfield (2008), there are basically seven kinds of social media, including social networks, blogs, wikis, podcasts, forums, content communities and microblogging. In the same vein, Kaplan & Haenlein (2010) classified social media into six different classes as follows; collaborative project (Wikipedia); blogs and micro blogs (Twitter); content communities(Youtube); social networking site (Facebook. 2go, BB chat); virtual game world (world of war craft); and virtual second world (second life).

Types of Social Media Students Are Exposed to for Information Retrieval

Facebook

Facebook is the most popular social networking sites (Rainie, Smith, & Duggan, 2013), followed by Twitter (Brenner & Smith, 2013) and LinkedIn (Duggan & Brenner, 2012). Facebook allows users to set up a profile and post updates, links, photos, conversations, and the like. Christopher (2010) opined that some social networking websites such as Facebook, fall in the "general, category, they accommodate folks of all interest and backgrounds on this type of social networking websites. Members can after include their interest and then locate members with similar interests by searching for key words and key phrases. The main purpose of general social networking websites is to serve as a special platform where people can reunite with old friends; stay connected with current ones, and even make new acquaintances. Morseo, Sponcil & Gitimu (2007) reported that 88.5% recognized Facebook as their preferred social media site. Wang, Chen, & Liang (2011) reported that students spend roughly 100 minutes per day on Facebook. In 2007, 92% of college students reported that they had a Facebook account. By 2008, 99% of students had an account on Facebook (Wang, Chen, &Liang, 2011). Also, Williams & Merten (2008) found that university students are often obsessed with their Facebook and Twitter profile. A study by Pempek, Yermolayeva, &Calvert (2009) showed that students spend an average of 28 minutes a day on Facebook (p. 231). Student researchers from the Whitmore School of Economics and Business found that younger students tend to use Facebook more frequently than older students to keep in touch with friends from high school or from their home town (Pempek, Yermolayeva, & Calvert, 2009). Many individuals use social network sites to feel popular, trying to add as many "friends" as possible so they appear to be more admired. Young adults reported an average of 358 Facebook friends (Pempek, Yermolayeva, &

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

Calvert, 2009, p. 236). Quan-Haase & Young (2010) found that 82% of college students reported logging into Facebook several times a day.

Twitter

Twitter allows users to send out short messages or "tweets" about what they are doing or links to resources of interest. People can choose to "follow" selected users' tweets and they can retweet or repost someone's tweet for others to see. It is an online version of text-messaging with the capability of sending the same message to several thousand people all at once (Ezumah, 2013). As a social network, Twitter revolves around the principle of followers. When you choose to follow another Twitter user, his/her tweets appear in reverse chronological order on your main Twitter page (Olaniran, 2014).

Linkedin

Linkedin is targeted at professionals interested in professional networking. Each user sets up a profile similar to a resume and then can link to other people that they know. Having been created in 2003, LinkedIn is one of the oldest social networks. However, this particular site is relatively new to younger generations. Facebook, Twitter and Linkedin are being joined by a complete new line of competitors in the social media business. LinkedIn is a strictly professional site that focuses on business and professional relationships. Its mission statement attests to a commitment to "connect the world's professionals to make them more productive and successful" (LinkedIn, 2012). The social network platforms Snapchat, Instagram, Pinterest, and YouTube have become the new gateway for the expression for today's college generation.

MySpace

MySpace's founder, Tom Anderson, capitalized on a rumor that Friendster networks (social networking sites that helped people maintain their offline relationship online and provided a dating forum as well) might be asking for a fee. Andersen lured Friendster users to this new site with an offer for free membership. At the same time, the Indie-rock band from Los Angeles was expelled from Friendster for violation of some regulation and MySpace extended a welcoming hand to them as well. They found their new home on MySpace site (Boyd & Ellison, 2008; Newman, 2008). Certain features such as the ability to build one's front page and profile, advertising, a forum for interaction between bands and their fans, and complying with user-demands especially requests for personalizing pages including background designs, and uploading information links—were great advantages of and for MySpace (Boyd & Ellison, 2008). MySpace reached its peak in popularity when it attracted News Corp. to pay $580 million in 2005 for its acquisition (BusinessWeek, 2005). Ironically, as soon as News Corp. acquired MySpace (which was considered the summit of its existence), the site met a downward spiral in terms of popularity, revenue, and membership due to incidences of sexual predators and abusers. This was a serious issue that compelled Connecticut Attorney General, Richard Blumenthal to call for more stringent control and regulations on MySpace (Oser, 2006).

Snapchat

Snapchat is an application for iPhones, iPads and Android devices. It allows subscribers to send to other subscriber's photos that expire in one to ten seconds. There are an estimated 100 million daily active users

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

of Snapchat, about 70% of whom are women (Smith, 2015). Wagner (2014) found that more than 77% of college students use Snapchat at least once per day. The most popular Snapchat use was for creativity (73%) followed by keeping in touch (27%). About one-fourth of the college student respondents (23%) reported that Snapchat is easier to use than texting (n.p.). Instagram. Instagram is an application that allows users to take pictures and videos and share them on a variety of social networking platforms. It is owned by Facebook.

Pinterest

Pinterest is a personalized media platform which allows registered users to "pin" and organize media content into collections called pin-boards. Users can also browse the content of others in their feed.

YouTube

Youtube is a video sharing website. It is owned by Google. Unregistered users can watch videos and registered users can upload videos.

Uses of Social Media by Undergraduate Students

Social networking sites have become excellent tools for education and can be used socially and collaboratively between learners and teachers as well as amongst students. Asabere (2012) notes that "current ICT trends are providing accessibility to online services such as social networks and this enable collaboration amongst students and contribute a lot to social learning activities. Students of tertiary institutions in Nigeria are keying into the limitless opportunities". Social media technologies provide to their user's adequate freedom of what they do with them (Wilson, 2012).

As social media platforms are many, so also their functions and uses are. Osatuyi (2013) elaborated social networks are classified based on how people use them. For instance, Social Networking Sites such as MySpace, Facebook are used to share and update message, Microblogs such as Twitter is used for short messages, Wikis are mainly used for educational and informational purposes, Blogs are usually personal or collaborative online publishing diary, while Online Forums are interactive space where participants discuss issues which are posted on a discussion board.As a communication platform, many undergraduate students use the Internet with its various applications such as social media like Facebook, Twitter, YouTube, etc. for different purposes. According to Adelabu (2011), social media is on daily basis creating new culture which is geared towards sharing information and being surprised by the experiences, knowledge, and voices of others. For undergraduate students, there are various reasons for the usage of social media, Gross (2004) noted that 'students use social networking sites not only for leisure and personal socialization but also as a platform for more meaningful and serious deliberations, and students are using social networking for making friends, sharing links, online learning, finding jobs to accomplish their economic, educational, political and social being. Bilandzic, Patriarche &Traudt (2012) introduced three main "Social Use of Media" as: interactivity, recognition, and participation. People use social media for either hard or soft issues or both. For instance, some people use social media to play online games, while others use it to negotiate, establish, maintain, and participate in a political and cultural issue. Therefore, the popularity, availability, and accessibility of social media technologies make their usage in almost every aspect of life. Osatuyi (2013) listed that, people use social networks to organize campaigns (political or non-political), create awareness, social interaction, sharing of in-

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

formation, marketing, healthcare activities. But the list of its usage goes beyond that. In institutions of learning, social media are used as tools for instructions, students' engagement, and peer review (Choi & Kang, 2014). In higher institutions in Nigeria, Asemah & Edegoh (2013) asserted that, many students are assumed to be using social networks.Tınmaz (2013) explained that todays' youth utilize social networks with very different purposes, such as establishing new friendships, keeping in touch with existing friends and being accessible all the time. According to Richter and Koch (2008), social networking sites provide users with the opportunities for identity management and for keeping in touch with other users.

Specifically, Minocha (2009) opines that social networking enhances a student's sense of community, sharing and collaboration brings an additional responsibility and workload, which some students find inflexible and rather "forced". For instance, Konetes and McKeague (2011) reported that students are using Facebook and other channels to develop their identities, beliefs and stances on various issues such as politics, religion, economy and works, as well as to pioneer and develop intimate relationships. Also, Gross (2004) noted that students use social networking sites not only for leisure and personal socialisation but also as a platform for more meaningful and serious deliberations, and students are using social networking for making friends, sharing links, online learning, finding jobs to accomplish their economic, educational, political and social being.According to Nicole (2007), students and teenagers have especially recognized these social media platforms to be able to contact their peers, share information, reinvent their personas and showcase their social live.

Social media according to Onuoha, Unegbu and Lasisi (2012) creates an avenue for undergraduates to network with one another irrespective of time or space. The introduction of Facebook, twitter and other digital media, according to Levine (2012), has opened up a whole new world of social interaction, and potential distraction in the office environment. Kim, Yoo-Lee and Sin (2011) in their study pointed out that as social media are gaining popularity, and some of them seem to be playing an important role as an information sources, it is crucial to understand what kinds of social media are used as information sources.

Tukru et al. (2013) reported that university students in Turkey use Facebook more for communicating with friends, getting information about people and events, entertainment and relaxing as well as messaging. Oluwatoyin (2011) stated that users of SNSs spend an average of two to six hours studying while non-users spent between eight and seventeen hours studying per week. Schulten (2000) opines that Student spend an average of 40 to 50 minutes a day surfing on Facebook. Many students find that they actually spend 3 to 4 minutes during each visit to check updates, making several visits a day and others spend 8 hours a day on the website (Rouis, Limayen & Sangari, 2011).

Preferred Social Media by Undergraduate Students

In the view of Ahsan & Chand (2012) the most favorite social networking sites are Facebook, Twitter, LinkedIn, WhatsApp among the lot. According to the study, about 87.5% of students of both genders have Facebook accounts and consume equal time on the internet. The study observed further that male students have a lot of Facebook companions but female students consume much of their time on Facebook. Kanagarathiam (2014) undertook a study on the impact of social networking sites on the academic performance of adolescents in Coimbatore City India, and disclosed that students used Facebook, Skype, WhatsApp and YouTube than any other sites. In the study, Google+ and LinkedIn were reported as the least used sites among the participants. Mazman & Usluel (2010), indicated that Facebook is the popular social-networking site due to its educational usefulness, information sharing, its structure and multiple uses. In the view of Lenhart,A., Purcell, K.,Smith, A., & Zickuhr, K. (2010) females are more likely than

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

males to have a personal profiles on Facebook, but males are more likely than females to sustain a profile on LinkedIn. According to Moran, Seaman, & Tinti-Kane (2012), YouTube is the most frequently used social media tool in the classroom. Students can watch videos, answer questions and discuss content and additionally, create videos to share with others.

Another survey found that the users of Facebook were unlikely to look for information through their network on Facebook. However, they still thought that useful information was given to them by that site (Lampe, et al., 2012). It showed that more information was encountered than sought (Lampe, et al., 2012). Another study showed that social networking was about interaction with friends and not news (Wilson, T., 2012). Sharing of news was found to be more on Twitter. The motivations for the sharing three kinds of information on Twitter were investigated. These were posts from friends, breaking news and information related to the intrinsic use of the user. Breaking news was found to be the most popular information shared (Xu, et al., 2012). Twitter was also found to be a significant source of news at the times of political or natural disasters well as crisis (Mansour, 2012). It was also revealed that Twitter had a powerful ability to collect information from the scenes of disaster and visualizing it for decision making on relief work. Disaster relief information could also be broadcast using Twitter (Gao, 2012).

Concept of Information Retrieval

Information resources as a variable play a role in the way libraries are utilized. Information resources are not only acquired but organized in such a way they can be easily accessed and retrieved by users. Information retrieval is concerned with the exploitation and extraction of information and other contents of documents from different information sources (Akanwa & Udo-Anyanwu, 2017). Retrieval tools are crucial for retrieving information for educational outcomes. Information retrieval tools according to Edom (2012) are the simple mechanisms or apparatuses that aid the library user to locate, retrieve and use the needed documents from the library or information from a book or document. He further outlined the tools to include; bibliographies, indexes and abstracts, catalogues, computer filing or websites, subject index, title index, directories, OPAC, CD-ROMS, online databases, internet search engines, etc. Presently, there are various tools at students' disposal to aid them in access the information they need. In addition, Nnadozie (2007) listed the library information retrieval tools to include: reading list, index, abstract, library catalogue, search engine, OPAC, bibliography, shelf guides, web-based information retrieval systems which are presently, at students' disposal to aid them in accessing information.

Influence of Gender in the Use of Social Media

A study on the gender of users of social networking sites appears to have some impact on the online information behaviour. Globally, male students tend to use internet sources more frequently than females (Li & Kirkup, 2007). In a similar study by Nadkarni &Hofmann, (2012) concerning media use, social networking sites emerge to be used by female rather than male students.

A study carried out by Raacke & Bonds-Raacke (2008) indicated that although females and males are both likely to have SNS accounts, the purposes for creating the accounts may vary based on gender. For females, social networking sites are primarily to reinforce pre-existing friendships; for males, the networks also offer a way for sexual activities and making new friends (Raacke & Bonds-Raacke, 2008).

Giles & Price (2008) revealed that females use social media for chatting and downloading music. Rafferty (2009) opined that the primary purposes female use social networks platform are to post pictures

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

of themselves and also to discuss sex issues on these public fora. Merten & Williams (2009) reported that females are more likely to share their personal information on SNSs which is a public platform than their male counterparts. Merten & Williams (2009) emphasized that about 55% of females shared their private issues such as depression, anxiety, and relationship problems on SNSs, while 15% of males shared any personal information besides their hobbies, interests, and friendships. According to Boneva et al., (2001) sending and receiving emails with friends and family was one of the dominant online activities for females, while males tended to spend more time on reading online news, engaging in task-oriented work, or visiting websites of governmental departments (Na, 2002).

Challenges in the Use of Social Media for Information Retrieval

Farkus, et al (2012) opined that some of the challenges associated with use of social media stem from the risks inherent in student internet usage. They went on to argue that internet exposes students to inappropriate material, unwanted adult interactions, and bullying from peers. Similar remarks were made by Romero-Frías & Montaño (2012) that, Web 2.0 is also a source of concern regarding issues such as, privacy, authorship and ownership rights, digital divide in the classroom or time management issues. Additionally, Benito-Ruiz (2009) cited information overload as another challenge whereas, Keen (2007), lamented quality of content as a major concern. Since social networking sites are part of Web 2 technologies the challenges raised here are also true of social networking sites.

Generally, Oluwalanu et al (2014) identified the following as some of the challenges in the use of social media in Nigeria.

- **Lack of Basic Amenities:** Nigeria, like many Third World countries constantly battle outage of power across the country so much that even when the learner has the means to access information through these social sites, the unavailability of power supply has always had a debilitating effect on the desire to source for information on the internet.
- **Lack of Conducive Environment**: Again, because there are no constant power supply, learners may not have access to the site as and at when due; and when they do they may be doing so at internet cafe which may not be conducive for learning purpose. Access to computers: despite the prevalence of computers in the Nigerian market, not many Nigerians have access to computers, and when they do it is but for a few working hours except for few who have laptops and modems at home.

RELATED STUDIES

Baym, Zhang, & Lin (2004) studied social interactions of college students across all media. Their results indicated that 64% still prefer face-to-face interaction, 18.4% prefer the telephone, and only 16.1% prefer the internet for making social contacts. The internet interactions reported showed that e-mail was by far the most dominant form of contact, followed by chat and instant-messaging (Baym et al., 2004). Of the 51 participants in the study, 49 reported conducting their social life contacts through at least two, and often three, methods on any given day (Baym et al., 2004). Similarly, one study reported that over 27% of young adults used a social networking site every day in 2009 (Lenhart, Purcell, Smith, & Zickuhr, 2010).

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

Idubor (2015) investigated social media usage and addiction levels among undergraduates in University of Ibadan, Nigeria. The study revealed that majority of the respondents attested to making friends 651 (78.2%), getting news 566 (67.9%), communication 554 (66.5%) and online learning 450 (54.0%) as the major purposes for which they make use of social media networks. This implies that undergraduate students in University of Ibadan make use of social media network mainly for the purposes of making friends, getting news, communication and online learning.

Asemah & Edegoh (2013) examined the influence of social media on the academic performance of the undergraduate students of Kogi State University. The rationale behind the study is to find out whether the exposure of the students to social media has effect on their academic performance. The survey research method was adopted, employing the questionnaire as an instrument of data collection. The findings show that undergraduate students of Kogi State University, Anyigba, Nigeria, have access to social media and that their exposure to social media is to a very great extent. Findings also showed that exposure to social media has effect on the students and that the effect is negative. Findings also showed that Facebook is the most used social media by undergraduate students of Kogi State University. Based on the findings, the paper concludes that exposure to social media by the undergraduate students of Kogi State University has negative effect on their academic performance. Eke, Omekwu and Odoh (2014) in their study on the use of social networking sites among the undergraduate students of University of Nigeria, Nsukka. They found out that those students use social media for communicating with friends, online learning, finding friends online, academic purpose etc. Khan (2010) carried out a study on the impact of social networking websites on students. The study sampled 168 participants and out of this number, 101 were males, while 67 were females. Findings of the study reported that majority of male students use social networking sites than their female counterpart and their purpose is for searching knowledge.

According to Lenhart et al., (2010), about 57% of social network users are 18-29 years old and have personal profiles on multiple social media websites. In a study by Pempek, Yermolayeva, & Calvert (2009), the amount of time spent daily on social network sites varied greatly. However, an analysis of the data indicated most participants spent approximately thirty minutes a day socializing, mostly during the evening hours between 9p.m to 12a.m students spent an average of forty seven minutes a day on Facebook. More than 50% of college students go on social networking sites several times a day (Sheldon, 2008).A study undertook by Lin & Subrahmanyam (2007) reported that males have been online more than their female's counterparts in the past decades because of earlier forms of technology such as video or computer games. Thompson & Lougheed (2012), found that more females are "heavy users" of Facebook and that they spend more than 1 hour a day on the site than their male counterparts. According to Lenhart, Purcell, Smith, & Zickuhr (2010), 72% of all college students have a social media profile with 45% of college students using a social media site at least once a day. In the study of Sheldon (2008) about 50% of college students go on a social networking site several times a day.

Shen and Khalifa (2010) carried out a study on gender differences in relation to Facebook among Arabic students. The study found that Arabic females spend fewer hours on Facebook than their male's counterparts as the females consider too much time on Facebook as time wasting. Budden, Anthony, Budden, and Jones (2007), carried out a survey study using 272 undergraduate and graduate students. The research found that females spent more time on social networking sites such as Facebook and MySpace than males, though, these differences were not found to be statistically significant. In a similar study by Foregger (2008) it came out that female freshmen and female juniors spent most of their time on Facebook, while male juniors and male seniors spent lesser amount of time on the site.

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

Ndaku (2013) investigated the impact of social media on students' academic performance. The aim of the study was to analyze the impact of social media on the student's academic performance Respondents were drawn from the University of Abuja, using the simple random sampling technique and purposive sampling. Four research questions guided the study. Research findings showed that a great number of students in University of Abuja, had access to the internet. To this end, the researcher recommended that sites should be created for educational purposes as well. This is to create a balance between social networking and academic activities of students to avoid setbacks in the academic performance of the students.

From the above studies it could be articulated that modern technology in correspondence undoubtedly has transformed the whole world into a "Worldwide Village". Be that as it may, modernization like two sides of a coin, carry with it both the negative and positive sides. This implies that although social media is a very good tool that improve educational upbringing of students if used appropriately, it also has a negative aspect if students over indulge themselves to it. Social networking sites are considered to play an active role in younger generation's daily lives (Lenhart, 2009), as most of the active users are students of tertiary institutions. No wonder, Oblinger & Oblinger (2005) called them 'the most wired and connected generation in human history', 'Digital Natives', and 'the Net Generation'. Against this backdrop, The rapid growth of this technology has improved and enabled collaborative and learning activities especially because of its high level of interactivity, accessibility and affordability. However, exposure and use of these networks tend to have both positive and negative implications on the student. David, Helou and Rahim (2012) buttressed this in their assertion emanating from their findings that "as a result of more time being dedicated to the use of social networking sites for non-academic usage and less time to academic usage by students, it tells considerably on what becomes their academic output". In view of this, the use of social networking sites has raised dust among researchers. Some see it as distraction to learning for the student as it involves multitasking, while others attest to the potentials of Social networking sites for learning. There are also those who argue that young adult learners view and use Social networking sites as platforms for socializing more than learning. Burke (2010) conducted a study on social network activity and social well-being and revealed that females spend more time on social network sites and use them more actively than their male's counterparts. The study of Tufekci (2008) confirmed that majority of the females were four to five times more likely than males to use social networking sites.

The reviewed literature has shown the importance and the collaborative usage of social media among undergraduate students. Specifically, the reviewed studies showed that social media are primarily used by undergraduate for academic related activities. The reviewed literature also showed that there is a great usage of social media among undergraduate students with preference for Facebook coupled with heavy usage among the male students compare to female.

More so, the reviewed literature showed that social media can have both negative and positive effect on the academic performance of undergraduate students; however, undergraduate students are recommended to use the platform for the benefits of their academics. Information overload coupled with information retrieval skill are found to be the major challenges of using social media for information retrieval. To the best of the knowledge of the researchers, there is dearth of literature on the impact of social media on information retrieval among undergraduate students. It is on this note that this study sough to investigate the impact of social media on information retrieval among undergraduate students of the Faculty of Management Sciences, University of Ilorin.

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

METHODOLOGY

Research Design

The research design adopted for this study was survey method. This method was the most appropriate for the study because it involves gathering data on a target population. Ifidon and Ifidon (2007) posited that survey research gathers data from a population in order to determine the status of that population with respect to one or more variables. However, it is characterized by selecting sample from a population and the findings obtained can be used in the generalization of the population. It is believed to be the best research type to get facts about social media usage for information retrieval by undergraduates in University of Ilorin.

Population of the Study

The target population in this research is all the full time undergraduate students in the Faculty of Management Sciences, University of Ilorin in 2017/2018 academic session. Faculty of Management Sciences comprises of six departments, with population indicated in Table 1.

The total population (**3,634**) comprised undergraduate full time students (COMSIT, 2018).

Sampling and Sample Size

The sampling technique adopted in this study is simple random sampling and stratified random sampling. Simple random sampling is considered suitable for this study because it gave respondents equal chance of being part of the study. Sampling and sample size are crucial issues in quantitative research. This is to enable statistically based generalizations from the study results to the entire population.To generalize in this way, it is essential that the sampling method used and the sample size is appropriate, such that the results are representative, and that the statistics can discern associations or differences within the results of a study. Sample represents a smaller group of the elements or members, drawn through some definite procedure from a specified population. In order to determine the required sample for the population, Slovin's formula was used to calculate the sample size for the population (3,634). The sample size for this research is 360 going by:

Table 1. Population of the study

S	Name of Department	Population
1	Accounting	819
2	Finance	847
3	Business Administration	557
4	Marketing	450
5	Industrial relations and Personal management	553
	Public Administration	550
	TOTAL	3,634

Source: Academic planning office unilorin (2018)

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

Slovin's formula, where:

n= Number of sample size
N= Total population size
e= Acceptable error value/tolerance

(Error of tolerance 95%=0.05)

$n=N \div (1+Ne^2)$

$n=3,634 \div (1+3,634\times0.05\times0.05) = 360$. (See table 2)

The total population (3,634) comprised undergraduate full time students (COMSIT, 2018).

Instrument(s) for Data Collection

A structurally designed questionnaire was used for the collection of data in this study. The instrument was designed to reflect the purpose of the study. The choice of questionnaire for the collection of data in this study was based on the fact that most related studies reviewed in chapter two adopted the use of questionnaire for the collection of data. The instrument comprised of sections A and B. Section A required the respondents‟ bio-data information including name, gender, age, and education level. Section B contained the items based on the purpose of the study. A check list response format was used for the items. This consisted of Yes (2) and No (1) response format.

Procedure for Data Collection

The questionnaire was administered to the undergraduate students in Faculty of Management Sciences, University of Ilorin. The administration of questionnaire to respondents was done within a period of five days (9th of July 2018 to 13th of July 2018).

Table 2. Population and sample size selection

S/N	Name of Department	Population	Sample
1	Accounting	819	60
2	Finance	847	60
3	Business Administration	557	60
4	Marketing	450	60
5	Industrial relations and Personal management	553	60
6	Public Administration	550	60
	Total	**3,634**	**360**

A total of 360 questionnaires were administered to the six department in faculty of management science (60 questionnaire per department).

Source: Academic planning office unilorin (2018)

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

Validity and Reliability of the Instrument(s)

To ensure the validity of the questionnaire used in this study, lecturers from the department of Library and Information Science, University of Ilorin, reviewed the questionnaire. The advice and suggestions given by these lecturers led to the modification of the items in the questionnaire. All the items in the instrument were judged to be relevant to what is being measured thereby ensuring both the content and face validity of the instrument. The questionnaire was subjected to pilot test. Split half method of reliability was used in order to establish that the data is consistent, stable and reliable. Reliability of the instrument was determined by calculating the Cronbach's alpha coefficient. According to Ary et al. (2006), an instrument must have a Cronbach's Alpha Value of 0.7 or above to be considered to have adequate internal consistency and reliable for use with a given population. The items on the questionnaire structured for this study had an average Cronbach's value of 0.766 for the all the items on the questionnaire (excluding demographics). This means that the research instrument (questionnaire), have relatively good internal consistency. According to Warmbrod (2001), if Cronbach's Alpha is greater than 0.7, the instrument is good and it is reliable. Based on B the alpha coefficient value of this instrument is 0.746 (Cronbach's Alpha), the instrument can be adopted repeatedly.

Data Analysis Technique

Descriptive statistics is the major method adopted in the course of analyzing the data gathered through the administration of Questionnaire. Data collected were analyzed using frequency counts and percentages for variables such as age and gender, level or year of study and department. Questionnaire was used to gather data from respondent. This Questionnaire was generated from the research questions which include section A and B. Section A requires the respondents' bio-data information including name, gender, age, and education level. Section B contained items based on the purpose of the study. Descriptive and inferential statistics are the major methods adopted in the course of analyzing the data gathered.

Ethical Considerations

In order to get quality research work, some research ethics are considered in the course of study. The researchers give priority to honesty, confidentiality and informed consent. Also, that none of the copyright law is violated. Every work are cited and referenced accordingly. None of the reviewed literature is plagiarized. All works used are acknowledged.

RESULTS AND DISCUSSION

This section presents the analysis of data gathered from the respondents in this study which focused on "Impact of Social Media Usage on information retrieval among Undergraduate Students in University of Ilorin". The data was gathered using a self-administered face-to-face questionnaire to Undergraduate students in Faculty of Management Science, University of Ilorin.

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

Data Analysis

Demographics of Respondents

All the respondents for this study vary by different demographic characteristics. Their varying demographic characteristics were based on department, gender, academic level, and age brackets (See Table 4). In faculty of Management Science where the data was gathered, the departments surveyed were department of Accounting, Business Administration, Finance, Public Administration, Marketing and departments of Industrial Relations and Personnel Management (IRPM). Responses rate from each of this department are shown in Table 3.

Out of 353 respondents, 59 of them each are from the departments of Accounting, Business Administration and Public Admin with each representing 16.71% of the total respondents. Also 60 of the respondents which represents 17.0% of the total respondents are from department of Finance while frequencies of 58 each which 16.43% of the total respondents are from the department of IRPM and Marketing. Apart from departments, the respondents have specific demographics. Table 4 shows the demographics of the respondents in respect to gender, academic level and age bracket. Data gathered in these categories are shown in Table 4.

As shown in Table 4, responses from Male gender have frequency of 170 which represents 48.2% of the total population while responses from Female gender have frequency of 183 representing 51.8% of the total population. In terms of academic level, 66 students representing 18.8% of the respondents are 100Level students while 115 of them representing 32.6% of the total respondents are from 200Level. In the same category, there are 77 respondents from 300Level which represents 21.8% of the total respondents; while those from 400Level have a frequency of 95 representing 26.9% of the total respondents. In the age bracket category, respondents 16-20years of age have a frequency of 126 representing 35.7% of the total sampled while between 21-25years has a frequency of 195 representing 55.2% of total respondents. Also, sampled undergraduates between ages 26-30years are 23 in number which represents 6.5% of the total sampled while only 1 respondents representing 0.3% of the total sampled is between 31-35years and 8 of them above 35years representing 2.3% of the total respondents. These demographics mean that there are more female respondents than the female respondents although with just 3.6% difference. Most of the respondents are from 200Level while majority of the respondents are from ages16-25years.

Table 3. Distribution of respondents by departments

Departments	Frequency	Percent (%)
1. Accounting	59	16.7
2. Business Administration	59	16.7
3. Finance	60	17.0
4. Public Administration	59	16.7
5. Marketing	58	16.4
6. IRPM	58	16.4
TOTAL	353	100.0

Source: Author's survey, 2018

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

Table 4. Demographics of respondents

Demographic Variables		Frequency	Percent (%)
Gender	Male	170	48.2
	Female	183	51.8
	Total	**353**	**100%**
Academic Level	100 Level	66	18.7
	200 Level	115	32.6
	300 Level	77	21.8
	400 Level	95	26.9
	Total	**353**	**100%**
Age Bracket	16-20 years	126	35.7
	21-25 years	195	55.2
	26-30 years	23	6.5
	31-35 years	1	.3
	Above 35 years	8	2.3
	Total	**353**	**100%**

Source: Author's survey, 2018

Exposure of Respondents to Social Media

Table 5 shows various existing social media networks. The exposure of respondents was measured using some specified social media platforms. The social media platform specified was WhatsApp, Facebook, Twitter, YouTube, Instagram, LinkedIn, Skype and Blogs. Respondents' level of exposure was measured using Friedman's Mean Rankings.

The rankings of respondents based on their level of exposure are arranged in shown in Table 5 (arranged in descending order). From the results, WhatsApp has the highest mean rank followed by Facebook (6.59), Instagram (6.52), Twitter (6.36), Blogs (6.25), YouTube (5.96), LinkedIn (4.88), followed by Skype which has the lowest mean ranking of 4.66. This result means that undergraduate are more exposed to WhatsApp than any other social media platform.

Differences in Respondents' Social Media Usage for Information Retrieval Based on Gender

The differences between respondents' exposure to social media based on gender are shown in Table 6 Mean of each gender (Male and Female) are compared with different social media platforms used for information retrieval by undergraduates in the faculty of management science, university of Ilorin.

In Table 6, Male respondents who use WhatsApp have a mean value of 0.98 while Female respondents using WhatsApp have a mean value of 1.00. Male gender using Facebook have mean of 0.84 while female gender have mean of 0.69. There are equal mean values of 0.72 each for those that use Twitter by both genders. YouTube users have 0.59 mean values for male gender and 0.69 for female gender. For Instagram, 0.63 and 0.86 mean values were recorded for Male and Female gender respectively. There

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

Table 5. Distribution of respondents based on exposure to social media

Social Media Platforms	YES		NO		Mean Rank
	Freq.	Perc. (%)	Freq.	Perc. (%)	
1. WhatsApp	349	98.9	4	1.1	**7.84**
2. Facebook	269	76.2	84	23.8	**6.59**
3. Instagram	264	74.8	89	25.2	**6.52**
4. Twitter	254	72.0	99	28.0	**6.36**
5. Blogs	247	70.0	106	30.0	**6.25**
6. YouTube	228	64.6	125	35.4	**5.96**
7. LinkedIn	159	45.0	194	55.0	**4.88**
8. Skype	145	41.1	208	58.9	**4.66**

Note: No other social media platform(s) was indicated apart from the ones specified
Source: Author's survey, 2018

Table 6. Mean differences between social media usage and genders (Male and Female)

Social Media Platforms	Male			Female		
	Mean	N	Std. Dev	Mean	N	Std. Dev
WhatsApp	**.98**	170	.152	**1.00**	183	.000
Facebook	**.84**	170	.367	**.69**	183	.464
Twitter	**.72**	170	.449	**.72**	183	.452
YouTube	**.59**	170	.493	**.69**	183	.462
Instagram	**.63**	170	.484	**.86**	183	.350
LinkedIn	**.56**	170	.497	**.34**	183	.476
Skype	**.44**	170	.498	**.38**	183	.487
Blogs	**.71**	170	.454	**.69**	183	.464

Source: Author's survey, 2018

is 0.56 mean values for LinkedIn users by Male genders while there are 0.34 mean value for female gender users. Subsequently, Skype users have 0.44 and 0.38 mean values for Male and Female genders respectively while Blogs users have 0.71 mean for Male gender and 0.69 mean for female gender. These results imply that there is just a slight difference in social media usage between Male and Female gender in the faculty of management science, university of Ilorin.

Preference for Social Media Compared to Other Information Retrieval System

Social media platforms are greatly used by the respondents as a result of their high exposure to most of the platforms. Since other information retrieval exists apart from social media, respondents preferences for other social media platforms was measured using Friedman's Test as shown in Table 7. The Mean rankings in the test were used to measure the degree of respondents' preference. The Table only shows the frequency of those that "prefer" social media networks than other information retrieval systems out of the 353 respondents.

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

Table 7. Social Media Preference of respondents compared to other information retrieval systems N=353

Social Media Preferred	Frequency	Mean Rank
1. WhatsApp	342	**7.82**
2. Facebook	258	**6.51**
3. Twitter	240	**6.23**
4. YouTube	237	**6.18**
5. Instagram	235	**6.15**
6. Blogs	232	**6.10**
7. LinkedIn	165	**5.06**
8. Skype	127	**4.47**

Note: No other social media platform(s) was preferred apart from the ones specified
Source: Author's survey, 2018

Table 7 shows the descending order of preference of respondents with social media platform than other information retrieval systems. From the results, WhatsApp has the highest mean rank of 7.82 followed by Facebook (6.51), Twitter (6.23), YouTube (6.18), Instagram (6.15), Blogs (6.10), followed by Skype which has the lowest mean ranking of 4.47. This result indicates that undergraduate students surveyed preferred all the specified social media platforms than other retrieval systems except for Skype which has a low Mean Ranking.

Types of Information Retrieved Through Social Media

It has been established that the respondents prefer using social media to retrieve information than other information retrieval systems. The type of information retrieved through social media networks by these respondents are shown in Table 8. Only the frequencies of those that agreed to the statements are shown in Table 8. The mean values of each type of information are also shown in the Table 8 which serves as a determinant for acceptance or rejection of the statements used to measure the type of information they (respondents) preferred

From Table 8, 345 with a mean value of 0.98 retrieved Information about the latest update on school activities; 306 of the total respondents with 0.87 mean value retrieve information on courses undertaken; while 269 of them having 0.67 mean value make use of the social media to broaden their horizon. In the same vein, 248 of them with 0.70 Mean value use it to acquire new skills; 281 with 0.80 mean use it for clarification while 213 of them having 0.60 mean use it to know more about language, ethics and values. Also, 268 of the total respondents with a mean value of 0.76 use it to know the latest trends in the media while 332 of them with 0.94 mean value use it for entertainment and 217 of them with a mean value of 0.61 use it to retrieve information on Relationship and Marriage. Also in Table 8, it was gathered that 207 of the undergraduate student sampled with a mean values of 0.59 search information related to politics on social media while 241 of them with 0.68 Mean value use it for Health; and 253 of them having 0.72 use it for Job purposes. For Agriculture related information, 196 respondents with a mean value of 0.56 indicated that they use it for that purpose while 234 with a mean value of 0.66 use it to retrieve information about latest technology 221 of the total respondents use it for retrieving information relating to Religion with a Mean value of 0.63.

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

Table 8. Distribution of respondents based on Types of Information Retrieved through Social Media

Statements	Freq.	X	Decision
1. Information about the latest update on school activities	345	0.98	Accepted
2. Information related to one of the courses undertaken in the department	306	0.87	Accepted
3. Information to broaden my horizon	269	0.67	Accepted
4. Information on how to acquire new skills	248	0.70	Accepted
5. Information for more clarifications of things taught in class	281	0.80	Accepted
6. Information about language, ethics and values	213	0.60	Accepted
7. Information about latest trends on social media	268	0.76	Accepted
8. Information related to entertainment	332	0.94	Accepted
9. Information on relationship and marriage	217	0.61	Accepted
10. Information about politics	207	0.59	Accepted
11. Information about health	241	0.68	Accepted
12. Information related to job	253	0.72	Accepted
13. Information related to agriculture	196	0.56	Accepted
14. Information about the latest technology	234	0.66	Accepted
15. Information on religion	221	0.63	Accepted

Note: No other types of information was indicated order than the specified ones
Source: Author's survey, 2018

Challenges Faced in the Use of Social Media Networks for Information Retrieval

Respondents' high exposure and preference for social media networks are not without challenges. The challenges faced by the surveyed undergraduate students in the faculty of management science are shown in Table 9.

As shown in Table 9 challenges faced varied and the remarks were given based on the scale of "very high", "High" and "Moderate" in order to have a general overview of the weight of each challenge. It was gathered that 243 representing 68.8% of the respondents indicated that *information overload* is a challenge while 240 of them covering 68.0% total sampled stated that *Distraction* is a challenge and 248 of them representing 70.3% stated that *the existence of information that is not authentic in social media* is also a challenge while 241 of them (68.3%) stated that existence of *plagiarism* in some retrieved information through social media is a challenge. Subsequently, 213 respondents representing 68.3% of the total respondents stated that *source credibility is lacking* in some information materials available on social media while 192 of them (54.4%) believe that digital divide is a challenge. It was also gathered that 222 respondents representing 62.9% of the respondents indicates confidentiality as an issue while 291 of them (82.5%) indicates high cost of access to social media as a challenge. From the results, it can be deduced that the challenges highly faced by the respondents in the use of social media for retrieving information are cost of accessing social media and inauthentic information on the social media.

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

Table 9. Challenges faced in the use of social media networks for information retrieval

Statements	Yes		No		Remark
	Freq.	Perc.(%)	Freq.	Perc.(%)	
1. Information over load (too much of information on social media networks)	243	68.8	110	31.2	High
2. Distraction in the course of retrieving information	240	68.0	113	32.0	High
3. Existence of information that is not authentic	248	70.3	105	29.7	Very High
4. Existence 5. of plagiarism on some of the retrieved information	241	68.3	112	31.7	High
6. Source credibility is lacking in some of the information available on social media networks	213	60.3	140	39.7	High
7. Digital divide i.e. technology has created gap between those that know about technology and those that do not know	192	54.4	161	45.6	Moderate
8. Confidentiality is a big issue	222	62.9	131	37.1	High
9. High cost of access to the social media	291	82.4	62	17.6	Very High

Note: No other types of information was indicated order than the specified ones
Source: Author's survey, 2018

Discussion of Findings

All the departments in the faculty of Management science were almost evenly represented based on the data collected. The findings of the study are dominated by more female gender, and more of them are in 200Level. More of the responses of the analyzed data were from those within the age of 21-25years. It is assumed that any students in this age category is mature enough to give valid answer to the center focus of this research project. It was found that undergraduate students in the faculty of Management Science are well exposed to various social media networks. Perhaps this was as a result of the assertion of Boyd (2007) who stated that Social networking sites provide an outlet for teens to express themselves in their own unique ways. Almost all of them (98.9%) are exposed to WhatsApp (See Table 6). This is not surprising because youths of this present age are very exposed to WhatsApp and WhatsApp is allows for expressiveness which was indicate by Boyd (2007).. Apart from WhatsApp, undergraduate students studied are also very exposed to Facebook, Twitter, YouTube, Instagram and Blogs. Meanwhile, more than half of the respondents are not aware about LinkedIn and Skype. Findings of this study also showed that there is just a slight difference between undergraduates' social media exposure and gender (See Table 5). The difference in the exposure level of Male gender to female gender is negligible. In other words, there is no significant difference between the level of exposure by male gender and level of exposure by female gender. This is similar to the findings of Perin (2015) that women and men use social media at similar rates.

To a very large extent, majority of the respondents prefer to use social media to retrieve needed information than other information retrieval systems. However, their rate of preference (see Table 7) is closely related to their level of exposure to social media (See Table 6). This means that their preference for social media was greatly influenced by their level of exposure and it may also be vice versa. The

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

Undergraduate Students studied make use of social media to retrieve Information about the latest update on school activities; subject undertaken; broadening of horizon; acquiring of new skills; clarification; learning of language, ethics and values; following latest trends in the media; entertainment; information on Relationship and Marriage; Politics; Health; Job Search; Agriculture; Technology; and Religion. In all, the three main types of information mostly retrieved online are information based on the assignment given in class; Entertainment; and subject undertaken in the department respectively.

Despite the exposure, preference and gratification of social media by the undergraduates studied, it was gathered that there are some challenges they faced in the course of retrieving information through social media platforms. Some of the challenges they faced include information overload, distraction, plagiarized materials, source credibility problem, digital divide, confidentiality and high cost of access to social media platforms. From all these challenges, high cost of access to social media platforms is the major challenge indicated by almost all the surveyed undergraduate students.

CONCLUSION

This study provides findings that can inform future researcher, Lecturers, scholars, family care agencies, educational institutions, and social work agencies on the Social Media Usage for the Retrieval of Information among Undergraduate Students in University of Ilorin.

Students in the Faculty of Management Science, University of Ilorin are very exposed to social media. They also prefer social media than the conventional way of getting information. Hence, their preference level is a function of their level of exposure. This make social media network to be greatly used among the undergraduate students for the retrieval of information.

RECOMMENDATIONS

Since there were shortcomings in the areas of study and based on the research focus, there is a need to suggest ways by which the shortcomings can be resolved. Therefore, the following recommendations were proffered based on the findings of this study:

1. Students should not have a bias preference for social media platforms than the conventional sources of information like textbooks and journals because the conventional sources of information had been adjudged to contain more quality information than the ones on the social media platforms.
2. The management of the institution should endeavor to put in place strong Internet connectivity for her students in order to have access to social media since high cost of subscription is a challenge to these students.
3. Students should control their high exposure to social media in order to prevent them from being addicted to social media networks

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

REFERENCES

Adelabu, O. (2011). The role of social media in democratic mobilization in Nigeria. In *Media, terrorism and political communication in a multicultural environment conference proceedings*.

Ahsan, U., & Chand, S. (2012). The pattern of facebook usage and its impact on academic performance of university students: A gender based comparison. *Bulletin of Education and Research*, *34*(2), 19–28.

Alican, C., & Saban, A. (2013). Ortaokul ve lisede öğrencim gören öğrencilerin sosyal medya kullanımına ilişkin tutumları: Ürgüp Örneği. *Sosyal Bilimler Enstitüsü Dergisi*, *35*(2), 1–14.

Arnett, J.J. (2000). Emerging adulthood: A theory of development from the late teens through the twenties. *American Psychologist*, *55*(5), 469-480. doi: 066x.55.5.469 doi:10.1037/0003

Asabere, N. Y. (2012). *A research analysis of online social networking sites (SNSs) and social behaviour at University of Ghana (UG)*. Legon, Accra, Ghana. In International Journal of Science and Technology.

Asemah, E. S., & Edegoh, L. O. N. (2013). Influence of social media on the academic performance of the undergraduate students of Kogi State University, Anyigba, Nigeria. *Journal of Research in Humanities and Social Sciences*, *3*(12), 90–91.

Bachchhav, K. P. (2016). *Information Retrieval: search process, techniques and strategies*. Retrieved on 29th of July from: www.ijnglt.com

Baker, L. R., & Oswald, D. L. (2010). Shyness and online social networking services. *Journal of Social and Personal Relationships*, *27*(7), 873–889. doi:10.1177/0265407510375261

Barker, V. (2009). Older adolescents' motivations for social network site use: The influence of gender, group identity, and collective self-esteem. *Cyberpsychology & Behavior*, *12*(2), 209–213. doi:10.1089/cpb.2008.0228 PMID:19250021

Baym, N. K., Zhang, Y. B., Kunkel, A., Ledbetter, A., & Mei-Chen, L. (2007). Relational quality and media use in interpersonal relationships. *New Media & Society*, *9*(5), 735–752. doi:10.1177/1461444807080339

Baym, N. K., Zhang, Y. B., & Lin, M. (2004). Social interactions across media. *New Media & Society*, *6*(3), 299–318. doi:10.1177/1461444804041438

Bilandzic, H., Patriarche, G., & Traudt, P. J. (Eds.). (2012). *The social use of media: cultural and social scientific perspectives on audience research*. Intellect Books.

Bonds-Raacke, J., & Raacke, J. (2008). MySpace and facebook: Applying the uses and gratifications theory to exploring friend-networking sites. *Cyberpsychology & Behavior*, *11*(2), 169–174. doi:10.1089/cpb.2007.0056 PMID:18422409

Boneva, B., Kraut, R., & Frohlich, D. (2001). Using e-mail for personal relationships: The difference gender makes. *The American Behavioral Scientist*, *45*(3), 530–549. doi:10.1177/00027640121957204

Bowen, G. (2008). Preventing school dropout: The eco-interactional developmental model of school success. *Prevention Researcher*, *16*, 3–8.

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

Boyd, D. M., & Ellison, N. B. (2008). Social network sites: Definition, history, and scholarship. *Journal of Computer-Mediated Communication*, *13*(1), 210–230. doi:10.1111/j.1083-6101.2007.00393.x

Brenner, J., & Smith, A. (2013). *72% of online adults are social networking site users*. Washington, DC: Pew Internet & American Life Project.

Bryant, J. A., Sanders-Jackson, A., & Smallwood, A. (2006). IMing, text messaging, and adolescent social networks. *Journal of Computer-Mediated Communication*, *11*, 10. Retrieved from http://jcmc.indiana.edu/vol11/issue2/Bryant.html

Bryer, T. A., & Zavattaro, S. M. (2011). Social media and public administration: Theoretical dimensions and introduction to the symposium. *Administrative Theory & Praxis*, *33*(3), 325–340. doi:10.2753/ATP1084-1806330301

BusinessWeek. (2005). MySpace: WhoseSpace? *BusinessWeek.*

Cabral. (2011). Is Generation Y Addicted to Social Media? *The Elon Journal of Undergraduate Research in Communications*, *2*(1), 5-14.

Choi, J., & Kang, W. (2014). A dynamic examination motives forusing social media and social media usage among undergraduate students. A latent class analysis. *Procedia: Social and Behavioral Sciences*, *131*, 202–210. doi:10.1016/j.sbspro.2014.04.105

Christopher, S. G. K. (2010). Issues in Information behavior in social media. *Libers.*, *24*(2), 75–96.

Coyle, C., & Vaughn, H. (2008). summer). Social networking: Communication revolution or evolution. *Bell Labs Technical Journal*, *13*(2), 13–17. doi:10.1002/bltj.20298

David, O. N., Helou, A. M., & Rahim, N. Z. A. (2012). Model of perceived influence of academic performance using social networking. *International Journal of Computers and Technology*, *2*(2a), 24–29. doi:10.24297/ijct.v2i1.2612

De Souza, Z., & Dick, G. (2008). Information disclosure on myspace- the what, the why and the implications. *Pastoral Care in Education*, *26*(3), 143–157. doi:10.1080/02643940802246427

Domizi, D. P. (2013). Microblogging to foster connections and community in a weekly graduate seminar course. *TechTrends*, *57*(1), 43–51. doi:10.100711528-012-0630-0

Drury, G. (2008). Opinion piece: Social media: Should marketers engage and how can it be done effectively. *Journal of Direct*. *Data and Digital Marketing Practice*, *9*(3), 274–277. doi:10.1057/palgrave.dddmp.4350096

Duggan, M., & Brenner, J. (2013). *The demographics of social media users, 2012* (Vol. 14). Washington, DC: Pew Research Center's Internet & American Life Project.

Edom, B. O. (2012). *Principles of the use of the library*. Owerri: Springfield Publishers Ltd.

Eick, C. J., & King, D. T. (2012). Non-science majors' perceptions on the use of YouTube video to support learning in an integrated science lecture. *Journal of College Science Teaching*, *42*(1), 26–30.

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

Eke, H., N., Omekwu, C., O., & Odoh, J., N., (2014). The use of social networking sites among the undergraduate students of University of Nigeria, Nsukka. *Library Philosophy and Practice,* 1195.

Farkus, G. (2010). *Final report on Saugus Union School District's SWATTEC Program," Saugususd. org*. Irvine, CA: University of California.

Fewkes, A., & McCabe, M. (2012). Facebook: Learning Tool or Distraction? *Journal of Digital Learning in Teacher Education*, *28*(3). Retrieved on 24th of July, 2018 from http://eric.ed.gov/?id=EJ972449

Gao, L., Luo, T., & Zhang, K. (2012). Tweeting for learning: A critical analysis of research on microblogging in education published in 2008- 2011. *British Journal of Educational Technology*, *43*(5), 783–801. doi:10.1111/j.1467-8535.2012.01357.x

Geach, N., & Haralambous, N. (2009). Regulating harassment: Is the law fit for the Social networking age. *Journal of Criminal Law*, *73*(3), 241–257. doi:10.1350/jcla.2009.73.3.571

Gee, J. P. (2005). Semiotic Social Spaces and Affinity Spaces: From The Age of Mythology to Today's Schools. In D. Barton & K. Tusting (Eds.), Beyond communities of practice: Language, power and social context (pp. 214–232). Academic Press. doi:10.1017/CBO9780511610554.012

Giles, G., & Price, I. R. (2008). Adolescent computer use: Approach, avoidance, and parental control. *Australian Journal of Psychology*, *60*(2), 63–71. doi:10.1080/00049530701829896

Greenfield, P., & Subrahmanyam, K. (2008). Online communication and adolescent relationships. *The Future of Children*, *18*(1), 119–140. doi:10.1353/foc.0.0006 PMID:21338008

Gross, E. (2004). Adolescent Internet use: What we expect, what teens report. *Journal of Applied Developmental Psychology*, *25*(6), 633–649. doi:10.1016/j.appdev.2004.09.005

Hansen, D. L., Shneiderman, B., & Smith, M. A. (2010). *Analyzing social media networks with NodeXL: Insights from a connected world*. Morgan Kaufmann.

Henderson, A., & Bowley, R. (2010). Authentic dialogue? The role of "friendship" in a social media recruitment campaign. *Journal of Communication Management*, *14*(3), 237–257. doi:10.1108/13632541011064517

Idubor, I. (2015). Investigating social media usage and addiction levels among undergraduates in University of Ibadan, Nigeria. *British Journal of Education, Society &. Behavioral Science*, *7*(4), 291–301.

Itodo, D. S. (2012). Nigeria: Youths and Social Networking Obsession. Retrieved from AllAfrica.com/stories/20110140376.html

James. (2005). *The Wisdom of Crowds*. Anchor Books.

Jason, R. (2006). *Types of social networking sites*. Academic Press.

Jeong, T.G. (2005). The effect of internet addiction and self-control on achievement of elementary school children. *Korean Journal of Yeolin Education*, *5*(3).

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

Jiang, L. C., Bazarova, N. N., & Hancock, J. T. (2011). The disclosure-intimacy link in computer-mediated communication: An attributional extension of the hyperpersonal model. *Human Communication Research*, *37*(1), 58–77. doi:10.1111/j.1468-2958.2010.01393.x

Jonah, A. (2013). *Social networking: the new Nigeria.* The Bug, p. 2.

Junco, R., Heiberger, G., & Loken, E. (2011). The effect of Twitter on college student engagement and grades. *Journal of Computer Assisted Learning*, *27*(2), 119–132. doi:10.1111/j.1365-2729.2010.00387.x

Kaplan, A. M., & Haenlein, M. (2010). Users of the world, unite! The challenges and opportunities of Social Media. *Business Horizons*, *53*(1), 59–68. doi:10.1016/j.bushor.2009.09.003

Keen, A. (2007). *The cult of the amateur: How the democratization of the digital world is assaulting our economy, our culture, and our values*. New York: Doubleday Currency.

Kietzmann, J. H., Silvestre, B. S., McCarthy, I. P., & Pitt, L. F. (2012). Unpacking the social media phenomenon: Towards a research agenda. *Journal of Public Affairs*, *12*(2), 109–119. doi:10.1002/pa.1412

Kietzmannn, J., Silverstre, B., Mccarthy, I., & Leyland. (2012). Unpacking the social media phenomenon: towards a research agenda. *Journal of Public Affairs, 12*(2), 109-119.

Kuppuswamy, S., & Narayan, P. (2010). The Impact of Social Networking Websites on the Education of Youth. *International Journal of Virtual Communities and Social Networking*, *2*(1), 67–79. doi:10.4018/jvcsn.2010010105

Kuss D. J., & Griffiths M. D. (2011). Online Social Networking and Addiction-A Review of the Psychological Literature. *Int. J. Environ. Res. Public Health*, *8*, 3528-3552. . doi:10.3390/ijerph8093528

Lenhart, A., Purcell, K., Smith, A., & Zickuhr, K. (2010). *Social Media & Mobile Internet Use among Teens and Young Adults. Millennials.* Pew internet & American life project.

Li, N., & Kirkup, G. (2007). Gender and cultural differences in Internet use: A study of China and the UK. *Computers & Education*, *48*(2), 301–317. doi:10.1016/j.compedu.2005.01.007

Lin, G., & Subrahmanyam, K. (2007). Adolescents and the net: Internet use and wellbeing. *Adolescence*, *42*(168), 659–675. Retrieved from http://findarticles.com/ p/articles/ mi_m2248/ is_168_42 / ai_n27483301/ PMID:18229503

Livingstone, S. (2008). Taking risky opportunities in youthful content creation: Teenagers' use of social networking sites for intimacy, privacy and self-expression. *New Media & Society*, *10*(3), 393–411. doi:10.1177/1461444808089415

Livingstone, S. (2008). Taking risky opportunities in youthful content creation: Teenagers' use of social networking sites for intimacy, privacy and self-expression. *New Media & Society*, *10*(3), 393–411. doi:10.1177/1461444808089415

Lui, X., & LaRose, R. (2008). Does using the internet make people more satisfied with their lives? The effects of the internet on college students' school life satisfaction. *Cyberpsychology & Behavior*, *11*(3), 310–320. doi:10.1089/cpb.2007.0040 PMID:18537501

Mayfield, A. (2008). *What is social media?* Academic Press.

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

Mazman, S. G., & Usluel, Y. K. (2010). Modeling educational usage of Facebook. *Computers & Education*, *55*(2), 444–453. doi:10.1016/j.compedu.2010.02.008

Merten, M., & Williams, A. (2009). Adolescents' online social networking following the death of a peer. *Journal of Adolescent Research*, *24*(1), 67–90. doi:10.1177/0743558408328440

Mesch, G. (2009). Parental mediation, online activities, and cyberbullying. *Cyberpsychology & Behavior*, *12*(4), 387–392. doi:10.1089/cpb.2009.0068 PMID:19630583

Minocha, S. (2009). Role of social software tools in education: A literature review. *Education + Training*, *51*(5/6), 353–369. doi:10.1108/00400910910987174

Morahan-Martin, J., & Schumacher, P. (2000). Incidence and correlates of pathological Internet use among college students. *Computers in Human Behavior*, *16*(1), 13–29. doi:10.1016/S0747-5632(99)00049-7

Moran, M., Seaman, J., & Tinti-Kane, H. (2012). Blogs, wikis, podcasts and Facebook: How today's higher education faculty use social media. Boston, MA: Pearson Learning Solutions.

Na, Y. E. (2002). Gender differences in new media use and values mobile phones and the internet. *Korean Journal of Broadcasting and Telecommunication Studies*, *16*, 77–115.

Nadkarni, A., & Hofmann, S. G. (2012). Why do people use Facebook? *Personality and Individual Differences*, *52*(3), 243–249. doi:10.1016/j.paid.2011.11.007 PMID:22544987

Newman, E. (2008). Airwalk print lauds MySpace celebrities. *Brandweek*, *49*(10), 5.

Nicole, E. (2007). The benefits of Face book "Fiends;" Social Capital and College Students' Use of Online Social Network Sites. *Journal of Computer-Mediated Communication*.

Nnadozie, A. C. (2006). Collection development activities in selected academic Libraries in Nigeria. *Nigerbibilios*, *17*(1&2), 22–27.

Obi, N. C., Bulus, L. D., Adamu, G. M., & Sala'at, A. B. (2012). The Need for Safety Consciousness among Youths on Social Networking Sites. *Journal of Applied Science and Management*, *14*(1).

Oblinger, D. G., & Oblinger, J. L. (2005). *Educating the net generation*. Retrieved from www.educause.edu/educatingthenetgen/

Ogedebe, P. M., Emmanuel, J. A., & Musa, Y. (2012). A survey on Facebook and Academic Performance in Nigeria Universities. *International Journal of Engineering Research and Applications*, *2*, 788–797.

Olaniran, S. (2014). Social media and changing communication patterns among students: An analysis of twitter use by University of Jos students. *Covenant Journal of Communication*, *2*(1).

Oluwatoyin, A. E. (2011). ICT, CGPA: Consequences of Social Networks In An Internet Driven Learning Society. *International Journal of Computer Trends and Technology*, *2*(2), 11–32.

Osatuyi, B. (2013). Information sharing on social media sites. *Computers in Human Behavior*, *29*(6), 2622–2631. doi:10.1016/j.chb.2013.07.001

Oser, K. (2006). MySpace, big audience, big risks. *Advertising Age*, *77*(8), 3–25.

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

Parr, B. (2008). *Ben Parr's Entrepreneurial Musings*. Retrieved from http://benparr.com/2008/08/its-time-we-defined-social-media-no-more-arguing-heres-the-definition/

Pempek, T. A., Yermolayeva, Y. A., & Calvert, S. L. (2009). College students' social networking experiences on Facebook. *Journal of Applied Developmental Psychology*, *30*(3), 227–238. doi:10.1016/j.appdev.2008.12.010

Pempek, T. A., Yermolayeva, Y. A., & Calvert, S. L. (2009). College students' social networking experiences on facebook. *Journal of Applied Developmental Psychology*, *30*(3), 227–238. doi:10.1016/j.appdev.2008.12.010

Peter, J., Schouten, A., & Valkenburg, P. (2006). Friend networking sites and their relationship to adolescents' well-being and social self-esteem. *Cyberpsychology & Behavior*, *9*(5), 584–590. doi:10.1089/cpb.2006.9.584 PMID:17034326

Peter, J., & Valkenburg, P. (2009). Social consequences of the internet for adolescents: A decade of research. *Psychological Science*, *18*(1), 1–4. PMID:19152536

Quan-Haase, A., & Young, A. L. (2010). Uses and gratifications of social media: A comparison of facebook and instant messaging. *Bulletin of Science, Technology & Society*, *30*(5), 350–361. doi:10.1177/0270467610380009

Raacke, J., & Bonds-Raacke, J. (2008). MySpace and Facebook: Applying the uses and gratifications theory to exploring friend-networking sites. *Cyberpsychology & Behavior*, *11*(2), 169–174. doi:10.1089/cpb.2007.0056 PMID:18422409

Rafferty, F. (2009). Boys should be Boys-is it that Simple? *Education Journal*, *116*, 32–33.

Rainie, L., Smith, A., & Duggan, M. (2013). *Coming and going on Facebook*. Pew Research Center's Internet and American Life Project.

Rapacki, S. (2007). Social networking sites: Why teens need places like myspace. *Young Adult Library Services*, 28-30. Retrieved on 24th of June, 2018 from http://files.eric.ed.gov/fulltext/EJ991339.pdf

Roblyer, M. D., McDaniel, M., Webb, M., Herman, J., & Witty, J. V. (2010). Findings on Facebook in higher education: A comparison of college Faculty and student uses and perceptions of social networking sites. *Internet and Higher Education*, *13*(3), 134–140. doi:10.1016/j.iheduc.2010.03.002

Romero-Frías, E & Arquero Montaño, L. J (2012). *Exploring the use of social network sites on accounting education: a social constructivist approach.* Academic Press.

Rouis, S., Limayem, M., & Salehi-Sangari, E. (2011). *Impact of Facebook Usage on Students´Academic Achievement: Role of self-regulation and trust*. Academic Press.

Safko, L., & Brake, D. K. (2009). *The social media bible: Tactics, tools, and strategies for business success*. John Wiley & Sons.

Schulten, K. (2000). *The learning network blog*. Retrieved June 10 208 from learning blogs: nytimes.com/2009/12/21

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

Scott, P. R., & Jacka, J. M. (2011). *Auditing social media: A governance and risk guide*. John Wiley & Sons.

Sheldon, P. (2008). Student favorite: Facebook and motives for its use. *Southwestern Mass Communication Journal*, *23*(2), 39–53.

Sherer, P., & Shea, T. (2011). using online video to support student learning engagement. *College Teaching*, *59*(2), 56–59. doi:10.1080/87567555.2010.511313

Siibak, A. (2009). Constructing the self through the photo selection- Visual impression management on social networking websites. *Journal of Psychological Research on Cyberspace*, *3*(1), 1–6. Retrieved from http://www.cyberpsychology.eu/view.php

Sin, S. C. J., & Kim, K. S. (2013). International students' everyday life information seeking: The informational value of social networking sites. *Library & Information Science Research*, *35*(2), 107–116. doi:10.1016/j.lisr.2012.11.006

Smith, A. (2010). Social media & mobile internet use among teens and young adults. *Pew Research Center's Internet & American Life Project,* 1-37. Retrieved from http:// web.pewinterne t.org/~/ media/ Files /Reports/2010/PIP_Social _Media_and_Young_Adults_Report_Final_with_toplines.pdf

Social Media Online. (2011). *Social Media*. Accessed: www.creativemediafarm.com/information/glossary

Sorav, J. (2010). *Most Popular Social Networking Sites of the World*. Retrieved 28 January 2011 from: http://socialmediatoday.com/soravjain/195917/40-mostpopular-socialnetworking-sites-world

Sponcil, M., & Gitimu, P. (2013). Use of social media by college students: Relationship to communication and self-concept. *Journal of Technology Research*, *4*, 1.

Tınmaz, H. (2013). *Sosyal Ağ Web Siteleri ve Sosyal Ağların Eğitimde Kullanımı*. Kürşat Çağıltay ve Yüksel.

Trusov, M., Bucklin, R., & Pauwels, K. (2009). Effects of word of-mouth versus traditional marketing: Findings from an internet social networking site. *Journal of Marketing*, *73*(5), 90–102. doi:10.1509/jmkg.73.5.90

Tufekci, Z. (2008). Grooming, gossip, facebook, and myspace. *Information Communication and Society*, *11*(4), 544–564. doi:10.1080/13691180801999050

Tufekci, Z. (2008). Grooming, gossip, facebook, and myspace. *Information Communication and Society*, *11*(4), 544–564. doi:10.1080/13691180801999050

Turkle, S. (2004). Preference for online social interaction. *The Chronicle of Higher Education*.

Urista, M. A., Dong, Q., & Day, K. D. (2009). Explaining why young adults use myspace and facebook through uses and gratifications theory. *Human Communication*, *12*(2), 215–229.

Wang, Q., Chen, W., & Liang, Y. (2011). *The effects of social media on college students.* Academic Press.

West, A., Lewis, J., & Currie, P. (2009). Students' facebook 'friends': Public and private spheres. *Journal of Youth Studies*, *12*(6), 615–627. doi:10.1080/13676260902960752

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

Williams, Boyd, Densten, Chin, Diamond, & Morgenthaler, (2009). Social Networking Privacy Behaviors and Risks. In *Proceeding of CSIS Research Day*. Seidenberg School of CSIS, Pace University.

Wilson, T. (2012). *Community Reporting and Citizens Journalism: A Venn Diagram*. Discussion Paper from the Institute of Community Reporters- June 2012 Part of People's Voice Media Charity.

KEY TERMS AND DEFINITIONS

Media: Are all those media technologies that are intended to reach a large audience by mass communication. "They are messages communicated through a mass medium to a number of people.

Social Media: They are forms of electronic communication which facilitate interactive base on certain interests. Social media includes web and mobile technology.

Social Networking: The use of internet to make information about yourself available to other people especially people you share an interest with to send messages to them.

Social Networking Sites: A website where people put information about them and can send to others.

Tweets: A short message posted on Twitter (a micro blog).

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

Compilation of References

Abbas, J., Aman, J., Nurunnabi, M., & Bano, S. (2019). The impact of social media on learning behavior for sustainable education: Evidence of students from selected Universities in Pakistan. *Sustainability*, *11*(6), 1683. doi:10.3390u11061683

Abbitt, J., & Davis, D. (2010). The prevalence, perceived barriers and benefits of open source software in K-12 public schools in southwest Ohio. In D. Gibson & B. Dodge (Eds.), *Proceedings of SITE Conference 2010* (pp. 1296–1300). Chesapeake, VA: AACE. Retrieved from http://www.editlib.org/p/33536

Abdulrahman, A. B., Awuhe, B. T., & Ojobo, E. A. (2015). Resource sharing and networking among University Libraries in Northern Nigeria: A proposal. *International Journal of Innovative Research and Development*, *4*(10), 385–389.

Abdulsalam, K. A. & Azizah, A. R. (2013). Facebook in higher education: students' use and perceptions. *Advances in Information Sciences and Service Sciences*, *5*(15).

Abel, F., Marnzi, I., Nejdl, W., & Zerr, S. (2009). Sharing Distributed Resources in Learn- Web2.0. *Proc. of EC-TEL '09*.

Abram, S. (2005). *Web 2.0, Library 2.0 and Librarian 2.0. Preparing for the 2.0. World*. SirsiDynix OneSource, 2.1. Available at http: www.imakenews.com/sirsi/e_article000505688.cfm

Ackermann, E. (2001). Piaget's constructivism, Papert's constructionism: What's the difference? *Constructivism: Uses and Perspectives in Education, 1/2,* 85-94. Retrieved from http://learning.media.mit.edu/content/publications/EA.Piaget%20_%20Papert.pdf

Adamou, S., & Ntoka, L. (2017). *The impact of digital technologies on academic libraries: A study in Greece.* Retrieved on 3rd May, 2018 from http://lnu.diva-portal.org/smash/get/diva2:1129431/FULLTEXT01.pdf

Adane, L. O. (2013). *Factors affecting low academic achievement of pupils in Kemp Methodist Junior High School in Aburi, Eastern Region* (Master's thesis). University of Ghana, Legon. Retrieved from http://ugspace.ug.edu.gh

Adebayo, O., Isiakpona, C., & Ashaolu, A. O. (2018). *Consortium building for effective electronic resource provision in Nigerian university libraries: matters arising*. Retrieved from http://webcache.googleusercontent.com/search?q=cache:zs8PI_pDU8UJ:www.ijsk.org/uploads/3/1/1/7/3117743/289199969916844345_consortium_building_for_effective_electronic_resource_provision_in_nigerian_university_libraries.docx+&cd=1&hl=en&ct=clnk&gl=ng

Adedeji, G. M. A., Aderibigbe, M. O., & Onyibor, M. I. S. (2003). *An introduction to philosophy and logic*. Ibadan: Hope Publications.

Adegbilero-Iwari, I., & Hamzat, S. A. (2017). Library services platform path to cloud computing adoption in Nigerian academic libraries: A review. *Library Philosophy Practice*. Retrieved from https://digitalcommons.unl.edu/libphilprac/1658

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

Adegbilero-Iwari, I., & Hazmat, S. A. (2017). Library Services Platform Path to Cloud Computing Adoption in Nigerian Academic Libraries: A Review. *Library Philosophy and Practice (e-journal)*. Retrieved from https://digitalcommons.unl.edu/libphilprac/1658

Adegbore, A. M. (2011). University faculty use of electronic resources: A review of recent literature. *PNLA Quarterly*, *75*(4), 1–7.

Adegoke, K. A. (2015). Marketing of library and information services in university libraries: A case study of Usmanu-Danfodiyo University Library, Sokoto-Nigeria. *Intel Prop Rights, 3*, 143. Retrieved on 31st December, 2017 from https://www.omicsonline.org/open-access/marketing-of-library-and-information

Adekunmisi, S. R. (2013). Strategies for marketing library services and information products in Nigeria. *Global Advanced Research Journal, 2*(12), 240-245. Retrieved on 10st January, 2018 from file:///C:/Users/215080593/Downloads/strategies%20for%20marketing%20library%20s

Adekunmisi, N. S. R., & Odunewu, A. O. (2016). Web 2.0 and Nigerian Academic Librarian. *Journal of Education and Practice*, *7*(35).

Adekunmisi, S. R., Akinbode, R. O., & Oyedipe, W. J. (2017). Use of Smart Phone among Para-Professional Librarians in Olabisi Onabanjo University Library, Nigeria. *New Media and Mass Communication*, *59*, 1–10.

Adelabu, O. (2011). The role of social media in democratic mobilization in Nigeria. In *Media, terrorism and political communication in a multicultural environment conference proceedings*.

Adenubi, O. S., Olalekan, Y. S., Afolabi, A. A., & Opeoluwa, A. S. (2013). Online Social Networking and the Academic Achievement of University Students – The experience of selected Nigerian Universities. *Information and Knowledge Management, 3*(5). Retrieved from: www.iiste.org

Aderibigbe, O. A., & Farouk, B. L. (2017). Challenges on marketing of information resources and services in federal university libraries in North-West Zone of Nigeria. *International Journal of Academic Library and Information Science, 5*(3), 92-96. Retrieved on 31st December, 2017 fromhttp://www.academicresearchjournals.org/IJALIS/PDF/2017/May/Aderibigbe%20and

Adetimirin, A., & John, G. (2016). Use of social media for information dissemination by undergraduates in University of Ibadan, Nigeria. *Computer*, *4*(3), 12–20.

Adewoyin, O. O., Onuoha, U. D., & Ikonne, C. N. (2017). Social media use and service delivery by librarians in federal universities in south-west, Nigeria. *Library Philosophy and Practice (e-journal),* 1641. Retrieved from Https://Digitalcommons.Unl.Edu/Libphilprac/1641

Adimora, D. E., Ngwuchukwu, M. N., & Onuoha, J. C. (2016). Prevalence of social media networking on academic achievement and psychological health of undergraduate students in Federal Universities in Nigeria. *Global Journal of Psychology Research*: *New Trends and Issues*, *6*(3), 135–147.

Aduko, A. A., & Dadzie, P. (2013). Social media challenges in marketing of library and Information services at the Balme Library, University of Ghana. Innovation. *Journal of Appropriate Librarianship and Information Work in Southern Africa: Ethical Dimension of Social Media in the Information Society*, *47*, 213–230.

Afolayan, J. O., Ogundokun, R. O., Afolabi, A. G., & Sadiku, P. O. (2018). Emotional Intelligence, Effective Leadership and Organizational Productivity: Social Constructivism Theory Synthesis. In *Emotional Intelligence and Leadership in Nigeria Library and Information Science*. Offa.

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

Aghaunor, C. T., & Ekuobase, G. O. (2015). ICT social services and students' academic performance. A Multidisciplinary Journal Publication of the Faculty of Science, Adeleke University, Ede, Nigeria, 2, 29-46.

Agyen-Gyasi, K., Lamptey, R. B., & Frimpong, A. (2010). *Academic librarians' role in maximizing library use in Ghana.* Retrieved on 20th February, 2018 from http://ir.knust.edu.gh/bitstream/123456789/561/1/ACADEMIC%20 LIBRARIANS%20

Ahmed, I., & Qazi, T. F. (2011). A look out for academic impacts of Social networking sites (SNSs): A student based perspective. *African Journal of Business Management*, *5*(12), 5022–5031.

Ahsan, U., & Chand, S. (2012). The pattern of facebook usage and its impact on academic performance of university students: A gender based comparison. *Bulletin of Education and Research*, *34*(2), 19–28.

Aichner, T., & Jacob, F. (2015). Measuring the degree of corporate social media use. *International Journal of Market Research*, *57*(2), 257–275. doi:10.2501/IJMR-2015-018

Aina, L. O. (2013). *Information, Knowledge and the Gatekeeper*. The One Hundred and Thirty-Second Inaugural Lecture delivered at the University of Ilorin.

Aina, L. O. (2002). *Research in Information Sciences. An African Perspective*. Ibadan: Stirling Horden Publishers.

Aina, L. O. (2003). *Library and information science text for Africa*. Ibadan, Nigeria: Third World.

Aina, L. O. (2004). *Library and Information Science Text for Africa*. Ibadan: Third World Information Services.

Akinbode Rahmon, O., Adekunmisi Sowemimo, R., & Olasore Remilekun, E. (2016). Smart phone use among academic librarians in a state University library in Nigeria. *Global Advanced Research Journal of Educational Research and Review, 5*(3), 45-54.

Albarran, A. B., & Hutton, B. (2009). Young Latinos use of mobile phones: A cross-cultural study. *Revista de Comunicacion, 8*(1). 95-108. Available at http://beta.udep.edu.pe/comunicacion/rcom/pdf/2009/Art095- 108.pdf

Alfawareh, H. M., & Jusoh, S. (2014). Smartphones usage among university students: Najran University case. *International Journal of Academic Research*, *6*(2), 321–326. doi:10.7813/2075-4124.2014/6-2/B.48

Alican, C., & Saban, A. (2013). Ortaokul ve lisede öğrencim gören öğrencilerin sosyal medya kullanımına ilişkin tutumları: Ürgüp Örneği. *Sosyal Bilimler Enstitüsü Dergisi*, *35*(2), 1–14.

Almajalid, R. (2017). *A survey on the adoption of cloud computing in education sector.* arXiv preprint arXiv:1706.01136

Alonge, A. J. (2012). Social Media in Library and Centers. In A. Tella & A. O. Issa (Eds.), *Library and Information Science in Developing Countries: Contemporary Issues*. Philadelphia: IGI Global Publication. doi:10.4018/978-1-61350-335-5.ch021

Alotaibi, M. S. (2013). Utilizations of cloud computing in library and information centers: A theoretical study. *International Journal of Digital Library Services*, *3*(4), 83–93. Retrieved from http://www.ijodls.in/uploads/3/6/0/3/3603729/ dr._mish an_s._alotaibi_83-93.pdf

Al-rahmi, W. M., Othman, M. S., & Musa, M. A. (2014). The improvement of students' academic performance by using social media through collaborative learning in Malaysian higher education. *Asian Social Science*, *10*(8), 210.

Alzahrani, H. (2016). A brief survey of cloud computing. *International Research Journal, 16*(3).

American Library Association. (2014). *Podcasts: What are they and what role can librarians play?* Retrieved from http://www.ala.org/alcts/confevents/upcoming/webinar/101514

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

American Society of Health-System Pharmacists (ASHP). (2012). ASHP statement on use of social media by pharmacy professionals: developed through the ASHP pharmacy student forum and the ASHP section of pharmacy informatics and technology and approved by the ASHP Board of Directors on April 13, 2012, and by the ASHP House of Delegates on June 10, 2012. *American Journal of Health-System Pharmacy, 69*(23), 2095.

Amiribesheli, M., & Bouchachia, H. (2018). A tailored smart home for dementia care. *Journal of Ambient Intelligence and Humanized Computing*, 1–28.

Amuni, S. I., Adetoro, N., & Sule, O. E. (2014). Mobile technology and information services provision: Perception of library users in selected universities. *Global Educational Journal of Library and Information Science*, *2*(2), 37–50.

Anafo, P. (2014). Marketing strategies for information services: A case study of the institute of chartered accountants (Ghana) library and information services. *Library Philosophy and Practice*. Retrieved on 05th January, 2018 from https://digitalcommons.unl.edu/cgi/viewcontent.cgi?referer=https://www.google.co.za/

Anbu, K. J. P., & Kataria, S. (2015). Access to library resources through portable devices: A pre-design prototype for creating library websites. *International Symposium on Emerging Trends and Tsechnologies in Libraries and Information Services*. 10.1109/ETTLIS.2015.7048162

Anderson, C. (2012). Makers: The New Industrial Revolution. London: Random House Business Books.

Anderson, T. (2004). Towards a theory of online learning. *Theory and Practice of Online Learning, 2*, 109-119.

Anderson, K., & Still, J. (2011). An introduction to Google Plus. *Library Hi Tech News*, *28*(8), 7–10. doi:10.1108/07419051111187842

Angelini, F. (2018, August 5). Culture. *The Sunday Times*.

Angulo, J., Bermudo, P. J., Buñag, W., Clapano, E., Cuy, N., Mendoza, E. J., & Sicat, R. (2011). *The Perpetualite: Identity and Dignity*. Mindshapers Co., Inc.

Ansari, M. S., & Tripathi, A. (2017). Use of whatsapp for effective delivery of Library and Information Services. *DESIDOC Journal of Library and Information Technology*, *37*(5), 360. doi:10.14429/djlit.37.11090

Anttiroiko, A., & Savolainen, R. (2011). Towards Library 2.0: The adoption of Web 2.0 Technologies in public libraries. Libri. *International Journal of Libraries & Information Services*, *61*(2), 87–99.

Anunobi, C. V., & Ogbonna, A. U. (2012). Web 2.0 use by librarians in a state in Nigeria. *Developing Country Studies*, *2*(5), 57–66.

Apostu, A., Puican, F., Ularu, G., Suciu, G., & Todoran, G. (2013). Study on advantages and disadvantages of cloud computing–the advantages of telemetry applications in the cloud. Recent Advances in Applied Computer Science and Digital Services, 118-123.

Arif, A. and Mahmood, K. (2010). Allama Iqbal Open University library services to teachers: A survey. *Pakistan Library & Information Science Journal, 41*(4).

Aristovnik, A., Tomazevic, N., Kerzic, D., & Umek, L. (2017). The impact of demographic factors on selected aspects of e-learning in higher education. *International Journal of Information & Learning Technology*, *34*(2), 114–121. doi:10.1108/IJILT-09-2016-0045

Arnett, J.J. (2000). Emerging adulthood: A theory of development from the late teens through the twenties. *American Psychologist*, *55*(5), 469-480. doi: 066x.55.5.469 doi:10.1037/0003

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

Arokia, P., Rajan, R., & Shanmugapriyaa, S. (2012). Evolution of cloud storage as cloud computing infrastructure service. *IOSR Journal of Computer Engineering*, *1*(1), 38–45. doi:10.9790/0661-0113845

Arumugaraja, M., GugaPriya, B., & Soundarya, M. (2014). The Library Management Robot. *International Journal Of Engineering And Computer Science*, *3*(3), 5008–5012.

Asabere, N. Y. (2012). *A research analysis of online social networking sites (SNSs) and social behaviour at University of Ghana (UG)*. Legon, Accra, Ghana. In International Journal of Science and Technology.

Asemah, E. S., & Edegoh, L. O. N. (2013). Influence of social media on the academic performance of the undergraduate students of Kogi State University, Anyigba, Nigeria. *Journal of Research in Humanities and Social Sciences*, *3*(12), 90–91.

Ashikuzzaman, M. (2017). *Traditional methods of CAS and SDI*. Retrieved from http://www.lisbdnet.com/traditional-methods-cas-sdi/

Ashikuzzaman, M. D. (2015). *Resource sharing in library: A brief information*. Retrieved http://www.lisbdnet.com/resource-sharing-in-library-brief/

Attai, D. J., Cowher, M. S., Al-Hamadani, M., Schoger, J. M., Staley, A. C., & Landercasper, J. (2015). Twitter social media is an effective tool for breast cancer patient education and support: Patient-reported outcomes by survey. *Journal of Medical Internet Research*, *17*(7), e188. doi:10.2196/jmir.4721 PMID:26228234

Atulomah, B. C., & Onuoha, U. D. (2011). Harnessing collective intelligence through online social networks: A study of librarians in private Universities in Ogun state, Nigeria. *Ozean Journal of Social Sciences*, *4*(2), 71–83.

Austin, T., & de Jong, W. (2008). *Rethinking documentary: New perspectives, new practices*. London: Open University Press.

Aymerich, F. M., Fenu, G., & Surcis, S. (2008). An Approach to a Cloud Computing Network. *1st International Conference on the Applications of Digital Information and Web Technologies*, 120-125. 10.1109/ICADIWT.2008.4664329

Bachchhav, K. P. (2016). *Information Retrieval: search process, techniques and strategies*. Retrieved on 29th of July from: www.ijnglt.com

Bae, P., Mcgivney, J., Posner, B., & Schmidt, L. (2017). *Library Information and Resource Sharing: Transforming Services and Collections*. Sharing Breakthroughs - OCLC Conference.

Bagley, C. (2012). What is a makerspace? Creativity in the library. *ALA TechSource*. Retrieved from http://www.alatechsource.org/blog/2012/12/what-is-a-makerspace-creativity-in-the-library.html

Baker, L. R., & Oswald, D. L. (2010). Shyness and online social networking services. *Journal of Social and Personal Relationships*, *27*(7), 873–889. doi:10.1177/0265407510375261

Baker, W. M., Lusk, E. J., & Neuhauser, K. L. (2012). On the use of cell phones and other electronic devices in the classroom: Evidence from a survey of faculty and students. *Journal of Education for Business*, *87*(5), 275–289. doi:10.1080/08832323.2011.622814

Balakrishnan, V., & Raj, R. G. (2012). Exploring the relationship between urbanized Malaysian youth and their mobile phones: A quantitative approach. *Telematics and Informatics*, *29*(3), 263–272. doi:10.1016/j.tele.2011.11.001

Balcikanli, C. (2009). Long live YouTube: L2 stories about YouTube in language learning. *E-Proceedings of the International Online Language Conference (IOLC)*, 91-96.

Banerjee, P. (2009). An intelligent IT infrastructure for the future. *15th International Symposium on High-Performance Computer Architecture*. *Proceedings*, *3*, 14–18.

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

Barclay, D., & Scott, E. (2012). Directions to library wayfinding. *American Libraries*, *43*(3/4), 36.

Barker, V. (2009). Older adolescents' motivations for social network site use: The influence of gender, group identity, and collective self-esteem. *Cyberpsychology & Behavior*, *12*(2), 209–213. doi:10.1089/cpb.2008.0228 PMID:19250021

Barniskis, S. C. (2016). *Creating Space: The Impacts of Spatial Arrangements in Public Library Makerspaces*. Academic Press.

Baro, E. E., Idiodi, E.O., & Godfrey, V.Z. (n.d.). *Awareness and use of web 2.0 tools by librarians in University libraries in Nigeria.* Available at http://www.emeraldinsight.com/doi/abs/10.1108/OCLC-12-2012-0042

Barrett, H. (2006). Researching and evaluating digital storytelling as a deep learning tool. *Society for Information Technology & Teacher Education International Conference, 2006*(1), 647-654.

Bastek, N. (2012). *Online Vs. Print Publishing. Writing@CSU.* Colorado State University. Available at http://writing.colostate.edu/guides/guide.cfm?guideid=37

Bauman, R. (2008). The Philology of the Vernacular. *Journal of Folklore Research*, *45*(1), 29–36. doi:10.2979/JFR.2008.45.1.29

Baumgartner, P., Naust, V., & Canals, A. (2007). *Open educational practices and resources: OLCOS roadmap 2012.* Retrieved from http://hdl.handle.net/10760/9178

Baym, N. K., Zhang, Y. B., Kunkel, A., Ledbetter, A., & Mei-Chen, L. (2007). Relational quality and media use in interpersonal relationships. *New Media & Society*, *9*(5), 735–752. doi:10.1177/1461444807080339

Baym, N. K., Zhang, Y. B., & Lin, M. (2004). Social interactions across media. *New Media & Society*, *6*(3), 299–318. doi:10.1177/1461444804041438

BBC. (2014). *Ethics: a general introduction.* Retrieved http://www.bbc.co.uk/ethics/introduction/intro_1.shtml

Bennis, W. (2002). Become a tomorrow leader. In L. C. Spears & M. Lawrence (Eds.), *Focus on leadership: Servant-leadership for the 21st Century* (pp. 101–109). New York: John Wiley & Sons.

Benz, D., Hotho, A., Jäschke, R., Krause, B., Mitzlaff, F., Schmitz, C., & Stumme, G. (2010). The Social Bookmark and Publication Management System BibSonomy. *The VLDB Journal*, *19*(6), 849–875. doi:10.100700778-010-0208-4

Bethesda. (2010). *Statement on Open Access Publishing*. Available at http://www.earlham.edu/~p eters/fos/bethesda.htm

Bharathi, G. J. (2018). *Cloud computing: IT0530*. Retrieved from www.srmuniv.ac.in/sites/default/files/files/unit-IITO530.pdf

Bhardwaj, R. K. (2016). Marketing of library resources and services: A structured literature review. *DESIDOC Journal of Library and Information Technology*, *36*(3), 119–125. doi:10.14429/djlit.36.3.10027

Bhatt, R. K., Kumar, A., & Yusuf, M. (2016). Marketing of LIS products and services in select economics libraries in Delhi. *DESIDOC Journal of Library & Information Technology, 36*(3). Retrieved on 30th December, 2017 from file:///C:/Users/TEMP.UKZN.021/Downloads/9794-27723-1-PB.pdf

Bhavan, B. R. A., & Narayana, P. (2011). *Resource Sharing, Library Networks and Consortia. National Conference on Collection Management in Changing Context: Problems and Prospects*. Kuvempu University, Shivamogga, India.

Bicena, H., & Kocakoyunb, S. (2013). The Evaluation Of The Most Used Mobile Devices Applications By Students. 2nd Cyprus International Conference on Educational Research, (CY-ICER 2013). *Procedia: Social and Behavioral Sciences*, *89*, 756–760. doi:10.1016/j.sbspro.2013.08.928

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

Bik, H. M., & Goldstein, M. C. (2013). An introduction to social media for scientists. *PLoS Biology*, *11*(4), e1001535. doi:10.1371/journal.pbio.1001535 PMID:23630451

Bilandzic, H., Patriarche, G., & Traudt, P. J. (Eds.). (2012). *The social use of media: cultural and social scientific perspectives on audience research*. Intellect Books.

Bishop, T., & Rowley, J. (2012). Digital marketing in independent libraries in the United Kingdom. *Journal of Librarianship and Information Science*, *45*(4), 323–334. doi:10.1177/0961000612453473

Bjork, B. (2004). Open Access to scientific publications—an analysis of the barriers to change. *Information Research*, *9*(2), 3–14.

Blanchard, K. H., Oncken, W. Jr, & Burows, H. (1991). *The One Minute Manager Meets the Monkey*. New York: William Morrow & Co.

Blowers, H. (2010). From Realities to Values: A Strategy for Digital Natives. *Computers in Libraries*, *30*(4), 6–10.

Blumenstock, J. J., & Eagle, N. (2010). Mobile Divides: Gender, Socio-economic Status, and Mobile Phone use in Rwanda. U.C. Berkeley School of Information Berkeley.

Boateng, F., & Quan Liu, Y. (2014). Web 2.0 applications 'usage and trends in top US Academic libraries. *Library Hi Tech*, *32*(1), 120–138. doi:10.1108/LHT-07-2013-0093

Bomhold, C. (2013). Mobile Services at Academic Libraries: Meeting the Users' needs? *Library Hi Tech*, *32*(2), 336–345. doi:10.1108/LHT-10-2013-0138

Bomhold, C. R. (2013). Educational use of smartphone technology: A survey of mobile phone application use by undergraduate university students. Program: Electronic Library&. *Information Systems*, *47*(4), 424.

Bonds-Raacke, J., & Raacke, J. (2008). MySpace and facebook: Applying the uses and gratifications theory to exploring friend-networking sites. *Cyberpsychology & Behavior*, *11*(2), 169–174. doi:10.1089/cpb.2007.0056 PMID:18422409

Bondy, E., Shannon, D., Eda, M., & Munarriz-Diaz, R. (2017). Recentering job-embedded graduate education for practicing teachers. *Teacher Education and Practice*, *30*(1), 38–57.

Boneva, B., Kraut, R., & Frohlich, D. (2001). Using e-mail for personal relationships: The difference gender makes. *The American Behavioral Scientist*, *45*(3), 530–549. doi:10.1177/00027640121957204

Borek, D. (2006). Perspective on building consortium between libraries and other agencies. *Library Trends*, *54*(3), 448–462. doi:10.1353/lib.2006.0023

Boruff, J. T., & Stories, D. (2014). Mobile devices in Medicine: Survey of How Medical Student, Residents and Faculty Use Smart Phones and Other Mobile Devices to Find Information. *Journal of the Medical Library Association: JMLA*, *102*(1), 22–30. doi:10.3163/1536-5050.102.1.006 PMID:24415916

Bosman, E., & Rusinek, C. (1997). Creating the user-friendly library by evaluating patron perception of signage. *RSR. Reference Services Review*, *25*(1), 71–82. doi:10.1108/00907329710306599

Bothma, T., Cosijn, E., Fourie, I., & Penzhorn, C. (2014). *Navigating information literacy: Your information society survival toolkit* (4th ed.). Pearson.

Boulos, M. N. K., Wheeler, S., Tavares, C., & Jones, R. (2011). How Smart Phones are Changing the Face of Mobile and Participatory Healthcare: An overview, with example from Ecaalyx. *Biomedical Engineering Online*, *10*(24), 1–4. Retrieved from http://wwwbiomedical-engineering-online.com PMID:21466669

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

Bowen, G. (2008). Preventing school dropout: The eco-interactional developmental model of school success. *Prevention Researcher*, *16*, 3–8.

Boyd, D. (2006). A Blogger's Blog: Exploring the Definition of a Medium. *Reconstruction, 6*(4). Retrieved from http://reconstruction.eserver.org/064/boyd.shtml

Boyd, D. M., & Ellison, N. B. (2007). *Social network sites: definition, history, and scholarship*. Academic Press.

Boyd, D. M., & Ellison, N. B. (2008). Social network sites: Definition, history, and scholarship. *Journal of Computer-Mediated Communication*, *13*(1), 210–230. doi:10.1111/j.1083-6101.2007.00393.x

Bradley, P. (2007). *How to use web 2.0 in your library*. London: Facet Publishing.

Branigan-Pipe, Z. (2017). *Making a Makerspace: The Tools*. The Spaces and the Theories.

Bransford, J. D., Brown, A. L., & Cocking, R. R. (Eds.). (1997). *How People Learn: Brain, Mind, Experience, and School*. Washington, DC: National Academy Press.

Brasg, I. (2013). *CFMS guide to medical professionalism: recommendations for social media*. Ottawa: Canadian Federation of Medical Students.

Breeding, M. (2014). The Systems Librarian: Library Technology Forecast for 2015 and Beyond. *Computer Libraries*, *34*(10).

Brenner, M. (2015). *Digital Publishing for the 21st Century*. Retrieved from https://www.ceros.com/originals/digital-publishing-for-the-21st-century/

Brenner, J., & Smith, A. (2013). *72% of online adults are social networking site users*. Washington, DC: Pew Internet & American Life Project.

Britannica Academic. (2017). Documentary Film, Britannica Academic. *Encyclopædia Britannica.* Available: http://academic.eb.com.ezproxy.arcada.fi:2048/levels/collegiate/article/documentaryfilm/30760

British Educational Communications and Technology Agency (BECTA). (2005). *Open source software in schools: A study of the spectrum of use and related ICT infrastructure costs*. Coventry, UK: BECTA. Retrieved from http://www.openskm.com/doc/ oss_study_spectrum.pdf

Britton, L. (2012). A Fabulous Laboratory: The Makerspace at the Fayetteville Free Library. *Public Libraries*, *51*, 30–33.

Bronner, S. J. (2006). Folk logic: Interpretation and explanation in folkloristics. *Western Folklore*, *65*, 401–434.

Brown, J., & Metcalf, D. (2016). *Mobile learning update, Eliott Masie's Learning Consortium Perspectives, 2015*. Retrieved from http://209.151.89.205/usdla.org/public_html/cms/mini websites/old/Mobile Learning Update.pdf

Brown, S., & Swan, A. (2007). *Researchers' use of academic libraries and their services: a report commissioned by the Research Information Network and the Consortium of Research Libraries.* Retrieved on 3rd April, 2018 from http://www.rin.ac.uk/system/files/attachments/Researchers-libraries-services-report.pdf

Brown, K., Campbell, S. W., & Ling, R. (2011). Mobile phones bridging the digital divide for teens in the US? *Future Internet*, *3*(2), 144–158. doi:10.3390/fi3020144

Brown, M. (2007). New Gadgets worth Exploring. *Library Hi Tech News*, *24*(8), 10–13. doi:10.1108/07419050710835956

Bruns, A. (2008). *Blogs, Wikipedia, Second life, and Beyond: from production to produsage*. Academic Press.

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

Bryant, J. A., Sanders-Jackson, A., & Smallwood, A. (2006). IMing, text messaging, and adolescent social networks. *Journal of Computer-Mediated Communication*, *11*, 10. Retrieved from http://jcmc.indiana.edu/vol11/issue2/Bryant.html

Bryer, T. A., & Zavattaro, S. M. (2011). Social media and public administration: Theoretical dimensions and introduction to the symposium. *Administrative Theory & Praxis*, *33*(3), 325–340. doi:10.2753/ATP1084-1806330301

Bryer, T., & Zavattaro, S. (2011). Social media and public administration: Theoretical dimensions and introduction to symposium. *Administrative Theory & Praxis*, *33*(3), 327.

Buchholz, I. M. (2011). *Provision of access to information in academic libraries in southern Africa: Two case studies*. University of South Africa.

Buckley, B. (2008). Sue Tube: Web 2.0 and copyright infringement. *The Columbia Journal of Law and the Arts*, *31*(2), 235–263.

Bucznski, J. A. (2008). Libraries begin to engage their menacing mobile phone hordes without Shhhhh! *Internet Reference Services Quarterly*, *13*(2-3), 261–269. doi:10.1080/10875300802103916

Buhari, S. R., & Ashara, B. H. (2014). Use of social media among students of Nigerian polytechnic. *International Conference on Communication, Media, Technology and Design*, 302-305.

Burchardt, J. (2014). Researchers outside APC-financed open access: Implications for scholars without a paying institution. *SAGE Open*, *4*(4). doi:10.1177/2158244014551714

Burke, J. (2015). *Making sense: Can makerspaces work in academic libraries?* Paper presented at ACRL 2015. Retrieved from http://www.ala.org/acrl/acrl/conferences/acrl2015/papers

Burke, J. (2015). Making Sense: Can Makerspaces Work in Academic Libraries? *Association of College & Research Libraries*, *35*, 497–504.

Burnaby Public Library. (2018). *Choosing an e-book reader*. Retrieved from https://www.bpl.bc.ca/news/choosing-an-e-book-reader

BusinessWeek. (2005). MySpace: WhoseSpace? *BusinessWeek.*

Buyya, R., & Sukumar, K. (2011). Platforms for building and deploying applications for cloud computing. *CSI Communications*, *35*(1), 6–11. Retrieved from www.csi-India.org

Cabral. (2011). Is Generation Y Addicted to Social Media? *The Elon Journal of Undergraduate Research in Communications*, *2*(1), 5-14.

Campbell, L., Moreno, M. A., Pumper, M., & Evans, Y. (2016). Social media use by physicians: A qualitative study of the new frontier of medicine. *BMC Medical Informatics and Decision Making*, *16*(1), 91. doi:10.118612911-016-0327-y PMID:27418201

Cao, Y., & Hong, P. (2011). Antecedents and consequences of social media utilization in college teaching: A proposed model with mixed-methods investigation. *On the Horizon*, *19*(4), 297–306. doi:10.1108/10748121111179420

Carney, S., Koufogiannakis, D., & Ryan, P. (2004). Library services for users of personal digital assistants: A needs assessment and program evaluation. *Portal (Baltimore, Md.)*, *4*(3), 393–406.

Casali, G. L., Perano, M., & Abbate, T. (2017). Understanding roles and functions of academic libraries as innovation intermediaries within the service-dominant logic perspective: An Australian case study. *Journal of Library Administration*, *57*(2), 135–150. doi:10.1080/01930826.2016.1211400

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

Case, D. O. (2007). *Looking for information: a survey of research on information seeking, needs and behavior* (2nd ed.). Boston, MA: Elsevier/Academic Press.

Chadwell, F. A., & Sutton, S. C. (2014). The future of open access and library publishing. *New Library World*, *115*(5/6), 225–236. doi:10.1108/NLW-05-2014-0049

Chandratre, S., & Chandratre, M. S. (2015). Marketing of library and information services. *Journal of Commerce & Management Thought*, *6*(1), 162–175. doi:10.5958/0976-478x.2015.00011.7

Chan, K., Evans, S., Ng, Y. L., Chiu, M. Y. L., & Huxley, P. J. (2014). A concept mapping study on social inclusion in Hong Kong. *Social Indicators Research*, *119*(1), 121–137. doi:10.100711205-013-0498-1

Chatterjee, A. (2007). *Resource sharing among libraries in digital era: role of consortium*. Retrieved from www.isical.ac.in/serial/consortia/CBSOR-02.pdf

Chatterjee, A. (2016). *Resource sharing among libraries in digital era: role of consortia*. Dept. of Library & Information Science, Jadavpur University. Retrieved from http://www.isical.ac.in/~serial/consortia/CBSOR-02.pdf

Chauhan, B., & Janis Coffin, D.O. (2012). Social media and you: what every physician needs to know. *The Journal of Medical Practice Management: MPM, 28*(3), 206.

Chegwe, A. O., & Anaehobi, S. E. (2015). Academic Librarians Perception and Attitude towards Marketing of Library Services in Delta State, Nigeria. *Library Philosophy and Practice*. Retrieved on 28th December, 2017 from http://digitalcommons.unl.edu/cgi/viewcontent.cgi?article=3434&context=libphilprac

Chen, B., & Denoyelles, A. (2016). Exploring students' mobile learning practices in higher education. *EDUCASE Rev. Online*. Retrieved from http://mimbumobile.com/wp-content/uploads/2014/07/University Study-on-Mobile.pdf

Chen, S. (2013). Promoting resource sharing through consortia: A case study of Shanghai Library. *Interlending & Document Supply*, *41*(2), 59–61. doi:10.1108/ILDS-09-2012-0030

Cherry, J. M., & Duff, W. M. (2002) Studying digital library users over time: a follow up survey of early Canadian online. *Information Research*, *7*(2). Retrieved from http://informationr.net/ir/7-2/paper123.htmlSs

Choi, J., & Kang, W. (2014). A dynamic examination motives forusing social media and social media usage among undergraduate students. A latent class analysis. *Procedia: Social and Behavioral Sciences*, *131*, 202–210. doi:10.1016/j.sbspro.2014.04.105

Choney, S. (2010). *Facebook Use Can Lower Grades by 20 Percent, Study Says*. Retrieved from http://www.msnbc.com/id/39038581/ns.technology_and_science-tech_and_gadgets/.Retrieved

Chretien, K. C., & Kind, T. (2013). Social Media and Clinical Care. *Circulation*, *127*(13), 1413–1421. doi:10.1161/CIRCULATIONAHA.112.128017 PMID:23547180

Christopher, S. G. K. (2010). Issues in Information behavior in social media. *Libers.*, *24*(2), 75–96.

Chu, C.-C. W., Yang, C. T., Lu, C. W., Chang, C. H., Chen, J. N., Hsiung, P. A., & Lee, H. M. (2012). Cloud computing in Taiwan. *Computer, 45*(6), 48–56. Retrieved 17th April, 2018from: http://ieeexplore.ieee.org/lpdocs/epic03/wrapper.htm?arnumber=6197169

Chukwuemeka, O. (2013). Environmental influence on academic performance of secondary school students in Port Harcourt Local Government Area of Rivers State. *Journal of Economics and Sustainable Development*, *4*(12), 34–38.

Chukwuemeka, O. A., & Madu, U. W. (2017). Mobile Information Services Delivery by Librarians in University Libraries in Nigeria: Some Observations. *Automatic Control and Information Sciences*, *3*(1), 5–7.

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

Cieplak, T., & Malec, M. (2014). Applications of cloud computing services in education: Case study. *Advances in Science and Technology Research Journal*, *8*(24), 55–60. doi:10.12913/22998624/568

Cisco. (2013). *The cloud in Africa: reality check 2013*. Retrieved December 13, 2013 from: http://www.cisco.com/web/ZA/press/2013/112813.html

Clay, J. (2012). *Preparing for Effective Adoption and Use of E-books in Education. Other. UKOLN*. University of Bath.

Cloud Academy. (2018). *Cloud computing architecture: An overview*. Retrieved from https://cloudacademy.com/blog/cloud-computing-architecture-an-overview

CNET. (2017). *Best e-book reader of 2017*. Retrieved from https://www.pcmag.com/roundup/294182/the-best-ebook-readers

Collections, J. I. S. C. (2009). *National E-books Observatory Project: Key Findings and Recommendations (Final Report).* Retrieved from http://observatory.jisce-books.org/files/ 2011/08/JISC-national-e-books-observatoryproject-final-report.pdf

Collins, G., & Quan-Haase, A. (2012). Social Media and academic libraries: Current trends and Future challenges. *The American Society for Information Science and Technology*, *49*(1), 1–4. doi:10.1002/meet.14504901272

Collins, J. C. (2001). *Good to great: Why some companies make the leap-- and others don't*. New York: Harper Business.

Colorado State University. (2011). *E-Books and e-readers in Public and Academic Libraries*. Retrieved from https://www.poudrelibraries.org/about/pdf/ereader-report-2011extended.pdf

Conn, K., & Brady, K. P. (2008). Myspace and its relatives: The cyberbullying dilemma. *West's Education Law Reporter*, 1-7. Available at http://www.webcitation.org/5hGReihs

Connaway, L. S. (2015). *The library in the life of the user: Engaging with people where they live and learn*. OCLC Online Computer Library Center, Inc. Retrieved on 16th May, 2018 from https://www.oclc.org/content/dam/research/publications/2015/oclcresearch-library-in

Connor, J. C. (2000). It wasn't about race. Or was it? *Harvard Business Review*, *43*(2), 37–46. PMID:11143153

Convertive. (2011). *Using social media in major library systems*. Retrieved from http://www.convertiv.com/using-social-media-in-a-major-library-system/

Cook, J., Whittaker, A. D., Thieme, R. H., Smith, O. R., & Salvendy, G. (1988). Human Intelligence Models and Their Implications for Expert System Structure and Research. *Behaviour & Information Technology*, (7): 424–425.

Corrado, E. M., & Moulaison, H. L. (2012). *The library cloud: Pros and cons*. Retrieved from http://www.thedigitalshift.com/2012/03/software/the-library-cloud-pros-and-cons/

Counte, S. L. (2018). *Bringing Library Services to Mobile Devices*. Retrieved from http://libraryjuiceacademy.com/077-mobile-devices.php

Coursaris, C. K., & Liu, M. (2009). An analysis of social support exchanges in online HIV/AIDS self-help groups. *Computers in Human Behavior*, *25*(4), 911–918. doi:10.1016/j.chb.2009.03.006

Courtney, N. (2007). *Library 2.0 and beyond: Innovative technologies and tomorrow's user*. Westport, CT: Libraries Unlimited.

Coyle, C., & Vaughn, H. (2008). summer). Social networking: Communication revolution or evolution. *Bell Labs Technical Journal*, *13*(2), 13–17. doi:10.1002/bltj.20298

Craig, E., Diana, M., & Florence, T. (2009). Cloud computing an overview. *MIS*, *641*, 6.

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

Crawford, A. (Ed.). (2015). *The meaning of the library: A cultural history.* Princeton University Press. Retrieved on 27th April, 2018 from https://www.ideals.illinois.edu/bitstream/handle/2142/79053/John%20P.%20Wilkin%2

Creaser, C. (2010). Open access to research outputs—institutional policies and researchers' views: results from two complementary surveys. *New Review of Academic Librarianship, 16*(1), 4 – 25. doi:10.1080/13614530903162854

Creeger, M. (2009). CTO roundtable: Cloud computing. *Communications of the ACM*, *52*(8), 50–56. doi:10.1145/1536616.1536633

Cummings, J., Merril, A., & Boreli, S. (2010). The use of handheld mobile devices: Their impact and implications for library services. *Library Hi Tech*, *28*(1), 22–40. doi:10.1108/07378831011026670

Cyberpassionteam. (2011). *History of cloud computing*. Retrieved from: http://yourravi.com/history-of-cloud-computing/

Dahlstrom, E. (2012). *ECAR study of undergraduate students and information technology*. Louisville, CO: EDUCAUSE Center for Applied Research.

Dahunsi, F. M., & Owoseni, T. M. (2015). Cloud Computing in Nigeria: The Cloud Ecosystem Perspective. *Nigerian Journal of Technology*, *34*(1), 209–216. doi:10.4314/njt.v34i1.26

Daluba, N. E., & Maxwell, C.E.O. (2013). *Effect of social media on the use of academic library by undergraduate*. Academic Press.

Dankowski, T. (2013). How libraries are using social media: Expanding online toolkits to Promote advocacy. *American Libraries*, *44*(5), 38–41.

Das, A. K. (2015). Open Access: History and Developments. In S. Mishra & M. P. Satija (Eds.), *Introduction to Open Access* (p. 17). Paris: UNESCO.

David, O. N., Helou, A. M., & Rahim, N. Z. A. (2012). Model of perceived influence of academic performance using social networking. *International Journal of Computers and Technology*, *2*(2a), 24–29. doi:10.24297/ijct.v2i1.2612

Davies. (2012). Mobile Medical Education (MOMED) - How mobile Information Resources Contribute toLearning for Undergraduate Clinical Students. A mixed Method Study. *Biomed Central, 12*(1), 1-11. Retrieved from: http://www.biomedcentral.com/ 1472-6920/12/1/prepup

De Argaez, E. (2018). *Internet world penetration rate*. Retrieved on 19th April, 2018 from https://www.internetworldstats.com/stats.htm

De Souza, Z., & Dick, G. (2008). Information disclosure on myspace- the what, the why and the implications. *Pastoral Care in Education*, *26*(3), 143–157. doi:10.1080/02643940802246427

Decker, E. N. (2017). Encouraging continuous learning for librarians and library staff. *Library Management*, *38*(6/7), 286–293. doi:10.1108/LM-10-2016-0078

Deepak, K. C. (2017). Evaluation of Moodle features at Kajaani University of Applied Sciences: Case study. *Procedia Computer Science*, *116*, 121–128. doi:10.1016/j.procs.2017.10.021

DeepDyve. (2014). *Read and Share from Thousands of the Top Scholarly Journals*. Available at http://www.deepdyve.com/

DeLaMare Science & Engineering Library. (2017). *Lending Technology*. Accessed January 30, 2017, http://guides.library.unr.edu/equipment-checkout/delamare

DeLaMare Science & Engineering Library. (2017). *Making Resources*. Accessed January 30, 2017, http://guides.library.unr.edu/making-resources

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

Delic, K. A., & Riley, J. A. (2009). Enterprise Knowledge Clouds: Next Generation KM Systems. *International Conference on Information, Process, and Knowledge Management*, 49-53. 10.1109/eKNOW.2009.28

DeSouza, R., & Jyoti Dutta, M. (2008). Global and local networking for HIV/AIDS prevention: The case of the Saathii E-forum. *Journal of Health Communication*, *13*(4), 326–344. doi:10.1080/10810730802063363 PMID:18569364

Dey, S., Satpathy, D., & Chandra, K. (2014). *Marketing of information services in libraries: Trends in library technology & marketing of information*. Retrieved on 20th April, 2018 from https://ssrn.com/abstract=2977896

Dhar, P. (2012). Cloud computing and its applications in the world of networking. *International Journal of Computer Science Issues, 9*(1&2), 430 – 433. Retrieved from https://www.ijcsi/papers/IJCSI-9-1-2-430-433.pdf.org

Dhar, V., & Sundararajan, A. (2007). Information technologies in business: A blueprint for education and research. *Information Systems Research*, *18*(2), 125–141. doi:10.1287/isre.1070.0126

Dhawan, S. M. (1999). Towards an Effective Solution for Resource Sharing. In J. L. Sardana (Ed.), *Libraries and Information Services in the Electronic Information Era* (pp. 214–219). Indian Library Association.

Dhiman, A. K., & Rani, Y. (2007). *Resource Sharing and Library & Information Networks*. New Delhi: Ess Ess Publications.

Dickson, A. and Holley, R. P. (2010). Social networking in academic libraries, the possibilities And the concerns. *School of Library and Information Science Faculty Research Publications,* Paper 33.

Dodda, R. T., Smith, C., & Moorsel, A. (2009). An Architecture for Cross-Cloud System Management. *2nd International Conference on Contemporary Computing*, 556-567

Dolch, C., & Zawacki-Richter, O. (2018). Are students getting used to learning technology? Changing media usage patterns of traditional and non-traditional students in higher education. *Research in Learning Technology*, *26*(0), 1–17. doi:10.25304/rlt.v26.2038

Domizi, D. P. (2013). Microblogging to foster connections and community in a weekly graduate seminar course. *TechTrends*, *57*(1), 43–51. doi:10.100711528-012-0630-0

Dongardive, P. (2013). Marketing library and information services. *International Journal of Science and Research*, *2*(11), 227–234. Retrieved from https://www.ijsr.net/archive/v2i11/MDIwMTM0NDg=.pdf

Dougherty, D. (2012). The maker movement. *Innovations: Technology, Governance, Globalization*, *7*(3), 11–14. doi:10.1162/INOV_a_00135

Dowling, B. (2017). Engaging patrons with library podcasts. *Public Libraries Magazine*. Retrieved 08/09/2018 from http://publiclibrariesonline.org/2017/10/engaging-patrons-with-library-podcasts/

Drake, M. A. (n.d.). The impact of electronic information on library and documentation center organization and services. *JornadesCatalanes de Documentació, 7*(99). Retrieved on 16thMay, 2018 from http://www.cobdc.org/jornades/7JCD/drake.pdf

Drinkwater, K. (2010). E-book readers: What are librarians to make of them? *Sconul Focus*, *49*, 4–9.

Drury, G. (2008). Opinion piece: Social media: Should marketers engage and how can it be done effectively. *Journal of Direct. Data and Digital Marketing Practice*, *9*(3), 274–277. doi:10.1057/palgrave.dddmp.4350096

Duggan, M., & Brenner, J. (2013). *The demographics of social media users, 2012* (Vol. 14). Washington, DC: Pew Research Center's Internet & American Life Project.

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

Duke, V. J., Anstey, A., Carter, S., Gosse, N., Hutchens, K. M., & Marsh, J. A. (2017). Social media in nurse education: Utilization and E-professionalism. *Nurse Education Today*, *57*, 8–13. doi:10.1016/j.nedt.2017.06.009 PMID:28683342

Dushu, T. Y. (2016). Effects of weeding strategies on information resource management among public libraries in north-central states of Nigeria. *Library Philosophy and Practice (e-journal)*, 1433. Retrieved from http://digitalcommons.unl.edu/libphilprac/1433

Eaton, B. D., Elaluf-Calderwood, S., Sørensen, C., & Yoo, Y. (2015). Distributed Tuning of Boundary Resources: The Case of Apple's iOS Service System. *MIS Quarterly: Special Issue on Service Innovation in a Digital Age*, *39*(1), 217–243. doi:10.25300/MISQ/2015/39.1.10

Edem, M. (2010). Key issues in Nigerian university Libraries consortia building and sustainability. *Library and Information Practitioner*, *3*(1), 167–174.

Edem, N. (2008). The Digital Age: Changes and Challenges to Librarians in Nigerian University Library. *Delta Library Journal*, *2*(1/2), 47–57.

Edewor, N., & Omosor, U. (2008). Consortium Development in Nigerian Libraries: opportunities and challenges in a global information system. *International Journal of Social and Policy Issues, 5*(2), 15-25.

Edewor, N., Okite-Amughoro, F., Osuchukwu, N. P., & Egreajena, D. E. (2016). Marketing library and information services in selected university libraries in Africa. *International Journal of Advanced Library and Information Science, 4*(1), 291-300. Retrieved on 01st January, 2018 from file:///C:/Users/215080593/Downloads/386-1171-2-PB.pdf

Edom, B. O. (2012). *Principles of the use of the library*. Owerri: Springfield Publishers Ltd.

Educause. (2013). *7 Things you should know about … Makerspaces*. Retrieved from http://net.educause.edu/ir/library/pdf/ELI7095.pdf

Edward, L., & Bhuva, N. (2014). *Signage by Design: A Design-Thinking Approach to Library User Experience.* Academic Press. doi:10.3998/weave.12535642.0001.501

Eick, C. J., & King, D. T. (2012). Non-science majors' perceptions on the use of YouTube video to support learning in an integrated science lecture. *Journal of College Science Teaching*, *42*(1), 26–30.

Eke, H. N., Omekwu, C. O. & Odoh, J. N. (2014). The use of social networking sites among the undergraduate students of University of Nigeria, Nsukka. *Library Philosophy and Practice*, 1195.

Eke, H., N., Omekwu, C., O., & Odoh, J., N., (2014). The use of social networking sites among the undergraduate students of University of Nigeria, Nsukka. *Library Philosophy and Practice,* 1195.

Elder, A. D. (2013). College students' cell phone use, beliefs, and effects on their learning. *College Student Journal*, *47*(4), 585–592.

El-Kalash, K. I., Mohammed, S. B., & Aniki, M. Y. (2016). Exploring Infopreneurship for Economic Growth andSustainability in a Developing Economy: The Nigeria Perspective. *Journal of Educational Policy and Entrepreneurial Research*, *7*(3), 240–249.

Ellen, R. T. (2010). *Open access: a new paradigm for libraries and a new role for librarians*. Retrieved from: http://www.kb.se/dokument/Aktuellt/utbildning/Ifla%20OA%202010/IFLA2010

Elogie, A.A., Ikenwe, I.J., & Idubor, I. (2015). Factors influencing the adoption of smartphones by undergraduate students at Ambrose Alli University, Ekpoma, Nigeria. *The Information Technologist: An International Journal of Information and Communication Technology, 12*(1).

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

Elsevier. (2019). *Policies and ethics*. Retrieved from http://www.bbc.co.uk/ethics/introduction/intro_1.shtml

Emezie, N. A., & Nwaohiri, N. M. (2013). 21st century librarians and effective information service delivery. *Information Impact: Journal of Information and Knowledge Management, 4*(1), 30-43. Retrieved on 25th April, 2018 from https://www.researchgate.net/publication/282979435_21st_century_librarianns

Emmett, A., Stratton, J., Peterson, A. T., Church-Duran, J., & Haricombe, L. J. (2011). Toward open access: It takes a "village". *Journal of Library Administration*, *51*(5-6), 557–579. doi:10.1080/01930826.2011.589345

Enefu, O. M., Gbaje, E. S., & Aduku, B. S. (2015). The Adoption of Cloud Computing Technology for Library Services in the National Open University of Nigeria Library. *Information Manager (The)*, *15*(1-2), 22–32.

Erkoç, M. F., & Kert, S. B. (2011, June). Cloud computing for distributed university campus: A prototype suggestion. *International Conference on Future of Education*.

Espadas, J., Molina, A., Jiménez, G., Molina, M., Ramírez, R., & Concha, D. (2013). A tenant- based resource allocation model for scaling Software-as-a-Service applications over cloud computing infrastructures. *Future Generation Computer Systems*, *29*(1), 273–286. doi:10.1016/j.future.2011.10.013

Esposito, J. (2015). *Libraries and Consortia in the Context of a Publisher's Strategy*. Retrieved https://scholarlykitchen.sspnet.org/2015/09/30/libraries-and-consortia-in-the-context-of-a-publishers-strategy/

Essel, D. D., & Wilson, O. A. (2017). Factors affecting university students' use of Moodle: An empirical study based on TAM. *International Journal of Information and Communication Technology Education*, *13*(1), 14–27. doi:10.4018/IJICTE.2017010102

Etim, F. (2006). Resource Sharing in the Digital Age: Prospects and Problems in African Universities. *Library Philosophy and Practice*, *9*(1), 1–15.

Etro, F. (2009). The economic impact of cloud computing on business creation, employment and output in Europe. An application of the endogenous market structures approach to a GPT innovation. *Review of Business and Economics*, *54*(2), 179–208. Available at http://econpapers.repec.org/RePEc:ete:revbec:20090204

Eynden, V. V. D. (2015). *Legal and ethical issues: open access to data in research with people as participants. Research data management and open data. 23rd July, Social Science Data Archives*. Faculty of Social Sciences, University of Ljubljana.

Fagbola, O. O. (2016). Information literacy skills: Developing competencies for NOUN library users. In N. Adetoro & C. Nkiko (Eds.), *Providing sustainable and equitable access to information: Perspectives from Nigeria.Festchrift in honour of Professor Morayo Ibironke Atinmo @ 70.* Tai Solarin University of Education Press.

Farkus, G. (2010). *Final report on Saugus Union School District's SWATTEC Program," Saugususd.org*. Irvine, CA: University of California.

Fawley, N. (2012). Appearances do matter! *College & Research Libraries News*, *73*(7), 414–415. doi:10.5860/crln.73.7.8797

Fewkes, A., & McCabe, M. (2012). Facebook: Learning Tool or Distraction? *Journal of Digital Learning in Teacher Education*, *28*(3). Retrieved on 24th of July, 2018 from http://eric.ed.gov/?id=EJ972449

Fitzgerald, B. (2011). Open source software adoption: Anatomy of success and failure. In S. Koch (Ed.), *Multi-disciplinaryadvancement in open source software and processes* (pp. 1–23). Hershey, PA: IGI Global. doi:10.4018/978-1-60960-513-1.ch001

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

Fleming, L. (2014). *If you let them build it, they will learn*. Retrieved from http://worlds-of-learning.com/2014/03/24/if-you-let-them-build-it-they-will-learn/

Foster, D. L. (2011). *High school students' perceptions of innovative instructional options at a California charter school: A multiple case study* (Doctoral dissertation). Capella University. (AAT3434731)

Foster, I., Zhao, Y., Raicu, I., & Lu, S. (2008). Cloud Computing and Grid Computing 360 Degree Compared. *Grid Computing Workshop (GCE'08)*, 1-10. 10.1109/GCE.2008.4738445

Foster, J. (2009). Understanding interaction in information seeking and use as a discourse: A dialogic approach. *The Journal of Documentation*, *65*(1), 83–105. doi:10.1108/00220410910926130

Friedman, T. L. (2005). *The World is Flat*. New York: Farrar, Straus and Giroux.

Froese, A. D., Carpenter, C. N., Inman, D. A., Schooley, J. R., Barnes, R. B., Brecht, P. W., & Chacon, J. D. (2012). Effects of classroom cell phone use on expected and actual learning. *College Student Journal*, *46*(2), 323–332.

Fryer, L. K., & Bovee, H. N. (2016). Supporting students' motivation for e-learning: Teachers matter on and offline. *The Internet and Higher Education*, *30*, 21–29. doi:10.1016/j.iheduc.2016.03.003

Fuentes, S. C. (n.d.). *Digital Library, An experience of access to Information*. Retrieved from http://creativecommons.org/licenses/by/3.0

Furht, B. (2010). Cloud computing fundamental. In B. Furht & A. Escalanle (Eds.), Handbook of cloud computing. Academic Press. doi:10.1007/978-1-4419-6524-0_1

Fuxin, A.Y. (n.d.). *Mobile Smart Phone Use in Higher Education*. Academic Press.

Gakibayo, A., Ikoja-Odongo, J. R., & Okello-Obura, C. (2013). Electronic information resources utilization by students in Mbarara University Library. *Library Philosophy and Practice (e-journal), 869*. Retrieved on 9th April, 2017 from http://digitalcommons.unl.edu/libphilprac/869

Ganapathi. (2012). *Entrepreneurial Opportunities for Library and Information Science Professionals.* Paper presented at MANLIBNET's International Conference on Creating Wisdom and Knowledge through Shared Learning: Role of Librarians and Information Managers, IIM, Indore. Available at http://ssrn.com/abstract=2468738

Gao, L., Luo, T., & Zhang, K. (2012). Tweeting for learning: A critical analysis of research on microblogging in education published in 2008-2011. *British Journal of Educational Technology*, *43*(5), 783–801. doi:10.1111/j.1467-8535.2012.01357.x

Gay, L. R., Mills, G. E., & Airasian, P. W. (2011). Educational research: competencies for analysis and applications. Boston, MA: Pearson/Prentice Hall.

Geach, N., & Haralambous, N. (2009). Regulating harassment: Is the law fit for the Social networking age. *Journal of Criminal Law*, *73*(3), 241–257. doi:10.1350/jcla.2009.73.3.571

Geczy, P., Izumi, N., & Hasida, K. (2012). Cloudsourcing: Managing Cloud Adoption. *Global Journal of Business Research*, *6*(2), 57-70.

Gee, J. P. (2005). Semiotic Social Spaces and Affinity Spaces: From The Age of Mythology to Today's Schools. In D. Barton & K. Tusting (Eds.), Beyond communities of practice: Language, power and social context (pp. 214–232). Academic Press. doi:10.1017/CBO9780511610554.012

Georgsdottir, A. S., Lubart, T. I., & Getz, I. (2003). The role of flexibility in innovation. In L. V. Shavinina (Ed.), *The international handbook on innovation* (pp. 80–190). Amsterdam: Elsevier Science. doi:10.1016/B978-008044198-6/50013-9

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

Gerber, R. (2016). *Definition of a library: General definition*. Retrieved from https://libguides.ala.org/library-definition

Ghazizadeh, S. (2012). *Acceptance theory on mobile services and applications*. Vaasan Ammattikorkeakoulu University of Applied Sciences.

Ghosh, S. (2012). *How Worthy is Cloud Computing for Libraries*. In 8th Convention PLANNER-2012, Sikkim University, Gangtok.

Gideon, C. (2008). Open Access Initiative and the DevelopingWorld. *African Journal of Library Archives and Information Science*, *18*(2), 31–40.

Giles, G., & Price, I. R. (2008). Adolescent computer use: Approach, avoidance, and parental control. *Australian Journal of Psychology*, *60*(2), 63–71. doi:10.1080/00049530701829896

Ginaka, T., & Bob, C. (2007). *Analyzing Library Collection Use with Excel*. American Library Association.

Giuse, N. B. (1997). Advancing the practice of clinical medical librarianship. *Bulletin of the Medical Library Association*, *85*(4), 437. PMID:9431437

Goebel, R., Poole, D. L., & Mackworth, A. K. (1997). *Computational Intelligence: A Logical Approach*. Oxford, UK: Oxford University Press.

Goggin, G. (2006). *Cell phone culture: mobile technology in everyday life 251*. New York: Routledge.

Gokul, A. N., & Ambili, K. S. (2014). *Cloud computing and its application in libraries*. Retrieved from www.liscom.org/.../pdf/.../5%2015%20cloud%20computing%20and%20its%20application

Goldner, M. (2011). *Winds of change: Libraries and cloud computing*. Retrieved from https://www.oclc.org/content/damoclc/events/2011/files/IFLA_winds_of_change_paper.pdf

Goleman, D. (1998). What makes a leader? *Harvard Business Review*, *23*(1), 82–91. PMID:10187249

Gong, C., Liu, J., Zhang, Q., Chen, H., & Gong, Z. (2010). The characteristics of cloud computing. *39th International Conference on parallel processing workshop*. Retrieved from http://www.postdm.post.ir/_ITCenter/Documents/TheCharacteristicsofCloudComputing_20140722_154207.pdf

Gosavi, N., Shinde, S. S., & Dhakulkar, B. (2012). Use of Cloud Computing in Library and Information Science Field. *International Journal of Digital Library Services*, *2*(3).

Gottfredson, L. S. (1994). Mainstream Science on Intelligence. *Intelligence*, *24*(1), 13–23. doi:10.1016/S0160-2896(97)90011-8

Grajales, F. J. III, Sheps, S., Ho, K., Novak-Lauscher, H., & Eysenbach, G. (2014). Social Media: A of Applications in Medicine and Health Care. *Journal of Medical Internet Research*, *16*(2). PMID:24518354

Grant, C. (2012). The future of library system: Library services platform. *Information Standards Quality*, *4*(24), 1–13.

Greenfield, P., & Subrahmanyam, K. (2008). Online communication and adolescent relationships. *The Future of Children*, *18*(1), 119–140. doi:10.1353/foc.0.0006 PMID:21338008

Greengard, S. (2010). Cloud computing and developing nations. *Communications of the ACM*, *53*(5), 18–20. doi:10.1145/1735223.1735232

Greenleaf, R. K. (1977). Essentials of servant-leadership. In *Focus on leadership: Servant-leadership for the 21st Century* (pp. 19–25). New York: John Wiley & Sons.

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

Greenwalt, R. T. (2013). Embracing the Long Game. *Public Libraries*, *51*, 15–16.

Griffey, J. (2010). Electronic Book Readers. Gadgets and Gizmos: Personal Electronics and the Library. *Library Technology Reports*, *46*(3), 21–30.

Griffey, J. (2010). Gadgets and Gizmos: Personal Electronics and the Library. *Library Technology Reports*, *46*(3), 5–8.

Gross, E. (2004). Adolescent Internet use: What we expect, what teens report. *Journal of Applied Developmental Psychology*, *25*(6), 633–649. doi:10.1016/j.appdev.2004.09.005

Grossman, R. L., & Gu, Y. (2009). On the varieties of clouds for data intensive computing. *IEEE Computer Society. A Quarterly Bulletin of the Computer Society of the IEEE Technical Committee on Data Engineering*, *32*(1), 44–51.

Grossman, R. L., Gu, Y. H., Sabala, M., & Zhang, W. Z. (2009). Compute and storage clouds using wide area high-performance networks. *Future Generation Computer Systems-the International Journal of Grid Computing Theory Methods and Applications*, *25*(2), 179–183. doi:10.1016/j.future.2008.07.009

GSMA. (2014). *Digital inclusion*. Retrieved from: https://www.gsma.com/mobilefordevelopment/wp-content/uploads/2014/11/GSMA_Digital-Inclusion-Report_Web_Singles_2.pdf

Gu, B., & Ye, Q. (2014). First step in social media: Measuring the influence of online management responses on customer satisfaction. *Production and Operations Management*, *23*(4), 570–582. doi:10.1111/poms.12043

Gupta, D. K., & Savard, R. (2010). *Marketing library and information services*. Taylor & Francis. Retrieved on 01st January, 2018 from http://www.mapageweb.umontreal.ca/savardr/pdf/Gupta_Savard_ELISbis.pdf

Guskin, A. E. (1996). Facing the future. *Change*, *28*(4), 26–38. doi:10.1080/00091383.1996.9937759

Haber, S. (2011). *The Changing Role of Libraries in the Digital Age*. Retrieved from www.huffingpost.com/steve-haber

Hahn, J., & Zitron, L. (2011). How first-year students navigate the stacks: Implications for improving wayfinding. *Reference and User Services Quarterly*, *51*(1), 28–35. doi:10.5860/rusq.51n1.28

Hailey, J. H., & Arscott, J. (2013). Using technology to effectively engage adolescents and young adults into care: STAR TRACK Adherence Program. *The Journal of the Association of Nurses in AIDS Care*, *24*(6), 582–586. doi:10.1016/j.jana.2013.03.001 PMID:23809658

Hakoama, M., & Hakoyama, S. (2011). The Impact of Cell Phone Use on Social Networking and Development Among College Students. *American Association of Behavioral and Social Sciences Journal*, *15*, 1–20.

Handa, T. S. (2015). *Role of Public Library in the Society and a future vision of ICT enabled rendering of its services with special context to India*. Academic Press.

Hansen, D. L., Shneiderman, B., & Smith, M. A. (2010). *Analyzing social media networks with NodeXL: Insights from a connected world*. Morgan Kaufmann.

Hanson, T. L., Drumheller, K., Mallard, J., McKee, C., & Schlegel, P. (2011). Cell phones, text messaging, and Facebook: Competing time demands of today's college students. *College Teaching*, *59*(1), 23–30. doi:10.1080/87567555.2010.489078

Harnad, S. (2010). *Open access archivangelism*. Available: http://openaccess.eprints.org/

Harris, T. (n.d.). *Cloud computing: An overview*. Retrieved from https://www.thbs.com/downloads/cloud-computing-overview.pdf

Harvard University. (2018). *Open access policy*. Retrieved from https://osc.hul.harvard.edu/policies/

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

Hatch, M. (2013). *The maker movement manifesto*. New York: McGraw-Hill.

Hayes, B. (2008). Cloud computing. *Communication of the ACM, 15*, 9-11. Retrieved 22nd April, 2018 from: http://csrc.nistgov/organisations/fisseg/2009-conference/prelentational/fissea09-day3-cloudcomputing.pdf

Head, A. J. (2016). *Planning and designing academic library learning spaces: Expert perspectives of architects, librarians, and library consultants*. Retrieved on 2nd April, 2018 from http://www.projectinfolit.org/uploads/2/7/5/4/27541717/pil_libspace_report_12_6_16

Heaton-Shrestha, C., Gipps, C., Edirisingha, P., & Linsey, T. (2007). Learning and e-learning in HE: The relationship between student learning style and VLE use. *Research Papers in Education*, *22*(4), 443–464. doi:10.1080/02671520701651797

Henderson, A., & Bowley, R. (2010). Authentic dialogue? The role of "friendship" in a social media recruitment campaign. *Journal of Communication Management*, *14*(3), 237–257. doi:10.1108/13632541011064517

Hepburn, G., & Buley, J. (2006). Getting open source software into schools: Strategies and challenges. *Innovate (North Miami Beach, Fla.)*, *3*(1). Retrieved from http://www.innovateonline.info/ index.php?view=article&id=323

Hickey, M., & Rahmouni, M. (2010). Modelling Cloud Computing Infrastructure. Lecture Notes in Computer Science, *6155*, 106-109.

Hill, M. R. (1993). *Archival strategies and techniques*. Newbury Park, CA: Sage Publications. doi:10.4135/9781412983471

Hingorani, K.K., Woodard, D., & Danesh, N.A. (2012). Exploring how smartphones supports students' lives. *Issues in Information System, 13*(2), 33-40.

Hirata, H., Imai, K., Noguchi, M., & Asano, T. (2008). Acceleration of unified communications with NGN and SaaS. *NEC Technical Journal, 3*(3), 59-64. Retrieved from https://www.bigcommerce.com.au/ecommerce-answers/what-is-cloud-computing/

Hossain, M., Jahan, N., Fang, Y., Hoque, S., & Hossain, M. (2019). Nexus of electronic word-of-mouth to social networking sites: A sustainable chatter of new digital social media. *Sustainability*, *11*(3), 759. doi:10.3390u11030759

Huang, X. (2014, May). Research on university library digital resources integration under the cloud computing. *2nd International Conference on Teaching and Computational Science. Shenzhen, China. DOI*, 10. 10.2991/ictcs-14.2014.22

Hurwitz, J., Kaufman, M., & Halper, F. (2012). *Cloud services for dummies. IBM Limited Edition*. Hoboken, NJ: John Wiley & Sons, Inc.

Hussain, A., & Lavanya, N. (2014). *The impact of ICTs in library and information services at Indus Business Academy, Bangalore*. Retrieved on 2nd May, 2018 from https://www.researchgate.net/publication/270279059_The_impact_of_ICTs_in_library

Hussain, A., Khan, M. A., & Zaidi, N. F. (2013). The ICT based library and Information services: A case study of B-Schools in Delhi and NCR region. *Library Philosophy and Practice*. Retrieved on 2nd May, 2018 from https://digitalcommons.unl.edu/cgi/viewcontent.cgi?referer=https://www.google.com

Hussain, A., & Kumar, K. (2013). Utilization of information resources and services of the master school of management library: A study. *International Journal of Library Science*, *9*(3), 39–52. Retrieved from https://www.researchgate.net/profile/Akhtar_Hussain4/publication/236861848

Hussain, A., & Nisha, F. (2017). Awareness and Use of Library Makerspaces among Library Professionals in India: A Study. *DESIDOC Journal of Library and Information Technology*, *37*(2), 84–90. doi:10.14429/djlit.37.2.10989

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

Hussain, I. (2012). A study to evaluate the social media trends among university students. *Procedia: Social and Behavioral Sciences*, *64*, 639–645. doi:10.1016/j.sbspro.2012.11.075

Hussaini, S., Vashistha, R., Garba, A., & Jimah, H. (2017). Cloud computing in Nigerian university library system: An overview. *International Journal of Advance Research in Science and Engineering.*, *6*(8), 684–690.

Huth, A., & Cebula, J. (2011). *The basics of cloud computing*. Carnegie Mellon University. US-CERT. Retrieved from https://www.us-cert.gov/sites/defaults/files/publications/cloud/computingHuthCebula.pdf

Hu, Y., Farnham, S. D., & Monroy-Hernández, A. (2013, April). Whoo. ly: facilitating information seeking for hyperlocal communities using social media. In *Proceedings of the SIGCHI Conference on Human Factors in Computing Systems* (pp. 3481-3490). ACM. 10.1145/2470654.2466478

Ibegwam, A. (2014). Entrepreneurship Constraints and the Way Forward: A Case for Prospective Entrepreneurs in the Library and Information Profession. In Entrepreneurship Studies and Practices in Library and Information Science. Lagos: Zeh Communications.

Idubor, I. (2015). Investigating social media usage and addiction levels among undergraduates in University of Ibadan, Nigeria. *British Journal of Education, Society &. Behavioral Science*, *7*(4), 291–301.

Igafo-Te'o, J. D. (2002). Development experts say children suffer due to lack of unstructured fun. *Bridges4Kids.* Retrieved from http://www.bridges4kids.org/articles/2002/10-02/Post10-1-02.html

Igbokwe, J. C., Ezeji, E. C., & Obidike, N. A. (2010). Problems militating against marketing of library services in selected Nigerian libraries. *Journal of Applied Information Science and Technology, 4*. Retrieved on 31st December, 2017 from https://www.researchgate.net/publication/268504867_Problems_Militating_against

Igu, A., & Ojiegbe, G. O. (2017). Consortium Development and Resource Sharing, the WRLC Model: Creating Synergies for Success for Nigerian Libraries. *Journal of Applied Information Science and Technology*, *10*(3), 95–99.

Ikenwe, I.J., Idhalama, O.U., & Inegbenojie, O.E. (2017). Empirical Look at the Use and Impact of Smart Phones by Medical Students for Laboratory/Educational Purposes at Ambrose Alli University, Ekpoma, Edo State. *Greener Journal of Educational Research*, *7*(4), 61-69.

International Telecommunications Union. (2012). *Cloud computing in Africa: Situation and perspectives. Telecommunications Development Sector*. Retrieved12th April, 2018 from http://www.itu.int/ITU-D/treg/publications/Cloud_Computing_Afrique-e.pdf

Iowa State Library. (2017). *The Present and Future of Open Access*. Retrieved from https://www.lib.iastate.edu/news/present-and-future-open-access

Isbell, R., Sobol, J., Lindauer, L., & Lowrance, A. (2004). The effects of storytelling and story reading on the oral language complexity and story comprehension of young children. *Early Childhood Education Journal*, *32*(3), 157–163. doi:10.1023/B:ECEJ.0000048967.94189.a3

Islam, M. M. (2012). *Present Status of Library Cooperation, Networking, and Resource Sharing in Bangladesh: Web-based Library Cooperation for Access to World-wide Information Mirza*. Library Philosophy and Practice.

Islam, M. S., & Islam, M. N. (2009). Marketing of library and information products and services: A theoretical analysis. *Business Information Review*, *26*(2), 123–132. doi:10.1177/0266382109104414

Issa, A. O. (2009). *Fundamentals of library and information science*. Retrieved on 27th April, 2018 from http://elibrary.bsu.az/books_rax/N_24.pdf

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

Itodo, D. S. (2012). Nigeria: Youths and Social Networking Obsession. Retrieved from AllAfrica.com/stories/20110140376.html

Iwhiwhu, B. E., Ruteyan, J. O., & Eghwubare, A. (2010). Mobile Phones for Library Services: Prospects for Delta State University Library, Abraka. *Library Philosophy and Practice*, *346*. Retrieved from http://digitalcommons.unl.edu/libphilprac/346

J.K. & I. (2015). Mobile devices for academic practices by students of college of sciences in selected Nigerian private universities. *The Electronic Library*, *33*(4), 749-759.

Jabareen, Y. (2009). Building a conceptual framework: Philosophy, definitions, and procedure. *International Journal of Qualitative Methods*, *8*(4), 49–62. doi:10.1177/160940690900800406

Jadeja, Y., & Modi, K. (2012). Cloud computing: Concepts, architecture and challenges. *Intenational Conference on Computing, Electronics and Electrical Technologies,* 877 – 880.

Jain, P. (2012). Promoting Open Access to Research in Academic Libraries. *Library Philosophy and Practice, 737*. Retrieved from http://digitalcommons.unl.edu/libphilprac/737

James, I. J. (2011). *Problems of the Book Publishing Industry in Nigeria: The Onibonje Publishers Experience after 50 Years*. Academic Press.

James. (2005). *The Wisdom of Crowds*. Anchor Books.

Jani, K., Kumar, B., & Shah, H. (2013). Degree of Multi-tenancy and its Database for Cloud Computing. *International Journal of Engineering Development and Research,* 168-171. Retrieved 21st August, 2018 from https://www.ijedr.org/papers/IJEDR1303035.p df

Jankowska, M. A., Hertel, K., & Young, N. J. (2006). Improving library service quality to graduate students: Libqual+ TM survey results in a practical setting. *Portal: Libraries and the Academy, 6*(1), 59-76. Retrieved on 15thMay, 2018 from http://www.libqual.org/documents/admin/Jankowska_Hertel_Young.pdf

Jason, R. (2006). *Types of social networking sites*. Academic Press.

Jeljali, R., Al Naji, L., & Khazam, K. (2018). A comparison between Moodle, Facebook, and paper-based assessment tools: Students' perception of preference and effect on performance. *International Journal of Emerging Technologies in Learning*, *13*(5), 86–99. doi:10.3991/ijet.v13i05.8091

Jensen, R. B. (2010). Optimizing library content for mobile phones. *Library Hi Tech News*, *27*(2), 6–9. doi:10.1108/07419051011050411

Jeong, T.G. (2005). The effect of internet addiction and self-control on achievement of elementary school children. *Korean Journal of Yeolin Education*, *5*(3).

Jiang, L. C., Bazarova, N. N., & Hancock, J. T. (2011). The disclosure-intimacy link in computer-mediated communication: An attributional extension of the hyperpersonal model. *Human Communication Research*, *37*(1), 58–77. doi:10.1111/j.1468-2958.2010.01393.x

JISC TechDis. (2010b). *Towards Accessible e-Book Platforms (Report March 2010).* Retrieved from http://www.jisctechdis.ac.uk/techdis/resources/detail/goingdigital/

Johnson, C., & Kritsons, W. A. (2007). National School Debate: Banning Cell phones On Public School Campuses in America. *National Forum of Education Administration and Supervision Journal, 25*(4), 1-6.

Johnson, H. A. (2017). Trello. *Journal of the Medical Library Association: JMLA*, *105*(2), 209. doi:10.5195/jmla.2017.49

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

Jonah, A. (2013). *Social networking: the new Nigeria.* The Bug, p. 2.

Juan-Quilis, V., & Muñoz-Gonzalez L. (n.d.). *New Challenges, New Skills for a Digital Library; Andalusian eHealth Library*. Consejeria de Igualdad, Saludy Politicas Sociales, Seville, Spain.

Jubb, M., & Green, R. (2007). *Researchers' use of academic libraries and their services*. Retrieved May 31, 2010 from http://www.rin.ac.uk/system/files/.../Researchers-libraries-services-report.pdf

Jubien, P. (2013). Shape Shifting Smart Phones: Riding the Waves in Education. *Canadian Journal of Learning and Technology*, 39.

Junco, R., Heiberger, G., & Loken, E. (2011). The effect of Twitter on college student engagement and grades. *Journal of Computer Assisted Learning*, *27*(2), 119–132. doi:10.1111/j.1365-2729.2010.00387.x

Kaba, A. (2011). Marketing information resources and services on the web: Current status of academic libraries in the United Arab Emirates. *Information Development*, *27*(1), 58–65. doi:10.1177/0266666910394625

Kaefer, G. (2010). *Cloud computing architecture*. Retrieved from https://resources.sei.cmu.edu/asset_files/presentation/2010_017_001_23337.pdf

Kairam, S., Brzozowski, M., Huffaker, D., & Chi, E. (2012). Talking in circles: selective sharing in google+. *Proceedings of the 2012 ACM annual conference on Human Factors in Computing Systems*, 1065-1074.

Kami Huyse, A. P. R. (2013). *Social Media Measurement: A Step-by-Step Approach*. Academic Press.

Kamila, K. (2013). *Role of cloud computing in modern libraries: A critical appraisal*. Retrieved from http://www.techsoupforlibraries.org/blog/what-is-cloud-computing-and-how-will-it-affect-libraries

Kanelechi,, C.K., Nwangwa, E.Y., & Omotere, T. (2014). Undergraduates and Their Use of Social Media: Assessing Influence on Research Skills. *Universal Journal of Educational Research*, *2*(6), 446–453.

Kantrowitz, M. (2012). *Tuition Inflation*. Available at http://www.finaid.org/calculators/tuition model

Kaplan, A. M., & Haenlein, M. (2010). Users of the world, unite! The challenges and opportunities of Social Media. *Business Horizons*, *53*(1), 59–68. doi:10.1016/j.bushor.2009.09.003

Kasperek, S. (2014, Spring). Sign Redesign: Applying Design Principles to Improve Signage in an Academic Library. *College and Research Division*, *2*(1), 48. doi:10.5195/palrap.2014.54

Kaur, A., & Rani, S. (2008). Marketing of information services and products in university libraries of Punjab and Chandigarh (India): An attitudinal assessment of library professionals. *Library Management*, *29*(6/7), 515–537. doi:10.1108/01435120810894536

Kaushik, A., & Kumar, A. (2013). Application of cloud computing in libraries. *International Journal of Information Dissemination and Technology*, *3*(4), 270–273.

Keen, A. (2007). *The cult of the amateur: How the democratization of the digital world is assaulting our economy, our culture, and our values*. New York: Doubleday Currency.

Kelly, B. (2008). *Library 2.0: Opportunities and Challenges*. Paper presented at the NDAP International Conference, Taipei, Taiwan. Retrieved July 12, 2018 from http://www.ukoln.ac.uk/web-focus/events/conferences/ndap-2008/

Kenneway, M. (2007). Marketing the library: Using technology to increase visibility, impact and reader engagement. *Serials, 20*(2). Retrieved on 16thMay, 2018 from file:///C:/Users/Rhodes%20Mwageni/Downloads/1196-1567-1-SM.pdf

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

Khan, S. A., & Bhatti, R. (2012). Application of social media in marketing of library and information services: A case study from Pakistan. *Webology, 9*(1), 1-8. Retrieved on 01st January, 2018 from http://www.webcitation.org/6fLKoMowZ

Khan, S. A., & Bhatti, R. (2012). Application of social media in marketing of library and Information services: A case study from Pakistan. *Webology*, *9*(1), Article 93. Retrieved from http://www.webology.org/2012/v9n1/a93.html

Khan, S.A., & Bhatti, R. (2012). Application of Social Media in marketing library and information services: A case study from Pakistan. *Webology, 9*(1).

Khan, J. (2016). Impact of information communication technology on library and its services. *International Journal of Research-Granthaalayah*, *4*(9), 97–100. Retrieved from http://granthaalayah.com/Articles/Vol4Iss9/11_IJRG16_C09_114.pdf

Kiesling, L. L. (2016). Implications of Smart Grid Innovation for Organizational Models in Electricity Distribution. In C.-C. Liu (Ed.), *Wiley Handbook of Smart Grid Development*. Hoboken, NJ: Wiley. doi:10.1002/9781118755471.sgd043

Kietzmann, J. H., Silvestre, B. S., McCarthy, I. P., & Pitt, L. F. (2012). Unpacking the social media phenomenon: Towards a research agenda. *Journal of Public Affairs*, *12*(2), 109–119. doi:10.1002/pa.1412

Kietzmannn, J., Silverstre, B., Mccarthy, I., & Leyland. (2012). Unpacking the social media phenomenon: towards a research agenda. *Journal of Public Affairs, 12*(2), 109-119.

Kim, Y., & Abbas, J. (2010). Adoption of Library 2.0 functionalities by academic libraries and Users. a knowledge management perspective. *Journal of Academic Librarianship*, *36*(3), 211–218. doi:10.1016/j.acalib.2010.03.003

Kinney, B. (2010). The Internet, Public Libraries, and the Digital Divide. *Public Library Quarterly*, *29*(2), 104–161. doi:10.1080/01616841003779718

Kiryakova, G., Angelova, N., & Yordanova, L. (2015). Application of cloud computing services in business. *Trakia Journal of Sciences*, *13*(1), 392-396. Retrieved from tru.uni-sz.bg/tsj/vol.13.2015,sup.1,seriessocialscience/sf/sf/info.tech/G.kiryakova.pdf http://www.uni-sz.bg

Klein, C., & Kaefer, G. (2008). From smart homes to smart cities: Opportunities and challenges from an industrial perspective, Next Generation TeletraffÕc and Wired/Wireless Advanced Networking, Proceedings. *Lecture Notes in Computer Science*, *5174*, 260. doi:10.1007/978-3-540-85500-2_24

Koh, K. C., Wan, J. K., Selvanathan, S., Vivekananda, C., Lee, G. Y., & Ng, C. T. (2014). Medical Student Perceptions Regarding the Impact of Mobile Medical applications on Their Clinical Practice. *Journal of Mobile Technology in Medicine*, *3*(1), 46–53. doi:10.7309/jmtm.3.1.7

Ko, N. Y., Hsieh, C. H., Wang, M. C., Lee, C., Chen, C. L., Chung, A. C., & Hsu, S. T. (2013). Effects of Internet popular opinion leaders (iPOL) among Internet-using men who have sex with men. *Journal of Medical Internet Research*, *15*(2), e40. doi:10.2196/jmir.2264 PMID:23439583

Kosturski, K., & Skornia, F. (2011). Handheld libraries using mobile technologies inthe academic library. *Feature*, *31*(6), 19–26.

Kotler, P., Keller, K. L., Koshy, A., & Jha, M. (2007). *Marketing Management: A South Asian Perspective* (12th ed.). New Delhi: Prentice Hall.

Kridel, C. (2018). An introduction to documentary research. *American Education Research Association*. Retrieved 06/12/2018 from http://www.aera.net/SIG013/Research-Connections/Introduction-to-Documentary-Research

Kroski, E. (2008). On the move with the mobile web: Libraries and mobile technologies. Library Technology Reports, 1-48.

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

Krubu, D., & Osawaru, K. (2010). *The impact of information and communication technology (ICT) in Nigerian university libraries*. Retrieved on 6th April, 2018 from https://digitalcommons.unl.edu/cgi/viewcontent.cgi?referer=https://www.google.com/&httpsredir

Kubiatowicz, J., Bindel, D., Chen, Y., Czerwinski, S., Eaton, P., Geels, D., ... Wells, C. (2000, November). Oceanstore: An architecture for global-scale persistent storage. *ACM SIGARCH Computer Architecture News*, *28*(5), 190–201. doi:10.1145/378995.379239

Kumar, A. (2014). Marketing of information products & services in Kurukshetra University Library in the disciplines of social science: A study. *IOSR Journal of Humanities and Social Science (IOSR-JHSS), 19*, 72-85. Retrieved on 30th December, 2017 from https://s3.amazonaws.com/academia.edu.documents/34090632/L019217285.pdf

Kumar, L. S., Jamatia, B., Aggarwal, A.K., & Kannan, S. (2011). Mobile device intervention for student support services in distance education context–FRAME model perspective. *European J Open, Distance E-learning, 14*(2). Retrieved from http://www.eurodl.org/index.php?p=current&article=447

Kumar, P. S. G. (2004). *Information Technology: Applications*. New Delhi: BRPC.

Kumar, V., & Sharma, D. (2016). Creating collaborative and convenient learning environment using cloud-based Moodle LMS: An instructor and administrator perspective. *International Journal of Web-Based Learning and Teaching Technologies*, *11*(1), 35–51. doi:10.4018/IJWLTT.2016010103

Kumbhar, S., & Pawar, R. (2014). Mobile based services: application and challenges. In *Proceed. Changing Trends Acad. Lib. Librarianship Digital Env.* Shivaji University.

Kumbhar, S., & Pawar, R. (2014). *Mobile based services: Application and challenges*. doi:10.1314/2.1.2373.2000

Kundra, V. (2010). State of public sector cloud computing. Washington, DC: Academic Press.

Kuppuswamy, S., & Narayan, P. (2010). The Impact of Social Networking Websites on the Education of Youth. *International Journal of Virtual Communities and Social Networking*, *2*(1), 67–79. doi:10.4018/jvcsn.2010010105

Kuratko, D. F. (2005). The Emergence of Entrepreneurship Education: Development, Trends, and Challenges. *European Journal of Business and Management*, *6*(6), 38–42.

Kuss D. J., & Griffiths M. D. (2011). Online Social Networking and Addiction-A Review of the Psychological Literature. *Int. J. Environ. Res. Public Health*, *8*, 3528-3552. . doi:10.3390/ijerph8093528

Kwanya, T. J. M. (2011). *The Potential of Library 2.0 for Research Libraries in Kenya* (Unpublished Ph.D Thesis). School of Sociology and Social Studies, Faculty of Humanities, Development and Social Sciences, University of KwaZulu-Natal, Pietermaritzburg

Lafeber, M. M., & Saunders, L. D. (2008). *Copyright protection in the digital age: Google book settlement and beyond.* Retrieved on 4th April, 2018 from https://apps.americanbar.org/litigation/committees/intellectual/roundtables/1108

Lambert, K. M., Barry, P., & Stokes, G. (2012). Risk management and legal issues with the use of social media in the healthcare setting. *Journal of Healthcare Risk Management*, *31*(4), 41–47. doi:10.1002/jhrm.20103 PMID:22528403

Lara, K. (2014). *Open Access Library Survey. An investigation of the role of libraries in open access funding and support within institutions*. Academic Press.

Lederer, K. (2012). Pros and cons of social media in the classroom. *Campus Technology*, *25*(5), 1–2.

Lee, K., Oh, W. Y., & Kim, N. (2013). Social media for socially responsible firms: Analysis of Fortune 500's Twitter profiles and their CSR/CSIR ratings. *Journal of Business Ethics*, *118*(4), 791–806. doi:10.100710551-013-1961-2

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

Lenhart, A., Purcell, K., Smith, A., & Zickuhr, K. (2010). *Social Media & Mobile Internet Use among Teens and Young Adults. Millennials.* Pew internet & American life project.

Lenhart, A., Purcell, K., Smith, A., & Zickuhr, K. (2011). *Social Media & Mobile Internet Use among Teens and Young Adults.* Washington, DC: Pew Internet & American Life Project. Retrieved from: http://www.sde.idaho.gov/site/idahoStatePreventionConf/IPC%202011%20Presentations/Using%20Social%20Me dia/PIP

León, A., Cáceres, C., Fernández, E., Chausa, P., Martin, M., Codina, C., ... Blanco, J. L. (2011). A new multidisciplinary home care telemedicine system to monitor stable chronic human immunodeficiency virus-infected patients: A randomized study. *PLoS One*, *6*(1), e14515. doi:10.1371/journal.pone.0014515 PMID:21283736

Levine-Clarke, M. (2014). Access to Everything: Building the Future Academic Library Collection. *portal. Libraries and the Academy*, *14*(3), 425–443. doi:10.1353/pla.2014.0015

Lewis, D. (2016). *This Robot Librarian Locates Haphazardly Placed Books: It's the Next Best Thing since the Dewey Decimal System*. Accessed on July 24, 2018 at https://www.smithsonianmag.com/smart-news/robot-librarian-locates-haphazardly-placed-books-180959381/#gXxorjSCWdLgxZiG.99

Lewis, G. (2010). *Basics about cloud computing*. Retrieved from https://resources.sei.cmu.edu/asset/files/whitepaper/2010_019_001_28877.pdf

Lewis, D. W. (2016). *Reimagining the Academic Library*. Lanham, MD: Rowman & Littlefield.

Liang, X., Ward, C., & Xiao, Y. C. (2008). Enhancing technology use through open source software: Initial findings. *Proceedings of World Conference on E-Learning in Corporate Government Healthcare and Higher Education 2008*. Retrieved from http://www.editlib.org/d/29741/proceeding_29741.pdf

Liebowitz, J. (2003). Relations between Data, Information, Knowledge and Wisdom. In *Basic Knowledge Concepts - Data, Information, Knowledge and Wisdom*. Trainmore Know-How Handbook and Portal. Available at: http://www.trainmorknowmore.eu/FBC5DDB3.en.aspx

Lijun, M., Chan, W. K., & Tse, T. H. (2008). A tale of clouds: Paradigm comparisons and some thoughts on research issues. *IEEE Asia-Pacific Services Computing Conference, APSCC'08*, 464-469.

Li, L. L.LiLi. (2006). Leveraging quality web-based library user services in the digital age. *Library Management*, *27*(6/7), 390–400. doi:10.1108/01435120610702387

Li, N., & Kirkup, G. (2007). Gender and cultural differences in Internet use: A study of China and the UK. *Computers & Education*, *48*(2), 301–317. doi:10.1016/j.compedu.2005.01.007

Lin, A., & Chen, N. C. (2012). Cloud computing as an innovation: Perception, attitude, and adoption. *International Journal of Information Management*, (51), 176–189.

Lin, G., & Subrahmanyam, K. (2007). Adolescents and the net: Internet use and wellbeing. *Adolescence*, *42*(168), 659–675. Retrieved from http://findarticles.com/ p/articles/ mi_m2248/ is_168_42 /ai_n27483301/ PMID:18229503

Lippincott, J. K. (2010). A mobile future for academic libraries. *RSR. Reference Services Review*, *38*(2), 205–213. doi:10.1108/00907321011044981

Litchfield, S. (2010). Defining the Smart phone. Retrieved from http://www.allaboutsymbian.com/feature/item/defining-he-smartphonephp

Little, G. (2011). Keeping moving: Smart phone and mobile technologies in the academic library. *Journal of Academic Librarianship*, *37*(3), 267–269. doi:10.1016/j.acalib.2011.03.004

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

Littlejohn, S. W., & Foss, K. A. (2009). *Encyclopedia of Communication Theory*. SAGE Publications, Inc. doi:10.4135/9781412959384

Liu, Y. (2010). Social media tools as a learning resource. *Journal of Educational Technology Development and Exchange*, *3*(1), 101–114. doi:10.18785/jetde.0301.08

Liu, Y., & And Briggs, S. (2012). A library in the palm of your hand: Mobile services in top 100 university libraries. *Information Technology and Libraries*, 133–148.

Livingstone, S. (2008). Taking risky opportunities in youthful content creation: Teenagers' use of social networking sites for intimacy, privacy and self-expression. *New Media & Society*, *10*(3), 393–411. doi:10.1177/1461444808089415

Li, Y., Tan, C.-H., Xu, H., & Teo, H.-H. (2011). Open source software adoption motivations of adopters and amotivations of non-adopters. *ACM SIGMIS Database*, *42*(2), 76–94. doi:10.1145/1989098.1989103

Loertscher, D. V., Preddy, L., & Derry, B. (2013). Makerspaces in the school library, learning commons, and the uTEC maker model. *Teacher Librarian*, *41*(1), 48–51.

Lor, P. (2007). *Libraries in times of open access*. Paper presented at the APE 2007: Academic Publishing in Europe Conference "Innovation & Publishing." 10.3233/ISU-2007-27411

Lucarevschi, C. (2016). The role of storytelling in language learning: A literature review. *Working papers of linguistics circle of the university of Victoria, 26*, 24–44.

Lui, X., & LaRose, R. (2008). Does using the internet make people more satisfied with their lives? The effects of the internet on college students' school life satisfaction. *Cyberpsychology & Behavior*, *11*(3), 310–320. doi:10.1089/cpb.2007.0040 PMID:18537501

Madhusudhan, M. (2008). Marketing of library and information services and products in university libraries: A case study of Goa University Library. *Library Philosophy and Practice (e-journal)*, *175*. Retrieved on 14th February, 2018 from http://digitalcommons.unl.edu/libphilprac/175

Magno, G., Comarela, G., Saez-Trumper, D., Cha, M., & Almeida, V. (2012, November). New kid on the block: Exploring the google+ social graph. In *Proceedings of the 2012 ACM conference on Internet measurement conference*(pp. 159-170). ACM. 10.1145/2398776.2398794

Maguth, B. M. (2013). The educative potential of cell phones in the social studies. classroom. *Social Studies*, *104*(2), 87–91. doi:10.1080/00377996.2012.655347

Mahajan, A. P., Sayles, J. N., Patel, V. A., Remien, R. H., Ortiz, D., Szekeres, G., & Coates, T. J. (2008). Stigma in the HIV/AIDS epidemic: A review of the literature and recommendations for the way forward. *AIDS (London, England)*, *22*(Suppl 2), S67. doi:10.1097/01.aids.0000327438.13291.62 PMID:18641472

Maharana, B., Biswal, S., & Sahu, N. K. (2009). Use of Information and Communication Technology by Medical Students: A Survey of VSS Medical College, Burla, India. *Library Philosophy and Practice, 281*. Retrieved from http://digitalcommons.unl.edu/libphilprac/281

Makinde, O. T., Aba, J. I., & Ugah, A. D. (2017) Accessibility and Utilization of Reference Resources by Fisheries Undergraduate Students in Universities in North- Central, Nigeria. *Journal of Applied Information Science and Technology, 10*(3), 61-71. Retrieved from https://www.jaistonline.org/

Malathy, S., & Kantha, P. (2013). Application of Mobile Technologies to Libraries. *DESIDOC Journal of Library and Information Technology*, *33*(5), 361–366. doi:10.14429/djlit.33.5098

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

Malinga, S. (2016). *African cloud adoption to grow at 42% a year*. Retrieved 12th August, 2018 from https://www.itweb.co.za/content/RWnpNgM2bV8MVrGd

Mancinelli, E. (2008). e-Inclusion in the Information Society. *Information Society. From theory to political practice. Coursebook*, 171-182.

Mannan, M., & Oorschot, P. C. (2004). A protocol for secure public instant messaging. *Proceedings of the 10th international conference on Financial Cryptography and Data Security.*

Mark, D. R. (2013). *Cloud computing security: the scientific challenge, and a survey of solutions*. Retrieved 24th October, 2018 from http://citeseerx.ist.psu.edu/viewdoc/download?doi=10. 1.1.675.6453&rep=rep1&type=pdf

Marsh, J., Kumpulainen, K., Nisha, B., Velicu, A., Blum-Ross, A., Hyatt, D., … Thorsteinsson, G. (2017). *Makerspaces in the Early Years: A Literature Review.* University of Sheffield: MakEY Project.

Marston, S., Li, Z., Bandyopadhyay, S., Zhang, J., & Ghalsasi, A. (2011). Cloud computing— The business perspective. *Decision Support Systems*, *51*(1), 176–189. doi:10.1016/j.dss.2010.12.006

Martha, K., & Shaneka, M. (Eds.). ARL Statistics 2008–2009. Washington, DC: Association of Research Libraries.

Martin, L. L. (2015). The promise of the maker movement for education. *Journal of Pre-College Engineering Education Research*, *5*(1), 30–39. doi:10.7771/2157-9288.1099

Matt, G. (2010). *Winds of change: Libraries and cloud computing*. OCLC Online Computer Library Center. Retrieved 23rd April, 2018 from:http://www.oclc.org/cont ent/dam/oclc/events/ 2011/files/IFLA-windsof-change-paper.pdf

Mayer, R. E., & Moreno, R. (2003). Nine Ways to Reduce Cognitive Load in Multimedia Learning. *Educational Psychologist*, *38*(1), 43–53. doi:10.1207/S15326985EP3801_6

Mayfield, A. (2008). *What is social media?* Academic Press.

Mazman, S. G., & Usluel, Y. K. (2010). Modeling educational usage of Facebook. *Computers & Education*, *55*(2), 444–453. doi:10.1016/j.compedu.2010.02.008

McCulloch, G. (2004). *Documentary research in education, history and the social sciences*. London: RoutledgeFalmer. doi:10.4324/9780203464588

McKechnie, L. E. F., & Pettigrew, K. E. (2002). Surveying the use of theory in library and information science research: A disciplinary perspective. *Library Trends*, *50*(3), 406–417.

McKenzie, P. J. (2010). Informing relationships: small talk, informing and relationship building in midwife-woman interaction. *Information Research*, *15*(1). Retrieved 07 October, 2018 from http://informationr.net/ir/15-1/paper423.html

Mell, P. (2009). *Effectively and securely using the Cloud Computing Paradigm*. Retrieved January 9th, 2015 from http://csrc.nist.gov/groups/SNS/cloud-computing/cloudcomputing-v26.ppt

Mell, P., & Grance, T. (2011). *The NIST Definition of Cloud Computing*. National Institute of Standards and Technology. Retrieved August 2018, from http://crsc.nist.gov/groups/SNS/ cloud-computing/cloud-def-v15.doc

Merten, M., & Williams, A. (2009). Adolescents' online social networking following the death of a peer. *Journal of Adolescent Research*, *24*(1), 67–90. doi:10.1177/0743558408328440

Mesch, G. (2009). Parental mediation, online activities, and cyberbullying. *Cyberpsychology & Behavior*, *12*(4), 387–392. doi:10.1089/cpb.2009.0068 PMID:19630583

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

Mi, M., Wu, W., Qiu, M., Zhang, Y., & Wu L, Li, J. (2016). Use of mobile devices to access resources among health professions students: A systematic review. *Medical Reference Services Quarterly*, *35*(1), 64-82.

Midha, V., & Palvia, P. (2012). Factors affecting the success of open source software. *Journal of Systems and Software*, *85*(4), 895–905. doi:10.1016/j.jss.2011.11.010

Mijwel, M. M. (2015). *History of Artificial Intelligence*. Available on http://www.researchgate.net/publication/322234922

Minocha, S. (2009). Role of social software tools in education: A literature review. *Education + Training*, *51*(5/6), 353–369. doi:10.1108/00400910910987174

Mishkoff, H. C. (1988). *Understanding Artificial Intelligence* (2nd ed.). Indianapolis, IN: Howard W. Sams& Company.

Mississippi Department of Education. (n.d.). *Creating a School Library Makerspsce: Guide and Resources*. Author.

Mitchell, E. (2011). *Library in the clouds: Cloud computing and its impact on library services*. Retrieved from https://aallspectrum.wordpress.com/2011/08/12/library-in-the-clouds-cloud-computing-and-its-impact-on-library-services/

Mitchell, E. (2010). What Cloud Computing Means for Librarie? In E. M. Corrado & H. L. Moulasion (Eds.), *Getting Started with Cloud Computing* (pp. 1–5). Facet.

Mitchell, E. T. (2010). Cloud computing and your library. *Journal of Web Librarianship*, *4*(1), 83–86. doi:10.1080/19322900903565259

Mitchell, P. (2008). Learning architecture: Issues in indexing Australian education in a Web 2.0 world. *The Indexer*, *26*(4), 163–169. doi:10.3828/indexer.2008.50

Mitra, M. (2016). Promoting library services in the digital era among the children and young adults. *The International Federation of Library Association and Institutions (IFLA).* Retrieved on 7th January, 2018 from https://www.ifla.org/node/10518

Mohseni, S. (2017). *Marketing plan for Kajaani University of Applied Sciences Library*. Retrieved on 16th May, 2018 from http://www.theseus.fi/bitstream/handle/10024/123133/Marketing+Plan+for+Kajaani

Molyneaux, H., O'Donnell, S., Gibson, K., & Singer, J. (2008). Exploring the gender divide on YouTube: An analysis of the creation and reception of vlogs. *American Communication Journal*, *10*(2), 1–14.

Monge, R. (2007, November). Designing YouTube instructional videos to enhance information literacy. In *Brick and Click Libraries: An Academic Library Symposium.* Northwest Missouri State University.

Moonis, S. M. (2016). Cloud computing for agent-based urban transportation system. *International Research Journal of Engineering and Technology*, *3*(3), 563–566.

Moore, G. (2010) *Atmosphere: Core, Content and the Cloud*. Youtube Video. Retrieved from: www.youtube.com/eventsatgoogle#p/u/8/0swJCYLH

Moorefield-Lang, H. M. (2015). User agreements and makerspaces: A content analysis. *New Library World*, *116*(7/8), 358–368. doi:10.1108/NLW-12-2014-0144

Morahan-Martin, J., & Schumacher, P. (2000). Incidence and correlates of pathological Internet use among college students. *Computers in Human Behavior*, *16*(1), 13–29. doi:10.1016/S0747-5632(99)00049-7

Moran, M., Seaman, J., & Tinti-Kane, H. (2012). Blogs, wikis, podcasts and Facebook: How today's higher education faculty use social media. Boston, MA: Pearson Learning Solutions.

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

Morin, B. (2013). *What is the maker movement and why should you care?* Retrieved from http://www.huffingtonpost.com/brit-morin/what-is-the-maker-movemen_b_3201977.html

Morin, B. (2013, May 2). *What is the maker movement and why should you care?* Retrieved from http://www.huffingtonpost.com/brit-morin/what-is-the-maker-movemen_b_3201977.html

Morra, S. (2013). *8 Steps to great digital storytelling*. Retrieved from http://edtechteacher.org/8-steps-to-great-digital-storytelling-from-samantha-on-edudemic/

Moulasion, H. L., & Corrado, E. M. (2011). Perspectives on cloud computing in libraries. In M. Edward (Ed.), *Corrado and Heather Lea Moulasion,Getting started with cloud computing* (pp. 3–11). Facet.

Muessig, K. E., Nekkanti, M., Bauermeister, J., Bull, S., & Hightow-Weidman, L. B. (2015). A systematic review of recent smartphone, Internet and Web 2.0 interventions to address the HIV continuum of care. *Current HIV/AIDS Reports*, *12*(1), 173–190. doi:10.100711904-014-0239-3 PMID:25626718

Mugavero, M. J., Amico, K. R., Horn, T., & Thompson, M. A. (2013). The state of engagement in HIV care in the United States: From cascade to continuum to control. *Clinical Infectious Diseases*, *57*(8), 1164–1171. doi:10.1093/cid/cit420 PMID:23797289

Muhammed, K., Isma'il Zaharaddeen, K. R., & Turaki, A. M. (2015). Cloud computing adoption in Nigeria: Challenges and benefits. *International Journal of Scientific and Research Publications*, *5*(7).

Mullen, L.B. (2010). *Open access and its practical impact on the work of academic librarians: Collection development, public services, and the library and information science literature.* Chandos Publishing.

München, S. K.G. (2001). The Public library service: IFLA/UNESCO guidelines for development. IFLA Publications.

Murray, L. (2010). Libraries like to move it, move it. *RSR. Reference Services Review*, *38*(2), 233–249. doi:10.1108/00907321011045007

Murugesan, S. (2007). Understanding Web 2.0. *IT Professional*, *9*(4).

Muthu, M. (2013). Resource Sharing In Libraries: A Vital Role of Consortia. *International Research: Journal of Library & Information Science*, *3*(1), 210–225.

Nadkarni, A., & Hofmann, S. G. (2012). Why do people use Facebook? *Personality and Individual Differences*, *52*(3), 243–249. doi:10.1016/j.paid.2011.11.007 PMID:22544987

Nagarkar, R. S. (2010). Use of mobile technology in library services. *Indian Streams Research Journal*, *3*(11), 1-4.

Nair, I., & Das, M. V. (2011). Analysis of recent studies undertaken for assessing acceptance of technology among teachers using TAM. *International Journal of Computers and Applications*, *32*(8), 38–46.

Nair, M. (2011). Understanding and measuring the value of social media. *Journal of Corporate Accounting & Finance*, *22*(3), 45–51.

Nalder, J. (2011). *My Computing Journey: What the Post-PC Era Means for Education. Tablet Computers in Education. Exploring ICT and Learning in Developing Countries*. Retrieved from http://edutechdebate.org/tablet-computersin-education/what-the-post-pc-era-means-for-education/

Nasir, R., Ponnusamy, V., & Lee, K. M. (2007). *Copyright protection in the digital era: A Malaysian perspective.* Retrieved on 23rd March, 2018 from https://mpra.ub.uni-muenchen.de/8253/1/MPRA_paper_8253.pdf

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

National Institute of Standards and Technology. (2010). *Summary of NIST cloud computing standards development efforts*. Author.

National Institute of Standards and Technology. (2011). 5 Essential Characteristics of Cloud Computing. In *Giving Meaning to Cloud Computing Jagon.* Author. Accessed on July 27, 2018 at www.inforisktoday.com/5-essential-characyeristics-cloud-computing-a-4189

Na, Y. E. (2002). Gender differences in new media use and values mobile phones and the internet. *Korean Journal of Broadcasting and Telecommunication Studies*, *16*, 77–115.

NdukweIfeanyi, G., & Chukwudi, A.E. (2013). Cost Benefits of Cloud vs. In-house IT for Higher Education. *International Journal of Computer Science and Security*, *7*(1), 1–14.

Needham, G., & Ally, M. E. (2008). *M-Libraries: Libraries on the move to provide virtual access*. London, UK: Facet Publishing.

Neethu, G. S., & Vanaja, M. N. (2017). Concept & Applications of Cloud Computing in Libraries. *International Journal of Trend in Research and Development,* 1-4. Retrieved 24th April, 2018 from http://www.ijtrd.com/papers/IJTRD8424.pdf

Neff, T. J., & Citrin, J. M. (2005). *You're in charge -- Now what?* New York: Crown.

Negi, D. S. (2014). Using mobile technologies in libraries and information centers. *Library Hi Tech News*, *31*(5), 14–16. doi:10.1108/LHTN-05-2014-0034

Newman, E. (2008). Airwalk print lauds MySpace celebrities. *Brandweek*, *49*(10), 5.

Newton, J. (2009). *Are SaaS & Cloud Computing Interchangeable Terms*. Retrieved from http://www.daniweb.com/blogs/entry3993.html

Nichols, B. (2001). *Introduction to documentary*. Bloomington, IN: Indiana University Press.

Nicole, E. (2007). The benefits of Face book "Fiends;" Social Capital and College Students' Use of Online Social Network Sites. *Journal of Computer-Mediated Communication*.

Nnadozie, A. C. (2006). Collection development activities in selected academic Libraries in Nigeria. *Nigerbibilios*, *17*(1&2), 22–27.

Northouse, P. G. (2004). *Leadership: Theory and Practice* (3rd ed.). Thousand Oaks, CA: Sage Publications, Inc.

Notthoff, N., & Carstensen, L. L. (2014). Positive messaging promotes walking in older adults. *Psychology and Aging*, *29*(2), 329–341. doi:10.1037/a0036748 PMID:24956001

Nwalo, K. I. N. (2008). Consortium Building for the Effectiveness and Sustainability of Academic and Research Library Services in the Information Age: Nigeria in perspective. *Journal of Social and Cultural Studies*, *1*(1), 10–16.

NYU. (2018). *E-books for Science & Technology Students: E-readers*. Retrieved from https://guides.nyu.edu/c.php?g=276905&p=1846484

Obi, N. C., Bulus, L. D., Adamu, G. M., & Sala'at, A. B. (2012). The Need for Safety Consciousness among Youths on Social Networking Sites. *Journal of Applied Science and Management*, *14*(1).

Oblinger, D. G., & Oblinger, J. L. (2005). *Educating the net generation*. Retrieved from www.educause.edu/educatingthenetgen/

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

Ochonogor, W. C., & Okite-Amughoro, F. A. (2018). Building an Effective Digital Library in a University Teaching Hospital (UTH) in Nigeria. In Handbook of Research on Managing Intellectual Property in Digital Libraries (pp. 184-204). IGI Global.

Ocran, T. K. (2017). Perception of students on mobile technology based library services. *Library Philosophy and Practice,* 1802.

Odine, R. O. (2011). *Marketing library and information services in academic libraries in Niger State* (Master's dissertation). University of Nigeria, Nsukka. Retrieved on 25th March, 2018 from http://www.unn.edu.ng/publications/files/images/Rita%20Project%20(2).pdf

Odini, C. (1991). Problems and Prospects of Resource Sharing in Developing Countries. *African Journal of Library, Archives sand*. *Information Sciences*, *1*(2), 93–108.

Ogedebe, P. M., Emmanuel, J. A., & Musa, Y. (2012). A survey on Facebook and Academic Performance in Nigeria Universities. *International Journal of Engineering Research and Applications*, *2*, 788–797.

Ogom, J. O., & Omini, E. U. (2017). Mobile phone applications and the utilization of library services in the University of Calabar Library, Calabar, Nigeria. G*lobal*. *The Journal of Educational Research*, *16*, 111–119.

Ogunjobi, M. (2015). Barriers to cloud computing adoption in Nigeria. *The Guardian*. Retrieved fromhttps://guardian.ng/technology/barriers-to-cloud-computing-adoption-in-nigeria/

Ojala, A., & Tyrväinen, P. (2011). Value Networks in Cloud Computing. *The Journal of Business Strategy*, *32*(6), 40–49. doi:10.1108/02756661111180122

Okeagu, G., & Okeagu, B. (2008). Networking and resource sharing in Library and Information services: The case for consortia building. *Information*. *Social Justice (San Francisco, Calif.)*, *1*(2), 255–262.

Okon, M. E., & Umoh, M. O. (2014). Marketing of information and library services in Nigerian university libraries: the way forward. *Information and Knowledge Management*, *4*(6). Retrieved on 05th January, 2018 from https://s3.amazonaws.com/academia.edu.documents/34229361/Marketing

Okpala, H.N. (2016). Making a makerspace case for academic libraries in Nigeria. *New Lib. World, 117*(9/10).

Okwoli, M. E. (2015). *Adoption of cloud computing technology for library services in National Open University of Nigerian Library* (Maters Thesis). Department of Library and Information, Nigeria, Ahmadu Bello University Zaria.

Olabisi, A. (2002). *Information Sources in Science and Technology: A New Approach*. Ibadan: Moba Printing Press.

Olabiyisi, S. O., Fagbola, T. M., & Babatunde, R. S. (2012). An exploratory study of cloud and ubiquitous computing systems. *World Journal of Engineering and Pure and Applied Sciences*, *2*(5), 148–155.

Ola, C. O., & Adegbore, A. M. 2015. Cultural heritage collections preservation and access: case of University of Ibadan. *The African Symposium: An online journal of the African Educational Research Network*, *15*(2), 50-55

Olaniran, S. (2014). Social media and changing communication patterns among students: An analysis of twitter use by University of Jos students. *Covenant Journal of Communication*, *2*(1).

Oluwatoyin, A. E. (2011). ICT, CGPA: Consequences of Social Networks In An Internet Driven Learning Society. *International Journal of Computer Trends and Technology*, *2*(2), 11–32.

Omekwu, C. O. (2006). Managing information and technology: Critical roles for librarians in developing countries. *The Electronic Library*, *24*(6), 847–863. doi:10.1108/02640470610714260

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

Omosor, U. A. (2014). Effect of technology on librarians in academic libraries in Nigeria. *Information Impact: Journal of Information and Knowledge Management, 5*(2), 203-212. Retrieved on 20th April, 2018 from https://www.ajol.info/index.php/iijikm/article/view/144661/134312

Osatuyi, B. (2013). Information sharing on social media sites. *Computers in Human Behavior*, *29*(6), 2622–2631. doi:10.1016/j.chb.2013.07.001

Oser, K. (2006). MySpace, big audience, big risks. *Advertising Age*, *77*(8), 3–25.

Owusu-Acheaw, M., & Larson, A. G. (2015). Use of Social Media and its Impact on Academic Performance ofTertiary Institution Students: A Study of Students of Koforidua Polytechnic, Ghana. *Journal of Education and Practice*, *6*(6). Available at www.iiste.org

Oyeboade, J. A. (2017). Socio-economic status, peer pressure and use of social media by undergraduate students in university of Ibadan, Ibadan, Oyo State, Nigeria. *Library Philosophy and Practice,* 1495. Retrieved http://digitalcommons.unl.edu/libphilprac/1495

Oyeleye, C. A., Fagbola, T. M., & Daramola, C. Y. (2014). The impact and challenges of cloud computing adoption on public universities in Southwestern. *International Journal of Advanced Computer Science and Applications*, *5*(8), 13–19.

Paddock, C. (2012). *Ipads in Health and Medicine: More than an Information Revolution*. Retrieved from: http://www.marcprensky.com/writing/prensky.DigitalWatixes,Digitalimmigrants parts.pdf

Padya, M. (2012). Cloud computing for libraries: A SWOT analysis. *8th Convention PLANNER-2012 IFLIBNET Centre*, 387-394.

Palfrey, J., Gasser, U., Simun, M., & Barnes, R. (2009). *Youth, creativity, and copyright in the digital age*. Retrieved on 23rd March, 2018 from https://dash.harvard.edu/handle/1/3128762

Palmer, K. L., Dill, E., & Christie, C. (2009). Where there's a will there's a way?: Survey of academic librarian attitudes about open access. *College & Research Libraries*, 70. Retrieved from http://crl.acrl.org/content/70/4/315.full.pdf+html

Pannu, A. (2015). Artificial Intelligence and its Application in Different Areas. *International Journal of Engineering and Innovative Technology,* (4), 10.

Papert, S. (1980). Mindstorms; children, computers, and powerful ideas. 1980. *Library Journal*, *105*, 1856.

Parker, G. G., Alstyne, M. W., & Choudary, S. P. (2016). *Platform Revolution: How Networked Markets are Transforming the Economy and How to Make Them Work for You*. New York: WW Norton & Co.

Parker, M. (2013). The ethics of open access publishing. *BMC Medical Ethics*, *14*(1), 16. doi:10.1186/1472-6939-14-16 PMID:23521857

Parr, B. (2008). *Ben Parr's Entrepreneurial Musings*. Retrieved from http://benparr.com/2008/08/its-time-we-defined-social-media-no-more-arguing-heres-the-definition/

Pasek, J., More, E., & Hargittai, E. (2009). Facebook and academic performance: Reconciling a media sensation with data. *First Monday*, *14*(5). doi:10.5210/fm.v14i5.2498

Patange, J. T. (2013). Marketing of library and information products and services. *Global Journal of Human Social Science Linguistics & Education, 13*(1). Retrieved on 20th February, 2018 from https://socialscienceresearch.org/index.php/GJHSS/article/view/561

Paterson, L., & Low, B. (2011). Student attitudes towards mobile library services for smartphones. *Library Hi Tech*, *29*(3), 412–423. doi:10.1108/07378831111174387

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

Patil, S. K., & Pradhan, P. (2014). Library promotion practices and marketing of Library services: A role of Library professionals. *Procedia: Social and Behavioral Sciences*, *133*, 249–254. doi:10.1016/j.sbspro.2014.04.191

Pazur, I. (2014). Attitude of the rudjer boškovic institute's scientists to the small screen mobile devices library services: A user survey. *Library Hi Tech*, *32*(4), 628–644. doi:10.1108/LHT-03-2014-0025

Pegrum, M., Oakley, G., & Faulkner, R. (n.d.). Schools going mobile: A study of the adoption of mobile handheld technologies in western Australian independent schools. *Australasia Journal*. *Educational Technology*, *29*(1), 66–81.

Peluchette, J., & Karl, K. (2008). Social networking profiles: An examination of student attitudes regarding use and appropriateness of content. *Cyberpsychology & Behavior*.

Pempek, T. A., Yermolayeva, Y. A., & Calvert, S. L. (2009). College students' social networking experiences on Facebook. *Journal of Applied Developmental Psychology*, *30*(3), 227–238. doi:10.1016/j.appdev.2008.12.010

Pereira, J. (n.d.). *Making a Makerspace: Planning and Building a Successful Makerspace*. Academic Press.

Perrine, J. (2010). *E-Books & Reading Devices*. Retrieved from http://e-booksandreaders.blogspot.com/p/references.html

Peter, J., Schouten, A., & Valkenburg, P. (2006). Friend networking sites and their relationship to adolescents' well-being and social self-esteem. *Cyberpsychology & Behavior*, *9*(5), 584–590. doi:10.1089/cpb.2006.9.584 PMID:17034326

Peter, J., & Valkenburg, P. (2009). Social consequences of the internet for adolescents: A decade of research. *Psychological Science*, *18*(1), 1–4. PMID:19152536

Peter, O. (2015). *Social Media and Academic Performance of Students in University of Lagos. Being a research project submitted to the department of educational administration, faculty of education*. University of Lagos.

Peters, C. (2010). *What is cloud computing and how will it affect libraries?* Retrieved from www.TechSoupforLibraries

Peters, M. A., & Roberts, P. (2011). *The virtues of openness: Education science and scholarship in a digital age*. Boulder, CO: Paradigm Publishers.

Petri, K. (2012). Accessibility Issues in E-books and E-book Readers. In S. Polanka (Ed.), *No Shelf Required 2: Use and Management of Electronic Books*. Chicago: American Library Association.

Pew Research Centre. (2017). Which social media platforms are most popular. *Internet, Science Computer-Mediated Communication, 13*(1). Retrieved http:jcin.indiana.edu/vol13/issue1/boyd.ellison.html

Pfaffman, J. (2008). Transforming high school classrooms with free/open source software: It's time for an open source software revolution. *High School Journal*, *91*(3), 25–31. doi:10.1353/hsj.2008.0006

Polanka, S. (2010). *No shelf required: e-books in libraries*. Chicago: American Library Association. Retrieved http://www.lib.ncsu.edu/techlending/ebooks.html

Polger, M. A., & Stempler, A. F. (2014). Out with the old, in with the new: Best practices for replacing library signage. *Public Services Quarterly*, *10*(2), 67–95. doi:10.1080/15228959.2014.904210

Pon, B., Seppala, T., & Kenney, M. (2014). Android and the Demise of Operating System-Based Power: Firm Strategy and Platform Control in the Post-PC World. *Telecommunications Policy*, *38*(11), 979–991. doi:10.1016/j.telpol.2014.05.001

Popović, K., & Hocenski, Ž. (2010, May). Cloud computing security issues and challenges. In *MIPRO, 2010 proceedings of the 33rd international convention* (pp. 344-349). IEEE.

Posner, B. (2017). *Library information sharing: Best practices and trends. Challenges and prospects*. Library Resource Sharing. Graduate Center of the City University of New York.

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

Poynder, R. (2010). Interview with Stevan Harnad: A prophet whose time has come. *Information Today, 27*(2). Available: http://www.infotoday.com/it/feb10/Poynder.shtml

Praveena, K., & Betsy, T. (2009). Application of Cloud Computing in Academia. *IUP Journal of Systems Management*, *7*(3), 50–54.

Prensky, M. (2003). Digital game-based learning. *Computers in Entertainment*, *1*(1), 21–21. doi:10.1145/950566.950596

Presentationzen.com. (2005). *Dana Atchley (1941-2000): A Digital Storytelling Pioneer*. Retrieved 07/12/2018 from https://www.presentationzen.com/presentationzen/2005/07/dana_atchley_19.html

Pryor. (2014). Implementing a 3D Printing. Heather Michele Moorefield-Lang. Makers in the library: case studies of 3D printers and maker spaces in library settings. *Library Hi Tech, 32*(4), 583–593. doi:10.1108/LHT-06-2014-0056

Pyrounakis, G., Nikolaidou, M., & Hatzopoulos, M. (2014). Building digital collections using open source digital repository software: A comparative study. *International Journal of Digital Library Systems*, *4*(1), 10–24. doi:10.4018/ijdls.2014010102

Quan-Haase, A., & Young, A. L. (2010). Uses and gratifications of social media: A comparison of Facebook and instant messaging. *Bulletin of Science, Technology & Society*, *30*(5), 350–361. doi:10.1177/0270467610380009

Rabiu, H., Muhammed, A.I., Umaru, Y., & Ahmed, H.T. (2016). *Impact of Mobile Phone Usage on Academic Performance Among Secondary School Students in Taraba State*. vlzn/p466 doi:10.19044/esj.2016

Radha, L. (2013). Application of cloud computing at library and information centres. *Research Journal of Science and IT Management*, *2*(5), 43 – 46.

Radniecki, T. & Klenke, C. (2017). Academic Library Makerspaces: Supporting New Literacies & Skills. *ACRL 2017*.

Rafferty, F. (2009). Boys should be Boys-is it that Simple? *Education Journal*, *116*, 32–33.

Rafferty, P., & Hidderley, R. (2007, July). Flickr and democratic indexing: Dialogic approaches to indexing. *Aslib Proceedings*, *59*(4/5), 397–410. doi:10.1108/00012530710817591

Rainie, L., & Smith, A. (2013). *Tablet and E-reader Ownership Update*. Available at: http://www.pewinternet.org/2013/10/18/tablet-and-e-reader-ownership-update/

Rainie, L., Smith, A., & Duggan, M. (2013). *Coming and going on Facebook*. Pew Research Center's Internet and American Life Project.

Raj, A.J., Ravi, A., Raj, K., Bichu Ben, S.A., & Datb, D. (2016). Resource Sharing via Social Networks. *International Journal of Computer Science and Information Technology & Security, 6*(2), 1-3.

Rajan, A. P. (2013). *Evolution of cloud storage as cloud computing infrastructure service.* arXiv preprint arXiv:1308.1303

RamugondoLugisani S. (2010). *An Exploratory Study of Infopreneurship as a Job Option for Library and Information Science Students: A Literature Review*. Being presentation at the 11th DIS Annual Conference 2010, 2nd–3rd September, Richardsbay, University of Zululand, South Africa.

Rapacki, S. (2007). Social networking sites: Why teens need places like myspace. *Young Adult Library Services*, 28-30. Retrieved on 24th of June, 2018 from http://files.eric.ed.gov/fulltext/EJ991339.pdf

Raut, V., & Patil, P. (2016). Use of Social Media in Education: Positive and Negative impact on the students. *International Journal on Recent and Innovation Trends in Computing and Communication*, *4*(1), 281–285.

Ray, C. R. C. (2011). The weight of memory. The New Year York Times, p. D2.

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

Reddy, T. R. (2012). Digital era: Utilize of cloud computing technology in digital library. *International Journal of Digital Library Services*, *2*(3), 92–106. Retrieved from http://www.ijodls.in/uploads/3/6/0/3/3603729/51-60.pdf

Report, H. (2010). *Two to Three Years: Electronic Books*. Retrieved from http://wp.nmc.org/horizon2010/chapters/electronic-books/

Reuver, M., Bouwman, H., &Haaker, T. (2013). Business Model Roadmapping: A Practical Approach to Come from An Existing to a Desired Business Model. *International Journal of Innovation Management*, *17*(1), 1340006-1–1340006-18.

Reuver, M. D., Sørensen, C., & Basole, R. C. (2017). The digital platform: A research agenda. *Journal of Information Technology*.

Reuver, M., Verschuur, E., Nikayin, F., Cerpa, N., & Bouwman, H. (2015). Collective Action for Mobile Payment Platforms: A Case Study on Collaboration Issues Between Banks and Telecom Operators. *Electronic Commerce Research and Applications*, *14*(5), 331–344. doi:10.1016/j.elerap.2014.08.004

Rheingold, H. (1993). *The virtual community: Finding commection in a computerized world*. Addison-Wesley Longman Publishing Co., Inc.

Richard, O. C., & Ahmad, L. (2013). Cloud Computing and Its Applications in e -Library Services: Nigeria in Focus. *International Journal of Innovation, Management and Technology*, *4*(5).

Rithika, M., & Selvaraj, S. (2013). Impact of social media on student's academic performance. *International Journal of Logistics & Supply Chain Management Perspectives*, *2*(4), 636–640.

Roberts, R. L. (2007). *Podcasting for information literacy*. Paper presented at the World Library and Information Congress: 73rd IFLA General Conference and Council Libraries for the Future: Progress, Development and Partnerships: Information Literacy Section together with the Academic and Research Libraries Section: Conduits for Transformation: Incorporating Multimodal Instruction and Learning into Information Literacy, Durban, South Africa. Retrieved from www.ifla.org/IV/ifla73/papers/133-LeeRoberts-en.pdf

Robin, B. R. (2008). Digital storytelling: A powerful technology tool for the 21st century classroom. *Theory into Practice*, *47*(3), 220–228. doi:10.1080/00405840802153916

Robin, B. R. (2018). The Power of Digital Storytelling to Support Teaching and Learning, *Digital*. *Education Review*, *30*, 17–29.

Roblyer, M. D., McDaniel, M., Webb, M., Herman, J., & Witty, J. V. (2010). Findings on Facebook in higher education: A comparison of college Faculty and student uses and perceptions of social networking sites. *Internet and Higher Education*, *13*(3), 134–140. doi:10.1016/j.iheduc.2010.03.002

Romero-Frías, E & Arquero Montaño, L. J (2012). *Exploring the use of social network sites on accounting education: a social constructivist approach.* Academic Press.

Rouis, S., Limayem, M., & Salehi-Sangari, E. (2011). *Impact of Facebook Usage on Students´ Academic Achievement: Role of self-regulation and trust*. Academic Press.

Rowlands, I., Nicholas, D., Russell, B., Canty, N., & Watkinson, A. (2011). Social media use in the research workflow. *Learned Publishing*, *24*(3), 183–195. doi:10.1087/20110306

Rowley, J. (2006). *Information Marketing* (2nd ed.). London: Ashgate.

Roy, M. B., & Kumar, N. (2017). Application of mobile technology in Library services. *International Journal Information Movement*, *2*(7), 168–172.

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

Russell, S. J., & Norvig, P. (2003). *Artificial Intelligence: A Modern Approach*. Englewood Cliffs, NJ: Prentice Hall.

Rutkin, A. (2014, July 17). Books out, 3D printers in for reinvented US libraries. *New Scientist*. Retrieved from http://www.newscientist.com/article/mg22329784.000-books-out-3d-printers-in-for-reinvented-us-libraries.html?full=true#.U-0hlkgRb_s

Rutledge International Encyclopedia of Information and Library Science. (1997). *Selective Dissemination of Information*. Rutledge.

Ryan, B. (2013). *Optimizing academic library services in the digital milieu: Digital devices and their emerging trends*. Elsevier. Retrieved on 6th January, 2018 from https://books.google.co.za/books?id=nGZEAgAAQBAJ&pg=PA27&lpg=PA27&dq

Ryan, M. D. (2012). Cloud computing privacy concerns on our doorstep. *Communications of the ACM*, *54*(1), 36–38. doi:10.1145/1866739.1866751

Sachin, K. V. (2014). Impact of use of social networking sites on libraries. *Knowledge Librarian*, (1), 116-124.

Safko, L., & Brake, D. K. (2009). *The social media bible: Tactics, tools, and strategies for business success*. John Wiley & Sons.

Sahu, R. (2015). *Cloud computing: An innovative tool for library services*. Retrieved from eprints.rclis.org/29058/i/RSahu.pdf

Salubi, O. G., Ondari-Okemwa, E., & Nekhwevha, F. (2018). Utilisation of library information resources among generation Z students: Facts and fiction. *Publications, 6*(2).

Salvation, M., & Adzharuddin, N. A. (2014, August). The influence of social network sites (SNS) upon academic performance of Malaysian students. *International Journal of Humanities and Social Science*, *4*(10[1]), 131–137.

Sanchati, R., & Kulkarni, G. (2011). Cloud Computing in Digital and University Libraries. *Global Journal of Computer Science and Technology*, *11*(12).

Sangeeta, N. D. (2013). *Cloud computing and virtualization technologies in libraries*. Retrieved 24th October, 2018 from https://www.igi-global.com/book/cloud-computing-virtualization-technologies- libraries/77387

Santos, I., Hammond, M., Durli, Z., & Chou, S. Y. (2009). Is there a role for social networking sites in education? In A. Tatnall & A. Jones (Eds.), *Education and technology for a better world. Proceedings of the 9th IFIP TC 3 World Conference on Computers in Education* (pp. 321–330). Berlin, Germany: Springer. 10.1007/978-3-642-03115-1_34

Santos, I., & Carvalho, A. (2017). Training and monitoring: A two-stage training model in teacher professional development. *Educação e Realidade*, *42*(1), 323–344. doi:10.1590/2175-623655298

Sarwar, M., & Soomro, T. R. (2013). Impact of Smart Phones on the Society. *European Journal of scientific Research*. Retrieved from http://www.europeanjornalofscientificreasearch.com

Sasikala, P. (2011). Cloud computing: Present status and future implications'. *International Journal of Cloud Computing*, *1*(1), 23–36. doi:10.1504/IJCC.2011.043244

Satpathy, S. K., Maharana, R. K., & Panda, S. K. (2012). Use of information communication technology based services by faculty members and students of premier Engineering College of Odisha. *International Journal of Digital Library Services*, *2*(3), 76–91. Retrieved from http://www.ijodls.in/uploads/3/6/0/3/3603729/51-60.pdf

Sawhney, H., & Lee, S. (2005). Arenas of innovation: Understanding new configurational potentialities of communication technologies. *Media Culture & Society*, *27*(3), 391–414. doi:10.1177/0163443705051750

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

Saxena, A., & Yadav, R. D. (2013). Impact of mobile technology on libraries: A descriptive study. *International Journal of Digital Library Services*, *3*(4), 1–13. Retrieved from http://www.ijodls.in/uploads/3/6/0/3/3603729/vol-3_issue-4_part-1.pdf

Scanfeld, D., Scanfeld, V., & Larson, E. L. (2010). Dissemination of health information through social networks: Twitter and antibiotics. *American Journal of Infection Control*, *38*(3), 182–188. doi:10.1016/j.ajic.2009.11.004 PMID:20347636

Scherrer, C. S., & Dorsch, J. L. (1999). The evolving role of the librarian in evidence-based medicine. *Bulletin of the Medical Library Association*, *87*(3), 322. PMID:10427434

Schmidt, J. (2006). Marketing library and information services in Australian academic libraries. *Marketing Library and Information Services: International Perspectives*, 120. Retrieved on 01 January, 2018 from http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.214.7367&rep=rep1&type

Schmidt, A. (2010). Touch points and testing. *Library Journal*, *135*(8), 20.

Schmidt, A. (2015). The user experience: Positive signs. *Library Journal*, *140*(14), 25.

Schmidt, A., & Etches, A. (2014). *Useful, usable, desirable: Applying user experience design to your library*. Chicago: American Library Association.

Schouten, E. (2014). *Cloud computing defined: Characteristics and service levels*. Retrieved from https://www.ibm.com/blogs/cloud-computing/2014/01/31/cloud-computing-defined-characteristics-service-levels/

Schroter, S., & Tite, L. (2006). Open Access publishing and author-pays business models: A survey of authors' knowledge and perceptions. *Journal of the Royal Society of Medicine*, *99*, 141–148. PMID:16508053

Schulten, K. (2000). *The learning network blog*. Retrieved June 10 208 from learning blogs: nytimes.com/2009/12/21

Scott, H. (2012). Making the case for a public library makerspace. *Public Libraries Online*. Retrieved from http://publiclibrariesonline.org/2012/11/making-the-case-for-a-public-library-makerspace/

Scott, J. P. (Ed.). (2006). *Documentary research*. Thousand Oaks, CA: Sage Publications.

Scott, P. R., & Jacka, J. M. (2011). *Auditing social media: A governance and risk guide*. John Wiley & Sons.

Senge, P. M. (1994). *The fifth discipline: The art and practice of the learning organization*. New York: Doubleday/Currency.

Senge, P. M. (2000). *Schools that learn: A fifth discipline fieldbook for educators, parents, and everyone who cares about education*. New York: Doubleday.

Serfass, M. (2012). The signs they are a-changing': Is it time to give your library's signage a makeover? *AALL Spectrum*, *16*(9), 5–6.

Sethi, W. T., Alfakhri, A., Ashraf, M. A., Alasaad, A. G., & Alshebeili, S. (2017). *State-of-the-Art-Antenna Technology for Cloud Radio Acess Networks. (C-RANs). In Cloud Computing - Architecture and Applications* (J. Sen, Ed.)., doi:10.5772/67352

Sharma, D., & Sahoo, D. R. (2014). Application of Mobile Technology in Library Services: An Overview. *International Journal of Information Technology and Library Science*, *3*(1), 17–24.

Shear, B. (2010). *Copyright protection in the digital age*. Association of Corporate Counsel. Retrieved on 26th March, 2018 from http://www.acc.com/legalresources/quickcounsel/icpituscaeu.cfm?makepdf=1

Sheldon, P. (2008). Student favorite: Facebook and motives for its use. *Southwestern Mass Communication Journal*, *23*(2), 39–53.

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

Sherer, P., & Shea, T. (2011). using online video to support student learning engagement. *College Teaching*, *59*(2), 56–59. doi:10.1080/87567555.2010.511313

Shivalingaiah, D., & Naik, U. (2011). Social networking tools: social bookmarking and social tagging. In *Proceedings of the 8th International CALIBER-2011, Goa University, Goa*. Ahmedabad: INFLIBNET Centre; Retrieved from http://ir.inflibnet.ac.in/bitstream/1944/1600/1/7.pdf

Siibak, A. (2009). Constructing the self through the photo selection- Visual impression management on social networking websites. *Journal of Psychological Research on Cyberspace*, *3*(1), 1–6. Retrieved from http://www.cyberpsychology.eu/view.php

Si, L., Shi, R., & Chen, B. (2011). An investigation and analysis of the application of Web 2.0 in Chinese university libraries. *The Electronic Library*, *29*(5), 651–668. doi:10.1108/02640471111177080

Sinclair, S., Bramley, G., Dobbie, L., & Gillespie, M. (2007). *Social inclusion and communications: a review of the literature*. Communications Consumer Panel.

Singh, R., & Shukla, A. (2009). Role of marketing strategy in academic libraries: A study. *International Conference of Academic Libraries (ICAL)*. Retrieved on 28th March, 2018 from http://crl.du.ac.in/ical09/papers/index_files/ical-108_103_233_2_RV.pdf

Singh, K., & Nikandia, P. K. (2017). Role of mobile technology and application in library services in digital era. *Journal of Library and Information Science*, *7*(1), 2–10.

Sin, S. C. J., & Kim, K. S. (2013). International students' everyday life information seeking: The informational value of social networking sites. *Library & Information Science Research*, *35*(2), 107–116. doi:10.1016/j.lisr.2012.11.006

SIPX. (2014). *How SIPX Works*. Retrieved from: http://www.sipx.com/the-sipxsolution/ how-sipx-works/

Slaheddine, M. (2012). *Cloud computing in Africa, situation and perspective*. Regulatory and Market Environment Division IEE/BDT/ITU.

Slatter, D., & Howard, Z. (2013). A place to make, hack, and learn: Makerspaces in Australian public libraries. *The Australian Library Journal*, *62*(4), 21–30. doi:10.1080/00049670.2013.853335

Smeda, N., Dakich, E., & Sharda, N. (2014) The effectiveness of digital storytelling in the classrooms: a comprehensive study. Smart Learning Environments, 6(1).

Smith, A. (2010). Social media & mobile internet use among teens and young adults. *Pew Research Center's Internet & American Life Project,* 1-37. Retrieved from http:// web.pewinterne t.org/~/ media/Files /Reports/2010/PIP_Social _Media_and_Young_Adults_Report_Final_with_toplines.pdf

Smith, E., & Shirer, M. (2018). *Worldwide Public Cloud Services Spending Forecast to Reach $160 Billion This Year, According to IDC*. Retrieved 24th November 2018 from https://www.idc.com/getdoc.jsp?containerId=prUS43511618

Smith, B., & Jacobs, M. (2010). Libraries and patrons on the move: From bookmobiles to "m" libraries. *RSR. Reference Services Review*, *38*(2), 21–30. doi:10.1108/rsr.2010.24038baa.002

Social Media Online. (2011). *Social Media*. Accessed: www.creativemediafarm.com/information/glossary

Sood, S. K., & Mukherjee, I. (2013). Mobile technology in emerging library and information services. *Conference Papers; SPL Annual Convention (NCLTDP-2013),* I 211-I 218.

Sorav, J. (2010). *Most Popular Social Networking Sites of the World*. Retrieved 28 January 2011 from: http://socialmediatoday.com/soravjain/195917/40-mostpopular-socialnetworking-sites-world

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

Spatz, S. (2018). *The 3 Biggest Trends In Publishing Right Now*. Retrieved from https://writingcooperative.com/the-3-biggest-trends-in-publishing-right-now-c6008ffb889b

Sponcil, M., & Gitimu, P. (2013). Use of social media by college students: Relationship to communication and self-concept. *Journal of Technology Research*, *4*, 1.

Springer. (2018). *Open access is the future – Springer Nature survey*. Retrieved https://www.researchinformation.info/news/open-access-future-%E2%80%93-springer-nature-survey

Starkweather, W., & Stowers, E. (2009). Smartphone: A potential discovery tool - *ProQuest. Information Technology and Libraries*, *28*(4), 187–188. doi:10.6017/ital.v28i4.3231

Statista. (2017). *World report on social media usage*. Retrieved from http://www.statista.com/statistics/272014/global-social-networks-ranked-by-number-of-users/

Stein, L. D. (2010). The case for cloud computing in genome informatics. *Genome Biology*, *11*(5), 207. doi:10.1186/gb-2010-11-5-207 PMID:20441614

Stephens, M. (2006). Instant messaging. In *Web 2.0 and libraries: Best practices for social software.* Chicago: ALA. Retrieved 07/12/2018 from http://thehyperlinkedlibrary.org/libtechreport1/chapter-4 instantmessaging/

Sternberg, R. J. (1987). Intelligence. In The Oxford Companion to the Mind. Oxford, UK: Oxford University Press.

Strand, C. (2012). Blogging: a new tool for coping and accessing psycho-social support for people living with HIV? In E-Health communities and online self-help groups: Applications and usage (pp. 106-120). IGI Global. doi:10.4018/978-1-60960-866-8.ch007

Suber, P. A. (2004). *Very Brief Introduction to Open Access*. Retrieved from: http://legacy.earlham.edu/~peters/fos/brief.htm

Subhulakshmi, R., Suryagandhi, S., Mathubala, R., & Sumathi, P. (2016). An evaluation on Cloud Computing Research Challenges and Its Novel Tools. *International Journal of Advanced Research in Basic Engineering Sciences and Technology*, *2*(19), 69–76.

Sun Microsystem Inc. (2009). *Introduction to cloud computing architecture*. Retrieved from staff.polito,it/alessandro.mantelero/cloud_computing/sun_wp2009.pdf

Svahn, F., Lindgren, R., & Mathiassen, L. (2015). Applying Options Thinking to Shape Generativity in Digital Innovation: An Action Research into Connected Cars. *49th Hawaii International Conference on System Science (HICSS 49)*, 4141–4150.

Swain, D. K. (2014). Cloud computing and its application in library management: A review of research. *e-Library Science Research Journal, 2*(4). Retrieved from https://www.researchgate.net/publication/298721580_Cloud_computing_and_its_application_in_library_management

Tager, M. J. (2004). What people really need from a change leader. *Leader to Leader*, *21*(4), 6–9. doi:10.1002/ltl.56

Taggart, T., Grewe, M. E., Conserve, D. F., Gliwa, C., & Isler, M. R. (2015). Social media and HIV: A systematic review of uses of social media in HIV communication. *Journal of Medical Internet Research*, *17*(11), e248. doi:10.2196/jmir.4387 PMID:26525289

Tait, E., Martzoukou, K., & Reid, P. (2016). *Libraries for the future: The role of IT utilities in the transformation of academic libraries*. Retrieved on 7th January, 2018 from https://www.nature.com/articles/palcomms201670.pdf

Tandon, A. (2014). Implementing and developing cloud computing on web application. *International Journal of Computer Science and Mobile Computing*, *3*(2), 153–157.

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

Tashjian, K. (2014). *Learn about the makerspace movement*. Retrieved from http://allaccessri.org/2014/03/12/learn-about-the-makerspace-movement/

Tata, S. (2012). *Cloud platforms: Concepts, definitions, architectures and open issues*. Retrieved from www.lifl.fr/iwaise12/presentation/tata.pdf

Tavluoglu, C., & Korkmaz, A. (2014). *Cloud computing for libraries*. Retrieved from https://www.atilim.edu.tr/files/Kutuphane/Yay%C4%B1nlar%C4%B1m%C4%B1z/Sunum/AyseKorkmazBOBCATSSS2014.PDF

Taylor and Francis Group. (2014). *Use of Social Media by the library current practices and Future opportunities*. Retrieved from www.tandf.co.uk/journals/access/white-paper-social-media.pdf

Taylor, A. S., & Harper, R. (2003). *Talking Activity: Young People and Mobile Phone, CHI, 2001 Workshop: Mobile Communication*. Seattle, WA: Understanding Users, Adoption and Design.

Techataweewan, W. (2012). Perceptions and use of Web 2.0 of Thai academic librarians. Academic Press.

Tella, A. (2018). *Reference and information sources and services*. A Course material/Class Note for Undergraduate Students. Kwara State University, Malete, Ilorin.

Tella, A., Innocent, E., Akanbi-Ademolake, H. A., & Oso, T. (2018). (in press). Perception, Use and Effectiveness of Open Source Library Systems by Academic Librarians in Selected Tertiary Institutions in Kwara State, Nigeria. *African Journal of Information System*, *14*(2).

Terzí, B., Bulut, S., & Kaya, N. (2019). Factors affecting nursing and midwifery students' attitudes toward social media. *Nurse Education in Practice*, *35*, 141–149. doi:10.1016/j.nepr.2019.02.012 PMID:30825708

Thanuskodi, S. (2012). Awareness of library 2.0 applications among library and information 234 Science professionals at Annamalai University, India. *International Journal of Library Science*, *1*(5), 75–83. doi:10.5923/j.library.20120105.02

The Ocean City Free Public Library. (2018). E-*READER 101: Info for E-readers*. Retrieved http://www.oceancitylibrary.org/E-Reader-101/

The World Health Report. (2001). *Mental Health: New Understanding, New Hope*. Retrieved from: https://en.wikipedia.org/wiki/Mental_health

Thompson, J. (2007). Is education 1.0 ready for web 2.0 students? *Innovate (North Miami Beach, Fla.)*, *3*(4).

Tınmaz, H. (2013). *Sosyal Ağ Web Siteleri ve Sosyal Ağların Eğitimde Kullanımı*. Kürşat Çağıltay ve Yüksel.

Tiwana, A. (2014). *Platform Ecosystems: Aligning Architecture, Governance, and Strategy*. Morgan Kaufmann. doi:10.1016/B978-0-12-408066-9.00001-1

Tomer, C., & Alman, S. W. (2011). Cloud Computing for LIS Education. In Getting Started with Cloud Computing. Facet.

Trivedi, M., & Suthar, V. (2011). A plan of M-Library for Smt. Hansa Mehta Library: A study. *International Journal of Information and Communication Technology Research*, *1*(3).

Trusov, M., Bucklin, R., & Pauwels, K. (2009). Effects of word of-mouth versus traditional marketing: Findings from an internet social networking site. *Journal of Marketing*, *73*(5), 90–102. doi:10.1509/jmkg.73.5.90

Tufekci, Z. (2008). Grooming, gossip, facebook, and myspace. *Information Communication and Society*, *11*(4), 544–564. doi:10.1080/13691180801999050

Tuncay, W. (2010). *Effective use of cloud computing in educational institution*. Academic Press.

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

Tuncay, E. (2010). Effective use of cloud computing in educational institutions. *Procedia: Social and Behavioral Sciences*, *2*(2), 938–942. doi:10.1016/j.sbspro.2010.03.130

Tuominen, K., Talja, S., & Savolainen, R. (2002). Discourse, cognition and reality: Toward a social constructionist meta-theory for library and information science. In *Proceedings of the Fourth International Conference on Conceptions of Library and Information Science* (pp. 271-283). Greenwood Village, CO: Libraries Unlimited.

Tuominen, M. (2004). Channel collaboration and firm value proposition. *International Journal of Retail & Distribution Management*, *32*(4/5), 178–189. doi:10.1108/09590550410528953

Turan, B., Cohen, C. R., Bukusi, E. A., Turan, J. M., Stringer, K. L., Onono, M., & Weiser, S. D. (2014). Linkage to HIV care, postpartum depression, and HIV-related stigma in newly diagnosed pregnant women living with HIV in Kenya: A longitudinal observational study. *BMC Pregnancy and Childbirth*, *14*(1), 400. doi:10.118612884-014-0400-4 PMID:25467187

Turkle, S. (2004). Preference for online social interaction. *The Chronicle of Higher Education*.

Turner, D. (2009). *Conceptualizing oral documents* (Unpublished doctoral dissertation). University of Washington, Seattle, WA.

Tweeternet.com. (2018). *Twitter*. Available at: www.tweeternet.com

Ubogu, J. O. & Okiy, R. B. (2011). Sources of funds in academic libraries in Delta State, Nigeria. *Library Philosophy and Practice*.

Ueda, H., & Nakamura, M. (2016). GakuNinMoodle: Toward robust E-learning services using Moodle in Japan. *Procedia Computer Science*, *96*, 1710–1719. doi:10.1016/j.procs.2016.08.219

Ukachi, N. B., Onuoha, U. D., & Nwachukwu, V. N. (2014). Students' attitudes as a determining factor to electronic information resources use in university libraries in South-West, Nigeria. *DESIDOC Journal of Library and Information Technology*, *34*(4), 333–341. doi:10.14429/djlit.34.6269

Ultanir, E. (2012). An epistemological glance at the learning in Dewey, Piaget, and Montessori. *International Journal of Instruction*, *5*(2), 195–212. Retrieved from https://eric.ed.gov/?id=ED533786

University of Pennsylvania. (2019). *Open Access Resources: Open Access Policies*. Retrieved from https://guides.library.upenn.edu/oa/oapolicies

University of Waterloo. (2010). *Introduction to cloud computing*. Retrieved from https://csuwaterloo.ca/~a78khan/courses-offered/cs446/2010_05/lecture.slides/16_cloudcomputing

Urhiewhu, O. L., Aji, S. B., & Polygon, G. (2015). Global Tools for Resource Sharing among Academic libraries in Nigeria. *International Academic Journal of Educational Research*, *1*(1), 34–41.

Urista, M. A., Dong, Q., & Day, K. D. (2009). Explaining why young adults use myspace and facebook through uses and gratifications theory. *Human Communication*, *12*(2), 215–229.

Vafa, S., & Chico, D. E. (2013). A Needs Assessment For Mobile Technology Use in Medical Education. *International Journal of Medical Education*, *4*(4), 230–235. doi:10.5116/ijme.5259.4a88

Valdiserri, R. O., Tama, G. M., & Ho, M. (1988). A survey of AIDS patients regarding their experiences with physicians. *Academic Medicine*, *63*(9), 726–728. doi:10.1097/00001888-198809000-00011 PMID:3418679

Van Dijck, J., &Poell, T. (2013). *Understanding social media logic*. Academic Press.

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

Vaquero, L., Rodero-Merino, L., Caceres, J., & Lindner, M. (2009). A Break in the Clouds: Towards a Cloud Definition. *Computer Communication Review*, *39*(1), 50–55. doi:10.1145/1496091.1496100

Veenstra, R. J. (1992). Clinical medical librarian impact on patient care: A one-year analysis. *Bulletin of the Medical Library Association*, *80*(1), 19. PMID:1537012

Ventola, C. L. (2014). Social media and health care professionals: Benefits, risks, and best practices. *P&T*, *39*(7), 491. PMID:25083128

Vila, M. C., Galvez, A. P., & Campos, J. C. (2010). Mobile services in the Rector Gabriel Ferrate Library, Technical University of Catalonia. *RSR. Reference Services Review*, *38*(2), 321–334. doi:10.1108/00907321011045070

Virkus, S., & Bamigbola, A. A. (2011). Students' conceptions and experiences of Web 2.0 tools. *New Library World*, *112*(11/12), 479–489. doi:10.1108/03074801111190473

Vishwakarma, M. L., Maurya, S. L., & Govil, S. (2013). Use of Mobile Technology in Indian Libraries. *International Journal of Engineering and Computer Science*, *2*(6), 1799–1805.

Voigt, C. (2008). *Educational design and media choice for collaborative, electronic case-based learning* (PhD thesis). University of Technology Ilmenau. Retrieved July 9 2018 from citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.154.6198

Vollmer, T. (2010). There's an app for that! Libraries and mobile technology: An introduction to public policy considerations. *ALA Office for Information Technology Policy*, 1-13. Retrieved from http://www.ala.org/offices/sites/ala.org.offices/files/ content/oitp/publications/policy briefs/mobiledevices.pdf

Von Muhlen, M., & Ohno-Machado, L. (2012). Reviewing social media use by clinicians. *Journal of the American Medical Informatics Association*, *19*(5), 777–781. doi:10.1136/amiajnl-2012-000990 PMID:22759618

Vucovich, L. A., Gordon, V. S., Mitchell, N., & Ennis, L. A. (2013). Is the time and effort worth It? One library's evaluation of using social networking tools for outreach. *Medical Reference Services Quarterly*, *32*(1), 12–25. doi:10.1080/02763869.2013.749107 PMID:23394417

Vygotsky, L. (1978). *Mind in society*. Cambridge, MA: Harvard University Press.

Wada, I. (2018). Cloud computing implementation in libraries: A synergy for library services optimization. *International Journal of Library and Information Science*, *10*(20), 17–27.

Waheed, M., Kaur, K., Ain, N., & Hussain, N. (2016). Perceived learning outcomes from Moodle: An empirical study of intrinsic and extrinsic motivating factors. *Information Development*, *32*(4), 1001–1013. doi:10.1177/0266666915581719

Wakimoto, D. K. (2015). Librarians and graphic design: Preparation, roles, and desired support. *Public Services Quarterly*, *11*(3), 171–182. doi:10.1080/15228959.2015.1054545

Walia, P., & Gupta, M. (2012). Application of Web 2.0 tools by national libraries. *Webology, 9*(2), 13-13. Available at http://www.webology.org/2012/v9n2/a99.html

Walker, A. (2018). *What Is Cloud Computing? Everything You Need to Know About the Cloud*. Retrieved 24th November, 2018 fromhttps://learn.g2crowd.com/cloud-computing

Walsh, G. (2016). Screen and Paper Reading Research – A Literature Review. *Australian Academic and Research Libraries*, *47*(3), 160–173. doi:10.1080/00048623.2016.1227661

Walters, W. H. (2013). E-books in academic libraries: Challenges for sharing and use. *Journal of Librarianship and Information Science*, *46*(2), 85–95. doi:10.1177/0961000612470279

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

Wang, Chen, & Liang. (2011). *The Effects of Social Media on College Students*. The Alan Shawn Feinstein Graduate School. Providence, RI: Johnson & Wales University.

Wang, Q., Chen, W., & Liang, Y. (2011). *The effects of social media on college students.* Academic Press.

Wang, F., Wang, W., Wilson, S., & Ahmed, N. (2016). The state of library makerspaces. *International Journal of Librarianship*, *1*(1), 2–16. doi:10.23974/ijol.2016.vol1.1.12

Wang, L., von Laszewski, G., Younge, A., He, X., Kunz, M., & Tao, J. (2010). Cloud computing:A perspective study. *New Generation Computing*, *28*(2), 137–146. doi:10.100700354-008-0081-5

Wang, W., Zeng, G., Tang, D., & Yao, J. (2012). Cloud-DLS: Dynamic trusted scheduling for Cloud computing. *Expert Systems with Applications*, *39*(3), 2321–2329. doi:10.1016/j.eswa.2011.08.048

Warren & Epp. (2016). Case Study of Libraries: Library Space and Signage Kindness Audits: What Does Your User See? *Partnership: The Canadian Journal of Library and Information Practice and Research, 11*(1).

Wasko, M. M. L., Teigland, R., & Faray, S. (2009). The Provision of Online Public Goods: Examining Social Structure in an Electronic Network of Practice. *Decision Support Systems*, *47*(3), 254–265. doi:10.1016/j.dss.2009.02.012

Watson, R. (2015). Ethics and open access. *Nursing Open*, *2*(2), 47–48. doi:10.1002/nop2.21 PMID:27708800

Way, D. (2010). The open access availability of library and information science literature. *College & Research Libraries, 71*(4). Retrieved from http://crl.acrl.org/content/71/4/302.f ull.pdf+html

We Are Social. (2017). *Digital in 2017: Global overview*. Retrieved January 20th 2018 from https://wearesocial.com/special-reports/digital-in-2017-global-overview

Weitzen, H. S. (1998). *Infopreneurs: TurningDataintoDollars*. New York: John Wiley and Sons.

Wellcome, T. (2004). *Cost and business models in scientific research publishing*. Available at http://www.wellcome.ac.uk/assets/wtd003184.pdf

West, A., Lewis, J., & Currie, P. (2009). Students' facebook 'friends': Public and private spheres. *Journal of Youth Studies*, *12*(6), 615–627. doi:10.1080/13676260902960752

What is academic library? (2018). Retrieved fromhttps://www.igi-global.com/dictionary/use-cmc-technologies-academic-libraries/229

What is information resource. (2018). Retrieved from https://www.igi-global.com/dictionary/information-resource/14466

What is library services. (2018). Retrieved from https://www.igi-global.com/dictionary/information-literacy-support-online-students/17103

Wikipedia. (2018a). *Expert System*. Accessed on July 22, 2018 at https://en.wikipedia.org/wiki/Expert_system

Wikipedia. (2018b). *Natural Language Processing*. Accessed on July 22, 2018 at https://en.wikipedia.org/wiki/Natural_language_processing

Wikipedia. (2018c). *Pattern Recognition*. Accessed on July 22, 2018 at https://en.wikipedia.org/wiki/Pattern_recognition

Wikipedia. (2018d). *Robotics*. Accessed on July 22, 2018 at https://en.wikipedia.org/wiki/Robotics

Williams, Boyd, Densten, Chin, Diamond, & Morgenthaler, (2009). Social Networking Privacy Behaviors and Risks. In *Proceeding of CSIS Research Day*. Seidenberg School of CSIS, Pace University.

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

Williams-Jones, B., Belisle Pipon, J. C., Smith, E., & Boulanger, R. (2014). *Ethical challenges of open-access publishing*. Retrieved from http://www.universityaffairs.ca/opinion/in-my- opinion/ethical-challenges-of-open-access-publishing/

Willinsky, J., & Alperin, J. P. (2011). The academic ethics of open access to research and scholarship. *Ethics and Education*, *6*(3), 217–223. doi:10.1080/17449642.2011.632716

Wilson, C. (2018). *What is Digital Storytelling and How to Get Started*. Athabasca University E-LAB. Retrieved 07/09/2018 from http://elab.athabascau.ca/workshop/digital-storytelling

Wilson, T. (2012). *Community Reporting and Citizens Journalism: A Venn Diagram*. Discussion Paper from the Institute of Community Reporters- June 2012 Part of People's Voice Media Charity.

Winston, P. H. (1999). *Artificial Intelligence*. New Delhi: Addison Wesley.

Wong-Welch, J. & Keven. J, K. (2018). The ROI of Sustaining an Academic Library Makerspace. *CNI 2018 Spring*.

Woodford, C. (2018). *Cloud computing*. Retrieved from https://www.explainthatstuff.com/cloud-computing-introduction.html

Wright, N. (2015). A case for adapting and applying continuance theory to education: understanding the role of student feedback in motivating teachers to persist with including digital technologies in learning. *Teachers and Teaching, 21*(4), 459-471.

WRLC. (2017). *WRLC-Resources*. Washington Research Library Consortium. Retrieved December 31, 2017, from http://www.wrlc.org

Wu, Y., Wu, C., Li, B., Zhang, L., Li, Z., & Lau, F. (2015). Scaling social media applications into geo-distributed clouds. *IEEE/ACM Transactions on Networking*, *23*(3), 689–702. doi:10.1109/TNET.2014.2308254

Wyatt, A. M., & Hahn, S. E. (2011). Copyright concerns triggered by Web 2.0. *RSR. Reference Services Review*, *39*(2), 303–317. doi:10.1108/00907321111135501

Xuemao, W., & Chang. (2006). *World library and information congress*. 72nd IFLA general conference and council, Seoul, South Korea. Available at http://www.ifla.org/IV/ifla72/index.htm

Xu, X. (2012). From cloud computing to cloud manufacturing. *Robotics and Computer-integrated Manufacturing*, *28*(1), 75–86. doi:10.1016/j.rcim.2011.07.002

Yagnik, S., Thakkar, P., & Kotecha, K. (2014). Recommending tags for new resources in social bookmarking system. *International Journal of Data Mining & Knowledge Management Process*, *4*(1), 19–32. doi:10.5121/ijdkp.2014.4102

Yeboah-Boateng, E. O., & Essandoh, K. A. (2014). Factors influencing the adoption of cloud computing by small and medium enterprises in developing economies. *International Journal of Emerging Science and Engineering*, *4*(2), 2319–6378.

Yi, Z. (2016). Effective techniques for the promotion of library services and resources. *Information Research, 21*(1). Retrieved on 01st January, 2018 from http://InformationR.net/ir/21-1/paper702.html

Yildiz, E. P., Tezer, M., & Uzunboylu, H. (2018). Student opinion scale related to Moodle LMS in an online learning environment: Validity and reliability study. *International Journal of Interactive Mobile Technologies*, *12*(4), 97–108. doi:10.3991/ijim.v12i4.9205

Yi, Z. (2014). Australian Academic Librarians 'Perceptions of Effective Web 2.0 Tools Used to Market Services and Resources. *Journal of Academic Librarianship*, *40*(3), 220–227. doi:10.1016/j.acalib.2014.02.009

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

Yonazi, E. (2012). *The Transformational Use of Information and Communication Technologies in Africa*. The World Bank and the African Development Bank, with the support of the African Union.

Young, S. D. (2012). Recommended guidelines on using social networking technologies for HIV prevention research. *AIDS and Behavior*, *16*(7), 1743–1745. doi:10.100710461-012-0251-9 PMID:22821067

Youtube.com. (2018). *YouTube*. Available at: www.youtube.com

Yusuf, F., & Iwu, J. (2010). Use of academic library: A case study of Covenant University, Nigeria. *Chinese Librarianship: an International Electronic Journal*, *30*. Retrieved from http://www.iclc.us/cliej/cl30YI.pdf

Yuvaraj, M. (2013). Cloud Computing Applications in Indian Central University libraries: A study of librarians use. *Library Philosophy and Practice*. Retrieved from http://digitalcommons.unl.edu/libphilprac/992/

Yuvaraj, M., & Singh, A. P. (2012). Cloud Computing in Conjunction with Libraries: Descriptive Literature Review. *Asia Pacific Journal of Library and Information Science, 2*(2).

Zadeh, S. K., Veisi, A. G., & Zadeh, E. K. (2013). Web 2.0 and Libraries. *Advanced Research.* Available at http://www.journalijar.com

Zanoon, N., Al-Haj, A., & Khwaldeh, S. M. (2017). Cloud computing and big data is there a relation between the two: A study. *International Journal of Applied Engineering Research*, *12*(17), 6970-6982.

Zell, H. M. (2013). *Print vs. electronic, and the 'digital revolution' in Africa*. Hans Zell Publishing, Retrieved from http://arthurattwell.com/2013/01/21/at-tedxaims-tech-spreads-slowly/#more-647 http://www.huffingtonpost.com/2011/08/10/digital-publishing-print-_n_923307.html[REMOVED HYPERLINK FIELD]

Zulu, Z. (2015). *An assessment of resource sharing activities among libraries in Zambia* (Unpublished MLIS Dissertation). University of Zambia.

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

About the Contributors

Adeyinka Tella is a senior lecturer in the Department of Library and Information Science, Faculty of Communication and Information Sciences, University of Ilorin, Nigeria. Tella is a commonwealth scholar who finished his PhD in September 2009 from the Department of Library and Information Studies; University of Botswana. Tella was rated no 28 scientist in Nigeria and no 1 in his University in the ranking of scientist in Nigeria released by Webometrics in March, 2015. In 2007, he was awarded small grant for thesis writing for the PhD students' category by the council for the development of social science research in Africa (CODESRIA). Tella is now a three times winner of the prestigious Dr. T.M. Salisu award for the Most Published Librarian for the year 2015, 2017 and 2018 by the Nigerian Library Association. His research areas include e-learning, information literacy, information communication technology, psychology of information, etc.

* * *

Jane Igie Aba was a Deputy Librarian at the University of Agriculture, Makurdi, Benue State until her appointment as the university librarian of Ambrose Alli University Library, Ekpoma, Edo State. Dr. (Mrs.) Jane I. Aba was born on 6th July, 1962 in Benin City, Edo State. She attended Ansar-Ud-Deen Grammar School, Lagos State from 1976 – 1981. She proceeded to Project T.I.M.E. College of Education, Lagos State from 1984 – 1987 and bagged her N.C.E. in 1987. In a quest for more academic experience, she went to Bayero University, Kano from 1989 – 1996 where she had her Bachelor of Arts degree in Library Science (BA.LS) and Masters in Library Science (MLS) respectively. She further proceeded for another Master's programme in Business Administration (MBA) in Ambrose Alli University, Ekpoma from 2000 – 2002. With her unrelentless dogged quest for greater academic experience in 2007, she went for her Doctor of Philosophy programme in Library and Information Science (Ph.D) in University of Nigeria Nsukka and bagged her Ph.D. in 2013. Dr. (Mrs.) Jane I. Aba Aba is member of Nigerian Library Association (NLA) & Certified Librarian by Librarians' Registration Council of Nigeria (LRCN). Her area of interests are Application of Computer Technologies to Library Services, library administration, personality traits and information behavior.

Adekanmi A. Adegun is a Lecturer II in the Department of Computer Science, Landmark University, Omu-Aran. His area of research includes Machine Learning, Data Mining and Application of Deep Learning for Image Processing. He holds B. Tech. in Computer Science from LadokeAkintola University, Ogbomosho, M.Sc. Computer Science from University of Ibadan and currently undergoing his PhD in Computer Science at the University of Kwazulu-Natal, South Africa. He is a member of Computer Professionals (Registration Council of Nigeria) (CPN).

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

Kayode Wale Adewuyi was born at Ilorin, Kwara State Nigeria on Oct. 24th 1982. He obtained his Higher National Diploma in Library and Information Science from the Federal Polytechnic Offa (Kwara State). He is currently working as a School Librarian at Faith Academy (Ilorin). He is also a ghostwriter to hundreds of papers, articles and letters. Additionally, his postgraduate diploma In Information Management is in view.

Abiola G. Afolabi is a Higher Library Officer with Michael Imoudu National Institute for Labour Studies (MINILS), Nigeria. Her areas of interest are Library Education, Serials Management, Indexing, Abstracting and Library Economy. She obtained Nigeria Certificate in Education (NCE) in Mathematics and Economics from the Kwara State College of Education, Ilorin and Bachelor of Science Education in Library Science Education, Ekiti State University, AdoEkiti. She is married.

Joel O. Afolayan works with Michael Imoudu National Institute for Labour Studies (MINILS), Nigeria as Principal Library Officer with research interest including Knowledge Management, Organisation of Knowledge, Cloud Librarianship, Trade Unionism, Emotional and Artificial Intelligence, Developmental and Comparative Studies. He is a member of the Institute of Information and Records Management (TIIREM), Nigeria; Records and Information Management Awareness Foundation (RIMAF) and; Nigeria Library Association (NLA) where he had served in various capacities and now as the Secretary of the Kwara State Chapter. He holds National Diploma and Higher National Diploma in Library and Information Sciencefrom the Federal Polytechnic, Offa; Post Graduate Diploma in Education (PGDE) from the National Teachers' Institute (NTI), Kaduna; Bachelor of Science in Library and Information Science. He is married.

Evelyn Olakitan Akinboro was born 54 years ago at Owo, ondo state of Nigeria. She graduated with Bachelor of Arts degree from University of Ife (now Obafemi Awolowo University) in 1975. She got Masters and PH.D in library studies from university of Ibadan in 1981 and 2006 respectively. She worked in the library of National Cereals research Institute, Moor Plantation Ibadan. Presently, she is a senior librarian in the university library. She has worked in several units of the library, but now the chief cataloguer. She has attended many professional conferences, workshops and seminars by the Nigerian Library Association. She has many journal publications to her credit. She has served on many committees and boards of the University. Her research interests are in the area of cataloguing, Grey literature and information literacy.

Ayodele John Alonge is a Lecturer at Department of Library Archival and Information Studies, Faculty of Education, University of Ibadan, Nigeria. He holds PhD in Communication and Information Studies from the School of Journalism and Mass Communication, University of Nairobi, Kenya; Master of Publishing and Copyright Studies (MPCS) and Bachelor of Library and Information Studies (B.LIS) from the Department of Library, Archival and Information Studies, University of Ibadan, Nigeria. He is a CARTA Graduate and he is a Certified Librarian of Nigeria (CLN). Prior joining the University as academic in 2013, he worked as Librarian and Social Media Coordinator for KPMG Nigeria. He serves as Brand Ambassador -Sub-Saharan Africa Region for Emerald Group Publishing, United Kingdom. He is the Coordinator of the Nigeria Library Association (NLA) Digital communication Crew with re-

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

sponsibility of managing social media platforms of the association. Also Dr. A.J. Alonge is Chairperson of Library Education & Training Institutions Section of African Library & Information Associations and Institutions (AfLIA) He has deep interest includes -Information Technologies in Libraries, Digital Library, Health Information System, and Health Communication, new media, e-Library, e-Publishing, and Social media for communication. He is happily married.

Ajani Yusuf Ayodeji is a free-lance librarian who has worked with various academic institutions and different non-governmental Organization in Kwara State Ilorin, Nigeria. These includes: Kwara State Polytechnic, University of Ilorin and Al-Hikmah University, among others. Ayodeji, a graduate of Library and Information Science, University of Ilorin, and currently a graduating postgraduate student of same institution from the same department is highly motivated, passionate with exceptional leadership and interpersonal relations skills. Ayodeji, is a public speaker who engage his audience into a serious thinking and also a consultant on academic issues. He loves meeting new people and always trying to make differences in the lives of others. Ayodeji acquire is first degree in the field of Library and Information Science in the year 2013 and his Postgraduate diploma in Education in the year 2017. He is a good team player with a focused interest in Information and knowledge Management. Ayodeji always puts in his best into his work using available resources to achieve desired results without compromising professional standards and personal integrity.

M. T. Bashorun (CLN) is a senior lecturer in the Department of Library and Information Science, University of Ilorin, Nigeria. He holds PhD in Library and Information Studies from University of Botswana, Master of Library and Information Studies (MLIS), University of Ibadan, B.Sc Biology/Education, Obafemi Awolowo University, Nigeria. He has previously worked as Education Officer II with Civil Service Commission of Oyo State, and Business Development Manager with Nigerian Bottling Company, Plc. Bashorun, was PRO-Nigeria Library Association (NLA-Kwara State Chapter). Bashorun has published several research articles in refereed journals, book chapters and attended conferences/ workshops home and abroad.

Imelda Barong Edam-Agbor holds a B.sc/Ed in Business Education, MLS and Ph.D in Digital Librarianship. She is currently a Lecturer in the Department of Library and Information Science, University of Calabar, Calabar. She is a Chartered Librarian of Nigeria (CLN) and a member of the Nigerian Library Association (NLA). She has authored and coauthored books and articles in scholarly and professional journals. Her research interest has bias in user studies, reference service and library automation.

Olaronke O. Fagbola is a Lecturer in the Department of Library and Information Science, Faculty of Communication and Information Sciences, University of Ilorin. She holds a Ph.D in Library and Information Studies, University of Ibadan. Her research areas include Business Information Management, Knowledge Management, User studies and use of technologies in Libraries.

Ambrose E. Smart is a Librarian I with the National Open University of Nigeria, Abuja. A Certified Librarian (CLN) with a DLS; B.Sc and M.Sc degrees in Library and Information Science from Delta State University, Abraka, Delta State. His research interest covers Information Management and Services.

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

Shola Temitope Famuyiwa is a native of Abeokuta in Ogun state. Born and bred in Ibadan and llorin. Attended Solar nur/pri school Ilorin and Queen Elizabeth school llorin to obtain her first leaving school certificate and senior secondary school certificate respectively. Then she proceeded to Ekiti State University for her first degree where she got B.A Philosophy. She's currently running her master's degree at Babcock University, llishan Remo, Ogun state, Nigeria.

Theresa Osasu Makinde is an Assistant Librarian in Ambrose Alli University Library, Ekpoma Edo State, Nigeria. She is a member of the Nigerian Library Association (NLA). Mrs. Makinde, Theresa Osasu was born on the 7th February, 1978 in Lagos State. She attended Ansar-Ud-Deen Model College, Isolo, Lagos State from 1991-1996. She obtained her First degree, B.Sc – Agric/Fishery in 2004 from University of Benin, Ugbowo, Benin City, Nigeria and Master Degree in Library and Information Science (MLIS) from University of Agriculture, Makurdi, Benue State in 2017 and Postgraduate Diploma in Technology (PGDIT), Kano in 2006. She has published in both Local and International Journals. She has also attended several seminars, conferences and workshops in Library and Information Science. Area of interest is on Reference Resources and Services in Library.

Stephen Mutula is a seasoned professor and a prolific writer and works at the University of KwaZulu-Natal, college of humanities, school of the social sciences, department of information studies. He is currently one of the Deputy Vice Chancellors' in the University. His research interest is information society, information poverty, information ethics, digital exclusion, e-government, ICT4D, and information for development.

Rhodes Elias Mwageni (PhD) is a lecturer/librarian at Teofilo Kisanji University – Tanzania-East Africa. He completed his BA General (Hons) degree, Postgraduate Diploma in Education (PGDE), MA in Information Studies at University of Dar Es Salaam – Tanzania and PhD (Information studies) at the University of KwaZulu Natal, Pietermaritzburg-South Africa. His research interests embrace reading culture as an attitude and behaviour, education, marketing of information services, reference services, digital library services and extensive experiences of research supervision at undergraduate level.

Oluwatoyin Oyeyemi Obinyan (Mrs.) is a Chartered Librarian of Nigeria (CLN), serving as academic librarian with the Ambrose Alli University, Ekpoma, Edo State Nigeria. As an undergraduate at the University of Ibadan between 2002 and 2003, Mrs Obinyan while on Industrial Work Experience had a stint as Circulation Officer at the Second Division Commanding Officers' Library, Odogbo, Ibadan, Oyo State between 2002-2003 and later worked as Assistant Research Librarian in Development Policy Centre (DPC), Ibadan. Mrs Oluwatoyin Oyeyemi Obinyan is an alumna of the University of Ibadan, Ibadan, where she had her Diploma (DLS) in 2004 in Library Studies and BLIS degrees in 2008; and the Delta State University, Abraka, where she obtained her M.Sc in Library and Information Science in 2014. Since joining the Ambrose Alli University Library, Ekpoma, in 2016, Mrs Obinyan had worked in technical division of the University Library. She left the technical division of the library to serve of Acting Head of Readers Department before being deployed to head the Electronic Library Department as Electronic Resources Librarian for the University, she also teaches at undergraduate level. She is a member of Chartered Library and information professionals (CILIP) UK and Nigerian Institute of

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

Management (NIM). She has published in local and international journals. Her area of interest covers: Users Studies, Scholarly Communication, Application of ICTs, Human Resource Development and so on. She is having digital footprint on Google Scholar Citation; Twitter handle, Research gate, Linkedin, Academia, Facebook, Google+.

Wilson Chukwunedum Ochonogor is a lecturer at the Delta State University in the department of Library and Information Science. He is currently a Doctoral Student at the University of KwaZulu-Natal, South Africa. His research interests are: health information systems, health information seeking behaviour, ICTs interface in healthcare management, digital library management, and library management.

Roseline O. Ogundokun is an Assistant Lecturer in the Department of Computer Science, Landmark University, Omu Aran. Her area of research includes Information Security, Data Mining and Information Science. She holds Bachelor of Science in Management Information System from Covenant University, Ota; Master of Science in Computer Science from the University of Ilorin, Ilorin; Post Graduate Diploma in Education (PGDE) from the National Teachers' Institute (NTI), Kaduna and; currently a PhD student in the Department of Computer Science, University of Ilorin, Ilorin. She is a member of Nigeria Computer Society (NCS); Computer Professionals (Registration Council of Nigeria) (CPN) and Graduate Member of Nigeria Institute of Management (NIM). She is married.

Victoria Okojie is a Lecturer in the Department of Library and Information Science, University of Abuja, Nigeria and Member, IFLA Governing Board and Chair, IFLA Division V. Victoria has been working in the Library and Information sector for over 30years, with experience in both teaching and practice. She has worked in the University of Ibadan library; The Birtish Council Library; LARIS Department, University of Ibadan; as an independent consultant and as Registrar, Librarians'Registration Council of Nigeria. She currently lectures at the University of Abuja. She holds a Doctor of Philosophy degree (PhD) from the Ahmadu Bello University, Zaria, Nigeria. In furtherance of her interest in building strong library associations, she has held various positions such as President, Nigerian Library Association; Chair, IFLA Africa Section; and currently Chair, IFLA Division V. Her record of 'firsts'include: First Nigerian elected as member, IFLA Governing Board; first Nigerian Area Director of the British Council; first Nigerian appointed into the prestigious International Advisory Committee, UNESCO Memory of the World Programme and first Nigerian appointed as Adviser, Bill & Melinda Gates Foundation Global Libraries Programme. Victoria has also blazed the trail in many other sectors. Victoria is an Associate of the IFLA International Leaders Programme; Fellow, United States Department International Visitor Leadership Programme as well as Fellow, UNESCO Institute for Lifelong Learning. She has served on the Board of many organizations, including the National Library of Nigeria. Victoria has a strong passion in advocating for Library and Information Services issues, mentoring young librarians and promoting universal access to information.

Muhammed Jamiu Oladele was born Lagos on the 3rd of October 1975. He attended Ansar-U-Deen Primary School, Ijio, Oyo State. Iwajowa Community High School, Ijio, Oyo State. University of Ilorin, 1998-2002. After his National Youth Service, in Borno State, he worked at Federal Government Girls' College, Monguno, 2004-2007. As a full time Lecturer, he equally worked with Al-Ibadan College of Education, Boluwaji, Ibadan, Oyo State, 2009-2014. Part-time Lecturer, Gateway Polytechnic,

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

Saapade, Ogun State, 2014-2016. Assistant Lecturer, Department of Library and Information Science, University of Ilorin. Mr. Muhammed bagged his first degree in Economics Education in 2002, Master's degree in Economics of Education /Educational Management, University of Ibadan, in 2009. Another Master's degree in Library and Information Science, University of Ibadan, 2014. Presently, Mr. Muhammed is a PhD student in the Department of Library and Information Science, University of Ibadan. He has published in both local and international journals. He equally specializes in the following field of knowledge: Librarianship, Information Science, Education, Economics, Human and material Resource Management. He is happily married with Children.

Taylor Morenikeji Olayinka graduated from the University of Ilorin, Nigeria where She Studied Library and Information Science. She was supervised by Dr. Akinboro, E.O. She has bias in Social Media and Libraries.

Oso Oluwatoyin is an academic Librarian working with the Ajayi Crowther University Oyo, in Oyo State, Nigeria. She is a doctoral student in the Department of Library and Information Science at the University of Ilorin, Nigeria.

Babarotimi Opeyemi Oluwaseun is the Systems Librarian, National Open University of Nigeria, Abuja. He holds M.A. Information Science (University of South Africa); B.Tech Computer Science (Federal University of Technology, Akure). His research interest covers Knowledge Management, Information Science and Information Technology.

Kamal Tunde Omopupa holds BA (LS), MILR, MLIS and a Ph.D. from Bayero University, Kano, the University of Ilorin, the University of Ibadan Nigeria and the University of KwaZulu-Natal in South Africa respectively. He is presently a Senior Lecturer and Head of Dept. of Library and Information Science, University of Ilorin Nigeria. He is a Chartered Librarian, registered member of the Nigeria Library Association (NLA) and CILIP, UK. He specialises in health information, academic libraries and rural librarianship. He has experience in teaching and research in Librarianship.

Edeama O. Onwuchekwa is currently an Academic Librarian in the National Open University of Nigeria, Abuja on leave of absence. She holds a B.A (Hons) in Library and Information Science from the University of Nigeria, Nsukka and a master's degree in information studies from the University of Ghana, Legon. She is a member of the National Library Association of Nigeria and the African Council for Distance Education. Her areas of professional interest include Information Organisation and Retrieval, Disaster and Risk Management of Information Resources, Reference and Information Services, User Education, Information Literacy and Distance Education. Mrs Onwuchekwa is an adept researcher and has excellent interpersonal relationship with her reading clientele. She has a strong passion to revive the reading culture in children and youths in the developing countries. She is an ardent believer of the maxim that "Books are for Use". Outside of professional interests, she enjoys reading, writing and counselling. She also loves spending time with her husband and son. She bagged her Doctoral degree from the Department of Information Science, University of South Africa in 2017.

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

Colette Ogugua Onyebinama is presently working as a librarian 1 at the library (ICT Unit) Federal University of Technology, Owerri. She graduated from the University of Nigeria, Nsukka where she obtained a BA (Hons) in Lib.Sc/Engin 1999, a Master of Lib/Inf. Sci from Imo State University, Owerri, Nigeria. She is currently undertaking a PhD Programme at the NnamdiAzikiwe University, Awka in the same field. She is interested in writing in the following scientific fields: ICT, Institutional Repositories, Academic libraries, etc.

Faith Orim is a lecturer in the Department of Library and Information Science, University of Calabar Nigeria. Orim obtained her doctoral degree from the department where she teaches in the year 2016. Her research focus is in the area of Preservation and Conservation of Library Material.

Razaq Femi Quadri received his B.Ed, MLIS and PhD degrees from the University of Ibadan, Nigeria. He is a seasoned librarian and an accomplished scholar who has researched extensively into the changing roles of libraries in society. He is currently the Polytechnic Librarian of the Federal Polytechnic Offa, Kwara State, Nigeria and the Chairman of the Nigerian Library Association, Kwara State Chapter, Nigeria. He is happily married with kids.

Bamidele Sunday Segun has his education career in the field of Librarianship. He obtained Diploma, Bachelor and Master Degree all in Library and Information Science. He started his career as a library attendant. He has worked with the Kwara State Library Board, Nigeria and Kwara State Polytechnic Library. He is currently the College Librarian in Kwara State College of Education, Oro, Kwara State, Nigeria. He is also currently a Ph.D. Students in the Department of Library and Information Science, University of Ilorin, Nigeria.

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

Index

A

academic library 25-27, 29-31, 34-35, 37, 70, 72, 76, 78, 113, 115, 129, 135, 137, 147-149, 152, 154, 159, 221-223, 235, 264-266, 269, 339, 341, 376, 390, 393, 401
academic performance 30, 328, 332-333, 346, 350, 356-357, 359-367, 370, 401, 407, 414, 417-418
Artificial Intelligence 45-53, 56, 67, 324
attitude 17, 26, 28-32, 34-37, 44, 48, 102, 106, 341-343, 345, 359, 401-402
awareness 2, 4, 15, 25-30, 33, 35-36, 38, 92, 94, 114, 161, 186, 189, 210, 222, 226, 234, 238, 328, 333, 343-344, 350, 373, 376, 382, 384, 388, 391-392, 394, 398, 400-401, 405, 413

B

behavior 13, 44, 83, 162, 165, 168, 178-179, 284, 290, 338, 394

C

challenges 19, 25-28, 30-33, 35-39, 51-52, 70, 72, 77, 85, 87, 98, 100, 104, 113-115, 119, 126, 152, 160, 162, 172, 175-176, 178, 204, 208-209, 222-224, 226, 247-248, 253, 273-274, 279, 288-289, 303, 307, 317-318, 320, 325, 338, 343-344, 350, 364, 367, 377, 380, 382, 388, 395, 397, 400, 406, 416, 418, 426, 428
change management 160, 163, 174, 183
cloud 45-46, 58-63, 67, 79, 93-98, 100-104, 108-109, 112-126, 128-129, 134-145, 147-149, 152-155, 159, 216-217, 239, 242, 251, 357, 408
cloud computing 45-46, 59-63, 67, 93-97, 100-103, 108-109, 112-126, 128-129, 134-145, 147-149, 152-155, 159, 251
Cloud Librarianship 45, 58, 61, 67
collection development 36, 38, 54, 71-72, 94, 114, 149, 278, 283-284, 286, 288
Communication Tool 231-232, 235, 237
Community Clouds 134
computers 30-31, 44, 46, 48-52, 59, 71, 97, 113, 136, 140, 143, 189, 209, 211, 213, 215, 220, 225-226, 230, 240-241, 244, 246-247, 255, 260, 262, 268, 311, 318, 324, 329, 331, 341, 349, 351, 371, 374-375, 377, 385, 394, 396, 400

D

debate 2, 4, 33, 161, 215, 307-308, 320, 323, 327
devices 4, 25-39, 59, 62, 94, 98, 114, 116, 136, 138-139, 145, 159, 208-211, 213-214, 216-217, 219-226, 230, 233, 238-240, 242, 245-246, 250-256, 265, 299, 309, 311-312, 314, 316, 318-319, 322, 324, 327-329, 332, 335, 344-345, 371-372, 374-378, 394, 412
digital age 33, 36-37, 70-72, 77-79, 82-83, 85, 88-89, 92, 208, 239, 387
digital contents 32-33, 39, 44, 87, 375
digital device 35, 44, 140, 144, 148, 309
digital platform 98-99, 103, 109, 112, 313, 327
digital publishing 225, 278, 283, 307, 309, 311-312, 314, 316, 322-323, 325, 327
Digital transformation 103-104, 109, 112
digitization 72, 87, 238, 244, 255-256, 269-270, 396

E

e-books 38, 64, 87, 208, 213-218, 220, 224-225, 230, 287, 309, 312-314, 375, 377
emerging technologies 190, 240, 250, 259, 261, 324, 333, 373, 380, 392
entrepreneurship 63, 66, 258
e-readers 209, 212-220, 224-225, 230, 309, 312-313, 318, 351, 374
e-reading 220, 225, 230, 309, 312, 319, 324
experiences from Nigeria 208-209, 221, 226

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

G

gadgets 13, 209, 238, 240-241, 248, 250, 253-255, 320, 324, 329

H

Hybrid Clouds 134

I

ICT 2, 26-32, 35-37, 78, 82, 87-88, 93-94, 114, 138, 222, 226, 239, 279, 314, 319, 333, 349, 363, 370, 372-373, 380, 383, 395-398, 400, 413
inclusive engagement 1, 10-11, 19-20, 24
information and communication technology 36, 94, 186, 385, 395
information communication 71, 129, 154, 382-383, 387, 395, 399
information dissemination 70-71, 75-76, 78, 88, 92, 113, 185-186, 188-189, 201, 204, 225, 239, 374, 382-383, 392-393
Information Graphics 231, 237
information resources 33, 36, 52, 58, 61, 70-74, 77, 88, 114, 135, 137, 159, 204, 233, 271, 328-329, 332, 337-338, 341-342, 349, 351, 374, 384-385, 405, 415
information sharing 82, 84, 87-88, 167, 297, 299, 303-305, 377, 382, 388, 393, 410, 414
inforpreneurship 66

L

leadership 160-161, 163-165, 169, 171, 173-179, 183, 192, 358, 396
learning management system 160-161, 165, 167, 171, 179, 183-184
librarians 1-4, 10-13, 17-18, 20, 24, 26, 28, 31-34, 36-39, 44, 58, 62, 76, 80-81, 84-85, 87, 93, 95, 101-102, 105, 129, 140, 152, 154, 159, 173-174, 185-186, 188-189, 194-195, 197-198, 202, 210-211, 221-224, 226, 232, 235-236, 239-240, 243, 247-248, 250-251, 253-256, 265, 269, 273, 283-284, 286, 288-289, 292-293, 318, 324, 333, 339-342, 350-351, 366-367, 371-372, 376, 379-380, 382, 388, 390-402
library 1-5, 10, 13, 16-18, 25-39, 44-46, 52-58, 61-64, 67, 70-78, 80-89, 92-95, 98-102, 104-105, 107-109, 112-115, 119-121, 123-126, 129, 135-139, 144, 147-149, 152, 154-155, 159, 163, 167-170, 172, 174, 185-190, 192-198, 200-204, 208-214, 216-219, 221-227, 231-240, 243-256, 258-266, 269-274, 278, 283-284, 286-289, 292-293, 295, 299, 318-319, 324, 328-329, 332-335, 337-344, 349-352, 367, 371-380, 382-386, 388-402, 405, 408, 415, 421
Library and Information Science 45, 52, 55, 62-64, 67, 93, 112, 187, 239, 243, 288, 299, 372, 397, 400, 421
library applications 222-223, 252
library consortia 71, 73, 92
library consortium 74-75, 83, 86, 92
library cooperation 71-76, 92
Library Management Systems 112
Library Service Platform 112
library services 1, 10, 35, 37-39, 46, 56, 67, 80, 85, 92-94, 105, 112-115, 119, 125-126, 129, 135-137, 185-186, 190, 194, 204, 209-211, 221-223, 226-227, 232, 238-239, 256, 269, 324, 332-333, 337-343, 351-352, 371-373, 375-376, 378, 382-383, 388-389, 391-395, 399-400, 402, 405
library services platform 112
Library Signage 231-232, 235, 237
library users 25-39, 54, 62, 136, 185-186, 189, 194-197, 201, 210-211, 221-224, 227, 231-233, 235-237, 248, 252, 255, 258-259, 262, 265, 271, 273-274, 286, 319, 328-329, 337-342, 351-352, 373, 379, 382-383, 390-391, 398, 405

M

machinization 46
makerspace 258-267, 269-270, 273-274
Management of HIV 1, 24
marketing library products and services 25-38
marketing mix 105-106, 108-109, 112
media 1-5, 10, 13-20, 24, 29, 32, 39, 79-80, 99, 102, 171, 186, 190, 192-193, 196, 201, 213, 216-218, 223-224, 231, 234, 236, 239, 242-245, 247, 251, 255, 260-261, 271, 283, 297-299, 301-305, 308-309, 316, 322-324, 327, 331, 334-337, 341, 350-352, 355-360, 362-367, 370, 382-385, 388, 390-394, 400-401, 406-419, 421, 423-428, 436
medical librarians 1, 13, 20, 24, 392
mobile devices 4, 94, 208-211, 213, 219, 221-226, 230, 239, 242, 245-246, 299, 312, 314, 318, 322, 324, 328, 335, 371-372, 374-378
mobile library services 373
mobile technology 36, 210-211, 219, 221-223, 242, 335, 371-378, 380, 436
Moodle 160-180, 183-184

Adeyinka Tella (tellayinkaedu@yahoo.com)
IGI Global Platform
Downloaded: 8/5/2019 11:58:20 AM
IP Address: 197.211.32.243

N

National Open University of Nigeria 135, 137, 154, 159
new opportunities 278, 295, 308, 313, 388, 411
new tools 238, 248, 250, 253-255
Nigeria 1, 3-5, 10, 14-17, 20, 70-72, 76-77, 83, 85, 88-89, 113-119, 126, 128-129, 135, 137-138, 154-155, 159, 208-209, 221-223, 225-226, 269, 299, 313, 320-321, 325, 338, 340-342, 344, 357, 360, 362-363, 365-367, 394-397, 400-402, 408, 413-414, 416-417

O

online learning 160-162, 183, 303, 351, 356, 413-414, 417
open access 73, 99, 238, 278-286, 288-290, 292-293, 295
Open Collection 296
Open Content 278-279, 281, 296
opportunities 3, 24-25, 27, 30-31, 35-37, 45-46, 55, 67, 71, 98, 102, 104, 135, 137, 153-154, 164, 167, 176, 194, 208-209, 219, 222, 226, 239, 252, 269-270, 273, 278, 288-289, 295, 304, 308, 313, 318, 325-326, 336, 372, 377, 382-383, 388, 396, 400, 408, 411, 413-414

P

perception 37, 44, 49-50, 162, 171, 254, 260, 270, 318, 338, 341, 383-384, 401-402
Prints 102, 255, 327, 386
private clouds 134, 143
professional development 77, 161, 172, 180, 183, 394
provider 17, 60-61, 94, 97, 101, 114, 118, 120, 134, 139, 141, 384
public clouds 120, 134, 143
publishing 53, 78, 81, 192, 225, 247, 252, 278-284, 289-293, 307-312, 314-317, 320-327, 396, 399, 413

R

resource sharing 70-85, 88-89, 92, 94, 119, 137, 139-140, 147-148, 152, 154, 238

S

school administrators 160, 167, 169-170, 172, 174-176, 184, 362
SKILLS REQUIRED 371, 395
Smart Phones Usage 344, 349
Smartphone Impact 349
smartphones 24, 63, 104, 136, 201, 209, 211, 214-215, 222, 230, 245-246, 249, 256, 328-337, 344-346, 349, 372, 374
social media 1-5, 10, 13-20, 24, 29, 32, 79-80, 102, 193, 213, 223, 239, 245, 251, 255, 297-299, 301-305, 316, 322, 327, 334-337, 350-352, 355-360, 362-367, 370, 383, 391, 400-401, 406-419, 421, 423-428, 436
social media usage 350-351, 363, 365, 367, 370, 406-409, 417, 419, 421, 423-424, 428
social networking 2-3, 14-15, 17, 79, 82, 118, 124, 129, 139, 154, 219, 245, 298, 304, 334-335, 351, 356-360, 362, 364-366, 382-384, 388-390, 392-394, 401, 405, 407, 410-418, 427, 436
social networking sites 2, 14, 298, 304, 351, 356-360, 364-366, 383, 388-390, 392, 401, 405, 407, 410-418, 427, 436

T

teachers 57, 160-173, 175-176, 178-180, 183-184, 220, 263, 272, 313, 319, 336, 356-357, 361-362, 366, 370, 384, 408, 413
tweets 252, 412, 436

U

undergraduates 297-299, 303, 328-329, 342-344, 346, 349-350, 355-357, 359, 363, 365-367, 370, 406-407, 414, 417, 419, 422-423, 427-428
universities 26, 30-31, 36, 76-77, 88, 100, 113, 119, 136-137, 154, 174, 201, 222-223, 240, 258-259, 269, 280, 284-285, 287, 298-299, 336, 343, 350, 352, 356-357, 363, 365-366, 390-391, 396-397, 401-402, 407
utilization 25-31, 34, 36-37, 39, 62, 101, 108, 116, 138, 152, 208, 221, 328, 334, 342-344, 350, 355, 365, 367, 380, 382, 384, 392-393, 400-401, 405

W

Web 2.0 4, 29, 79, 138, 169, 186, 219, 240, 298, 332, 363, 373, 382-384, 388-395, 400-402, 405, 410-411, 416