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FACTORS INFLUENCING THE ADOPTION OF BIG DATA FOR SCHOLARLYCOMMUNICATION BY LIBRARIANS IN UNIVERSITIES IN SOUTHWEST, NIGERIA

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Abstract

Big data plays a crucial role in transforming academic libraries' functions in research support and scholarly communication. Thus, librarians are increasingly harnessing big data resources and adapting their skills and strategies to leverage this resource effectively, in order to meet the evolving needs of researchers and the academic community. The study examined the adoption of big data for scholarly communication among librarians in Southwest, Nigeria. The findings provided insights into the factors driving the adoption of big data by librarians and the challenges librarians face in adopting these resources into their professional activities. The study adopts a descriptive survey design. The population includes three hundred and sixty-eight (368) librarians working across the six universities in Southwest, Nigeria. The study employed a total enumeration method while a questionnaire was used to obtain data from respondents. 257 copies of the questionnaire were completed and found useful for analysis. Data was analyzed using descriptive statistics, mean and standard deviation. The findings revealed that various big data resources, including digital repositories, web data, science databases, and social media data, were available for scholarly communication to librarians. Also, challenges such as time consumption and limited resources were identified. Factors influencing the adoption of big data included training availability, institutional support, technical skills, perceived usefulness, and time constraints. The study recommends continuous training and professional development programs to improve librarians' technical competencies and big data resources, and enhance their research productivity

Keywords: Big data, Data librarian, Scholarly communication, Librarians, University libraries, Nigeria

INTRODUCTION

Around the globe, the introduction of big data has revolutionized how information is managed across different sectors. In the context of scholarly communication, big data holds significant potential for enabling researchers, educators, librarians and students to harness vast amounts of information for knowledge creation and dissemination. Librarians are therefore, considered important in the process of utilizing big data for scholarly communication because they play a crucial role in facilitating the utilization and management of big data. Scholarly communication involves the publication of research findings in journals, books, and other academic platforms (Huang et al., 2021). Scholarly communication refers to the process by which researchers and scholars create, share, and disseminate knowledge. Tella (2023) describes scholarly communication as an ongoing, evolving process involving the creation, exchange, dissemination, and preservation of knowledge. This process aims to enhance the influence of academic research on teaching, policymaking, and real-world practices. It also fosters collaboration both within academic circles and in broader communities, ensuring that scholarly work has societal as well as intellectual impact. Adetunji (2023) and Miller, Roberts, and Kim (2021) identified activities such as conference paper presentation and participation in academic discussions as vital aspects of scholarly communication**.**

The use of big data has become increasingly significant in the realm of scholarly communication. This is particularly true among librarians because they serve as powerful tools for analyzing information resources usage patterns and enhancing service delivery (Lee, 2020). Scholarly communication involves the dissemination of research outputs through institutional repositories and digital platforms (Adeyemi & Ojo, 2022). These repositories consist of large amounts of data that are in different formats, commonly referred to as big data. Big data in libraries describes the collection and analysis of limitless amounts of information generated through user interactions, digital resource access, and library operations. Big data, as described by Okike and Ogbomo (2023), comprises a large and complex mix of organized and unorganized information that is produced through library activities, user actions, and the use of digital materials. Tella (2019) refers to big data as a set of large and complex data sets that necessitate the use of advanced analytical techniques for effective interpretation and processing of information. These data are used to improve library services and make operations more efficient through the help of advanced analytical tools such as Apache Spark**,** Python with Libraries and Google BigQuery. Big data helps librarians understand user preferences, improve service delivery, and make data-driven decisions. For instance, usage patterns from e-books, databases, and catalog searches can inform acquisition strategies and resource allocation. Big data is characterized by vast volumes of information that require sophisticated analytical tools and methodologies to process, analyze, and derive meaningful insights, particularly in understanding complex phenomena and behaviors (Aina & Omotayo, 2023). By leveraging big data analytics, librarians can gain insights into trends in scholarly literature. Moreover, big data provides access to relevant resources, sharing of data sets and support for research activities.

The process of scholarly communication is crucial for enhancing the impact and accessibility of academic research outputs and facilitating academic and research networks. These networks can take the form of online forums and discussion groups, professional associations, and social media platforms dedicated to academic discourse. Smith (2020) emphasizes that the sharing of data sets and engaging in collaborative research efforts are key elements of scholarly communication. Eze and Nwafor (2023) also support that academic networking and collaborative projects are significant in advancing scholarly communication. Collaborative projects involve joint research efforts between individuals or institutions, which can lead to insightful and impactful studies.

Several factors have been found to facilitate engagement in scholarly communications. Workshops and training are one of the key factors (Adams & Brown, 2022; Aina & Omotayo, 2023). Workshops and training provide researchers with the skills and knowledge needed to navigate the complexities of academic publishing, data management, and communication strategies. Adams and Brown (2022) note that librarians organize workshops and training sessions to educate researchers on best practices in the management of data and publishing. The training sessions frequently address subjects like academic journal writing, leveraging digital research tools, and comprehending open access publishing. Attending these workshops will enable librarians and other researchers to enhance their skills in reporting their research findings and making meaningful contributions to their disciplines. The advancement of digital technologies has greatly streamlined and democratized the process of scholarly communication.

For librarians, facilitating scholarly communication is a critical aspect of their role in academic institutions. Moreover, librarians use scholarly communication to engage with the academic community and foster collaboration by guiding on copyright issues, helping researchers navigate the complex legal landscape surrounding intellectual property and open access publishing (Garcia, Thompson, & Lee, 2022). They also play a key role in the orientation and promotion of open access initiatives, which aim to make scholarly research freely available to everyone, thereby democratizing access to knowledge in African academic institutions (Nguyen, 2022; Eze & Nwafor, 2023). Librarians are therefore, tapping into the vast potential of big data to amplify their impact on research endeavors, providing scholars with advanced tools and expertise to uncover fresh perspectives and drive innovation.

The incorporation of big data into scholarly communication practices offers avenues for innovation within academic libraries. According to Adefila et al. (2024), adopting big data analytics helps librarians manage resources better, provide services more efficiently, and keep users more engaged. However, some factors have been identified to influence the adoption of big data for processes such as scholarly communications. Some of these factors include data privacy, security, and supporting infrastructure (Eze and Nwankwo, 2024). Afolabi and Ogunyemi (2023) opine that the effective use of big data necessitates a robust infrastructure and specialized skills, which pose challenges for many libraries, especially those in developing countries. Adamu et al. (2023) highlight limited funding and training as significant barriers to the widespread adoption

of big data in African libraries. Since academia's foundation is built on the pillars of scholarly communication, librarians play a vital role as catalysts, connecting researchers, facilitating knowledge sharing, and empowering the academic community to advance.

Therefore, examining the availability of big data resources and factors that influence their adoption for scholarly communication is pivotal for harnessing the benefits and addressing associated challenges. Garcia et al. (2022) noted that the role of librarians is evolving to encompass not only the curation and management of large datasets but also the development of advanced analytical skills to interpret and leverage this data effectively. This shift is crucial as libraries increasingly engage with big data to support research activities and enhance scholarly communication. These skills include understanding data trends, identifying patterns, and providing insights that can inform research strategies. By leveraging big data, librarians can improve resource allocation, optimize research support services, and facilitate more effective communication and collaboration among scholars.

Despite the growing recognition of big data's transformative potential, many Nigerian libraries often encounter challenges related to data infrastructure, access, and professional expertise. According to Nakaziba and Ngulube (2024), the digital transformation of libraries in Africa is often hindered by inadequate technological infrastructure and limited access to essential data resources. This insufficiency not only hampers the ability of librarians to fully leverage big data but also impacts the overall quality of scholarly communication. Moreover, Akinyemi and Adewale (2023) pointed out that the availability of big data in Nigerian libraries is inconsistent, further complicating efforts to adopt data-driven approaches in library operations and research support. Many librarians in Nigeria recognize the potential benefits of big data in enhancing research capabilities and service delivery (Afolabi & Okafor, 2023) but do not effectively harness big data. However, without a comprehensive understanding of the availability of big data, efforts to improve scholarly communication among librarians in Southwest Nigeria may remain fragmented and ineffective. This research is therefore aimed at examining the factors that influence the adoption of big data for scholarly communication among librarians.

OBJECTIVES OF THE STUDY

The main objective of the study is to examine the factors influencing adoption of big data for scholarly communication among librarians in universities in Southwest Nigeria. Specifically, the study sought to:

1. Determine the big data resources available for scholarly communications among librarians;
2. Identify factors influencing the adoption of big data in facilitating scholarly communication among librarians; and
3. Identify the challenges with the adoption of big data for scholarly communication among librarians in universities in Southwest Nigeria.

RESEARCH QUESTIONS

1. What are the big data resources available for scholarly communications among librarians?
2. What are the factors that influence the adoption of big data for scholarly communication among librarians?
3. What are the challenges with the adoption of big data for scholarly communication among librarians in universities Southwest Nigeria?

LITERATURE REVIEW

Big data has become ubiquitous in libraries and various information institutions, as organizations are increasingly integrating them into their daily practices. Big data often refers to enormous data sets with rapid expansion in multiple file formats requiring sophisticated data handling techniques (Zhan & Widen 2019). Chen and Zhang (2022) also defined big data as the vast amount of data generated every second from various sources requiring advanced computational techniques to analyze and derive meaningful insights. Big data possesses some major qualities, which include volume, velocity, variety, value, and veracity (Gartner, 2018; Carter & Jackson, 2022). Although patrons are not formally requesting big data services, many libraries have been utilizing big data to enhance operations, often without full awareness. Large libraries manage an overwhelming amount of data. Tella (2021) describes large public libraries as having almost unmanageable amounts of data due to digitized local collections, including metrics such as page visits, downloads, and hits. The overwhelming volume of digital interactions within the library requires advanced data management solutions to handle the influx of metrics and ensure the effective use of information. Thus, the integration of big data technologies in libraries is enabling librarians to enhance their services, streamline operations, and foster a more dynamic and responsive academic environment.

Volume, which is a basic feature of big data, refers to the magnitude of a data collection measured in terabytes and petabytes. Roberto and Salvatore (2024) highlight the importance of value and veracity, indicating that the true potential of big data lies in its ability to provide valuable insights. For librarians to be able to make informed decisions relating to scholarly communication, it is imperative that the veracity of big data resources is ensured. This is supported by Chen et al. (2024), who state that ensuring the veracity of big data is essential for organizations to make well-informed and effective decisions. Analyzing and managing big data would often require advanced and digital technologies, necessitating the development of technical solutions. Moreover, Agrawal and Nyamful (2022) noted that traditional storage systems are often inadequate for the massive data sets generated in contemporary environments. This is particularly true of big data resources. The significant impact of big data is therefore considered essential, as well as recognizing both its transformative potential and the challenges it poses.

Thus, effective management and analysis of big data require advanced technologies, robust infrastructure, and skilled professionals to harness its full potential. Olawale (2022) underscores

the critical importance of data privacy and security in Africa, stressing the need for robust policies and frameworks to address these concerns effectively. Also, Akinyemi and Adewale (2023) emphasize that in the African context, data privacy and security are paramount concerns that need to be addressed through comprehensive policies and frameworks. Furthermore, Eze and Nwankwo (2024) underscore the importance of data privacy and security, emphasizing the need for policies that protect user information while enabling innovation. Today, it is a necessity to have robust policies that safeguard user information while still fostering an environment conducive to innovation. Ndemo and Mkalama (2023) highlight that the successful integration of big data in Africa depends on the establishment of strong data governance structures and the development of local expertise in data analytics.

As libraries increasingly rely on data for decision-making, research support, and digital services, the role of data librarians is becoming more indispensable. Data librarians are tasked with activities such as collecting, processing, analyzing, communicating, and preserving data. According to Federer (2018), the integration of big data into library services demands librarians who are proficient in data management and analytics to effectively support research and scholarly communication. Chen and Liu (2021) also emphasize that data librarians play a crucial role in bridging the gap between raw data and meaningful insights by applying their expertise in data curation and analysis. The integration of big data analytics allows librarians to identify trends in research.

Scholarly communication is progressively changing with the introduction of new technologies, leading to increased emphasis on open access and data sharing. Researchers and librarians are key players in this system, contributing to the dissemination and accessibility of scholarly work (Brown et al., 2023). Scholarly communication encompasses the processes through which research findings are created, disseminated, and preserved. It is a multifaceted process encompassing the creation, dissemination, and preservation of research findings. This process includes traditional publishing, digital repositories, and open access initiatives (Jain, 2018). It serves as the foundation for academic dialogue and the advancement of knowledge within various disciplines. The traditional model of scholarly communication involved printed journals and books as primary vehicles for the dissemination of research. However, the advent of digital technologies has significantly transformed this model, leading to dynamic ways of communicating knowledge. By leveraging digital tools and platforms, scholars can easily share data, co-author papers, and engage in virtual conferences, thereby enriching the academic dialogue and fostering a more interconnected research community. The transformation of scholarly communication through digital technologies has enhanced the creation, dissemination, and preservation of research findings. These advancements have made scholarly content more accessible to a broader audience, elevated the visibility of research from historically underrepresented regions, and promoted enhanced collaboration among scholars.

The availability of big data resources is essential for librarians in leveraging their benefits. Smith (2020) indicates that many libraries are increasingly adopting big data technologies and tools,

although the extent varies widely. Libraries are allocating resources towards infrastructure, including data storage systems and analytics tools, to bolster their big data efforts. Moreover, Lee, Kim, and Park (2023) assert that collaborations with academic institutions and tech companies are becoming more common, providing librarians with access to advanced big data resources. In the modern landscape of information science, the availability of big data resources for librarians has grown exponentially, influenced by technological advancements and the digital transformation of library services (Smith, 2020). This exponential growth has empowered librarians to harness vast amounts of data for enhanced decision-making and service delivery. As Kwarteng (2022) notes, the integration of big data tools in libraries has revolutionized traditional cataloging, allowing for more dynamic and user-focused services. Adeyemi (2023) supports this by stating that the adoption of big data analytics has enabled libraries to identify patterns in user behavior, optimize resource allocation, and predict future trends in information consumption.

The availability of big data resources is critical for supporting scholarly communication activities among librarians. Big data resources encompass various types, including structured data, unstructured data, and semi-structured data. Structured data, typically found in databases, is organized and easily searchable. Unstructured data, such as text documents, social media posts, and multimedia content, lacks a predefined structure, making it more challenging to analyze. Semi-structured data, like XML or JSON files, contains tags and markers to separate data elements but does not adhere to a strict schema (Kumar & Singh, 2020). These varied forms of big data resources require different analytical approaches and tools that necessitate training for effective utilization.

Bibliographic databases, government databases, and social media platforms, and Library management systems (LMSs) are some of the sources of big data. Modern LMSs are designed to handle extensive data generated from various library operations, including cataloging, circulation, user interactions, and resource management. According to Li and Ye (2020), the integration of big data analytics in LMS has enhanced the ability of libraries to manage and analyze large datasets effectively. This integration enables librarians to gain insights into user behaviors, resource usage patterns, and operational efficiencies, thereby improving service delivery and decision-making processes. Indeed, the integration of LMS with big data capabilities presents both opportunities and challenges. While it can enhance the effectiveness of academic programs, it also raises concerns regarding data privacy, security, and the need for skilled personnel to manage and analyze the data effectively. Jibril (2022) therefore cautions that it is crucial to address the challenges associated with big data utilization to ensure effective and ethical usage. Implementing these advanced systems demands considerable financial investment in both technology infrastructure and the training of library staff.

Bibliographic databases are essential for scholarly communication, providing access to a wealth of information about academic publications across various disciplines. According to Tella and Akindele (2021), these data repositories collect, preserve, and disseminate the intellectual output

of an institution, including theses, dissertations, research articles, and datasets. Smith (2020) asserts that databases, such as Scopus, Web of Science, and PubMed, offer structured data that librarians can leverage for research and analysis. By utilizing bibliographic databases, librarians can support academic research, track publication trends, and facilitate literature reviews, thus contributing to the advancement of knowledge and scholarly communication. Okoro (2023) reinforces this point, stating that bibliographic databases are crucial for maintaining the integrity and comprehensiveness of academic literature reviews.

Despite the enormous benefits, there still exist challenges associated with the adoption and utilization of big data among librarians, particularly in developing regions of the world. These challenges include issues such as data privacy and security, policies, ethical considerations, and inadequate training and funding. Nwosu (2022) argues that the high subscription costs of some bibliographic databases limit their accessibility, particularly for institutions in developing countries. Adetunji's (2023) study identified issues related to user privacy, policies, and data security to maintain trust and comply with legal standards. Chidi (2023) also notes that institutional repositories effectiveness is often limited by the absence of standardized metadata, which complicates the organization and retrieval of information. Adebayo (2024) also reported that high costs associated with journal subscriptions, which can serve as a limitation to accessing required information, as another challenge with big data adoption, particularly for researchers in developing regions.

Funding constraints also hinder the effective utilization of big data for scholarly communication among librarians in Africa. Securing financial resources for big data projects is challenging due to competing priorities and limited budgets within academic institutions. Abdul-Rahman (2021) notes that many universities face budgetary constraints, making it difficult to allocate sufficient funds for big data initiatives. Chukwuma (2022) elaborates that the limited financial resources available are often directed towards more immediate needs, leaving little room for investment in big data technologies. This prioritization impacts the ability of institutions to support long-term big data projects. These financial challenges are both internal and external (Kalu, 2020). Dependence on external funding sources, such as government grants and international aid, often leads to inconsistent support for big data initiatives. Consequently, many university libraries are unable to invest in the necessary infrastructure, training, and support systems required to help librarians harness the potential of big data for enhancing scholarly communication.

METHODOLOGY

The study adopted a descriptive survey design to examine the adoption of big data for scholarly communication among librarians in universities in Southwest Nigeria. The study comprised all professional librarians in university libraries across the Southwest region of Nigeria. The population included three hundred and sixty-eight (368) librarians working in the thirty-eight (38) universities across the six Southwest states. These include six (6) federal Universities, eight (8) state-owned universities, and twenty-four (24) private universities in Ekiti, Lagos, Ogun, Ondo, Osun, and Oyo States. The study participants are librarians who are involved in various

aspects of scholarly communication, including collection development, research support services, and user engagement. This study adopted the total enumeration sampling, also known as census, involving examining every member of the population. This type of sampling is a non-probability sampling technique in which every member of the population is included in the study, and it is commonly used when the population size is relatively small and accessible (Creswell & Creswell, 2018; Saunders et al., 2019). The method is comprehensive in that it ensures that no individual is left out of the study. The instrument used for data collection was a questionnaire. Validity and reliability of the instrument were ensured. For the reliability of questionnaire items, Cronbach's alpha value ranges from 0.88 to 0.93. Two hundred and fifty-seven (257) copies of the questionnaire were completed and found useful for analysis. Data was analyzed using descriptive statistics, mean, and standard deviation.

RESULTS AND DISCUSSION OF FINDINGS

The presentation of results and discussion is based on the research questions as shown in Tables 1, 2, and 3.

Research Question 1 sought to answer the following research question: What are the big data resources available for scholarly communications among librarians? The responses to this question are summarized in Table 1 below.

Table 1: Big Data Resources Available for Scholarly Communication among Librarians

Big data		N	M	S.D	Remark
Science databases		257	2.92	0.83	Available
Social media data		257	2.99	0.97	Available
Digital repositories		257	3.20	0.53	Available
Web data		257	3.20	1.04	Available
Sensor data		257	2.59	0.73	Available
Government data		257	3.11	0.98	Available
Commercial data		257	2.88	0.87	Available
Cloud-based data		257	2.85	1.02	Available
Machine generated data		257	2.98	0.85	Available
Transactional data		257	2.89	0.95	Available
Cumulative Mean			3.0	0.62	Available

Key: 1 = N- Number of respondents, Mean -M, S.D- Standard deviation

The results in Table 1 show the big data resources that are available for scholarly communication among librarians in southwestern region of Nigeria. The results revealed that digital repositories and web data were the most available big data resources, each recording a mean value of x = 3.20**,** indicating a high level of availability of these big data resources in the surveyed universities. The cumulative mean of 3.00 indicates moderate availability across the types of big data resources. The cumulative mean of 3.00 further suggests that the availability of big data

resources to librarians is between moderate and high, and this is essential for supporting scholarly communication. Other available big data resources include government data (x = 3.11), social media data (x = 2.99), and machine-generated data (x = 2.98); science databases (M = 2.92); transactional data (M = 2.89); commercial data (M = 2.88); cloud-based data (M = 2.85); and sensor data (M = 2.59). These results indicate that all the big data resources identified were available for scholarly communication to the librarians that participated in the study.

The findings on moderate to high availability of the different big data resources align with Thanuskodi (2023), who emphasized librarians' growing engagement with different big data resources to support their research activities. More specifically, the findings revealed high availability of big data resources such as digital repositories and web data for scholarly communication by librarians in universities in Southwest Nigeria. This indicates that university libraries in Nigeria are making significant strides in providing access to big data resources, including digital repositories and web data. Digital repositories, which house theses, dissertations, institutional publications, and research outputs, are widely acknowledged as critical for scholarly communication. Their high availability aligns with recent trends in open access policies and mandates from funding agencies and academic institutions (Bozic & Vranes, 2021). Adebayo (2024) also supports this view, stating that digital repositories significantly enhance the visibility and impact of academic research by providing open access to scholarly outputs. This corroborates the findings of Tella (2021) and Oyadapo and Idowu (2022) and aligns with the report of Ogunleye (2018), which emphasizes the efforts of Nigerian university libraries in providing digital library services, including digital repositories. The high availability of digital repositories and web data, as perceived by librarians in the Southwest region, stresses the growing commitment of the libraries to enhancing access to scholarly resources. However, the findings on the lower availability of other big data sources such as transactional data, commercial data, and sensor data suggest that they may remain underutilized due to limited infrastructural and technical capacity or limited awareness among librarians.

Research Question 2 sought to determine: What are the factors that influence the adoption of big data for scholarly communication among librarians? The responses to this question are summarized in Table 2 below.

Table 2: Factors Influencing the Adoption of Big Data by Librarians

Factors	N	M	S.D	Remark
Perceived Usefulness	*257*	3.11	0.60	Agreed
Technical skills	257	3.12	0.88	Agreed
Institutional Support	257	3.17	0.74	Agreed
Training availability	257	3.24	0.67	Agreed
Time constraints	257	2.86	0.86	Agreed
Cumulative mean		3.01	0.57	Agreed

Key: 1 = N- Number of respondents, Mean -M, S.D- Standard deviation
Source: Field data (2024)

Results in Table 2 show that all the listed factors had a mean score above the benchmark of 2.50, indicating a general agreement among the respondents. It can be deduced from the results that the majority of the librarians agreed that all the factors stated truly influence librarians' adoption of big data for scholarly communication. Training availability had the highest mean score (M = 3.24), suggesting that access to training opportunities is the most influential factor in the adoption of big data. This is closely followed by institutional support (M = 3.17), technical skills (M = 3.12), and perceived usefulness (M = 3.11) which implies that organizational support, training, and usefulness are critical to successful adoption of big data by librarians. Although time constraints had the lowest mean score (M = 2.86), it still met the threshold for agreement, indicating that time remains a moderate but relevant factor in determining the adoption of big data by librarians. The cumulative mean of 3.01 suggests that, overall, librarians agree that these factors collectively influence the adoption of big data for scholarly communication.

The findings of the study indicate a moderate to high level of agreement of the librarians with statements on factors that influence their decision to use big data resources for scholarly communication. The results indicate that training availability has a high tendency to influence librarians' decision to adopt big data for scholarly communication. This aligns with Lee and Patel's (2023) opinion that continuous professional development and training programs are essential to equip librarians with the necessary competencies. Targeted training programs are crucial for enhancing data literacy and the practical application of big data tools in library settings. Such programs ensure that librarians can keep up with the evolving demands of their roles and leverage big data effectively to improve library services. Nwachukwu and Emeka (2024) also stress the role of professional development and structured training as a foundation for effective big data adoption. Libraries that invest in staff training see faster and more sustainable adoption outcomes. This implies that librarians, especially those in Southwest Nigeria, need continuous professional training in order to equip them with the necessary competencies.

In line with the findings on institutional support as a key factor that influences adoption of big data among librarians, Okonkwo and Salami (2021) reported that institutional support, including funding, leadership commitment, and policy frameworks, has a direct influence on the adoption of innovative data systems such as big data in libraries. Institutional support will foster the adoption and utilization of big data by librarians. The study also pointed out perceived usefulness as a necessary factor to be considered for the adoption of big data in libraries. Adeleke and Jimoh (2022) emphasize that the perception of usefulness plays a central role in librarians' willingness to adopt big data technologies. When librarians believe that big data can improve research quality, user services, and resource management, they are more inclined to adopt such innovations. The study further identified time constraints as a relevant factor that determines the adoption of big data by librarians. This substantiates the report of Jackson and Miller (2024) that time constraints, especially where there are routine duties, limit librarians' ability to explore and integrate new technologies such as big data analytics. The rate of adoption of big data by librarians could be reduced when adequate time is not dedicated for its use.

Research Question 3 sought to address the following question: What are the challenges with the adoption of big data for scholarly communication among librarians? The responses to this question are summarized in Table 3 below.

Table 3: Challenges Faced by the Librarians in the Adoption of Big Data

Challenges	N	M	S.D.	Remarks
Insufficient training and skills in utilizing big data tools	257	2.71	0.98	Agreed
High costs associated with acquiring and maintaining big data resources	257	3.11	0.80	Agreed
Lack of institutional support for integrating big data into library services	257	2.90	0.93	Agreed
Concerns about data privacy and confidentiality	257	2.85	0.98	Agreed
Complexity in managing and analyzing large datasets effectively	257	2.84	0.71	Agreed
Resistance to change among library staff towards adopting big data technologies	257	3.11	0.88	Agreed
Cumulative mean		2.92	0.58	Agreed

Source: Field data (2024) Key: = N- Number of respondents, Mean -M, S.D- Standard deviation

The results in Table 3 reveal the challenges with the adoption of big data for scholarly communication among librarians. The results indicate that the majority of the librarians that participated in the survey agreed with the statements provided on the challenges of big data adoption. Likewise, the cumulative mean of 2.92 is greater than the benchmark of 2.50. Hence, high costs associated with acquiring and maintaining big data resources and resistance to change among library staff towards adopting big data technologies (M = 3.11); difficulty in interpreting and applying big data insights to scholarly activities (M = 3.05); inadequate infrastructure to support big data initiatives in the library (M = 3.02); lack of institutional support for integrating big data into library services (M = 2.90); concern about data piracy and confidentiality (M = 2.85); complexity in managing and analyzing large datasets effectively and challenges in integrating big data with existing library systems and workflows (M = 2.84); limited access to comprehensive big data resources (M = 2.77) and insufficient training and skills in utilizing big data tools (M = 2.71); are the challenges faced by the librarians in adopting big data for scholarly communication. The findings of the study indicate that respondents generally agreed on these issues as barriers to big data adoption.

The findings revealed that high costs and resistance to change were the top challenges, indicating that financial constraints and human factors significantly hinder librarians' adoption of big data for scholarly communication. This finding aligns with Afolayan and Kareem (2021), who reported that limited financial resources, especially in public and smaller private universities, often prevent investment in the necessary infrastructure for big data projects. In the same vein, Dunmade and Hamzat (2022) noted that specific university libraries in Nigeria encounter financial constraints when it comes to adopting big data resources. In line with the findings on the challenge of resistance to change, Jackson and Miller (2024**)** point out that resistance to innovation, particularly those driven by fear of job displacement, low motivation, or attachment to traditional methods of doing things, remains a barrier in library digitization efforts.

Furthermore, the study established that lack of institutional support also poses a challenge to the adoption rate of big data by librarians. To corroborate this, Okonkwo and Salami (2021) highlight that institutional leadership and policy support are critical for big data integration. It was reported that the absence of institutional support often results in underutilized systems and uncoordinated efforts. Thus, lack of or inadequate institutional support may result in non-adoption or underutilizsation of big data by librarians. This finding aligns with Okechukwu's (2022) recommendation on the necessity for standardized protocols to ensure data quality and facilitate the integration of datasets from diverse sources. Okechukwu highlights that the lack of standardized protocols makes it challenging to integrate and compare data across different platforms, which is crucial for effective scholarly communication. Additionally, Akomolafe (2023) asserts that inconsistencies in data formats and the absence of standardization pose significant challenges, complicating the ability to integrate and utilize data efficiently for robust scholarly activities. These issues underscore the importance of standardizing data protocols to enhance the usability and reliability of big data in scholarly communication.

In support of this study's findings on the challenge of insufficient training and skills, Nwachukwu and Emeka (2024) emphasize that many librarians in developing countries lack the technical capacity to manage big data resources effectively, which hinders their adoption. Alarape (2024) likewise emphasized the need for training and support to ensure adoption of big data by librarians. Francis and Lewis (2024) noted that privacy issues and fears of data protection are additional factors that often limit librarians' enthusiasm to adopt new technologies. These challenges, if not properly attended to, will continue to hamper the adoption of big data for scholarly communication and relevant service delivery in the library.

CONCLUSION

The integration of big data into academic libraries has gained prominence, particularly in its potential to enhance scholarly communication. As information becomes increasingly digitized, librarians are increasingly required to harness big data to support research activities, knowledge dissemination, and the overall scholarly communication process. This study investigated the availability, influencing factors, and challenges related to the adoption of big data for scholarly

communication among librarians in selected academic libraries. Findings revealed that several types of big data resources, such as government data, social media data, machine-generated data, and science databases, are increasingly available and adopted by librarians for scholarly communication purposes. Librarians acknowledged the availability of digital repositories and cloud-based systems that enhance access to scholarly content. Regarding influencing factors, the study found that training availability, institutional support, and technical skills were major enablers of big data adoption. Conversely, several challenges were identified to inhibit big data adoption among librarians. These include high cost and resistance to change, which ranked highest among the constraints, followed by concerns such as insufficient training, data privacy, and system complexity.

The study concludes that librarians perceived big data resources as available for enhancing scholarly communication. The availability of big data resources is considered crucial, as they influence the extent to which librarians would adopt big data for scholarly communication and other professional activities. Despite the huge benefits, librarians still face multiple interconnected challenges in adopting big data, including financial limitations, resistance to change, and concerns over data protection and privacy. These findings align with recent literature and suggest that comprehensive strategies be put in place for meaningful use of big data in scholarly communication. Hence, for effective adoption, there is a need for a holistic and strategic approach to big data adoption and integration in Nigerian university libraries. The study therefore recommends that universities should invest in continuous training and professional development programs to improve librarians' technical competencies in data analytics and big data resources and enhance their research productivity. Similarly, to strengthen institutional support for librarians, universities and library management should create enabling environments through increased funding, policies, and leadership that prioritize innovation and data-driven services. The administrators of the university libraries should engage librarians and other library staff through awareness campaigns and participatory approaches to encourage their adoption of big data. Also, the federal, and state, and local governments should provide financial support to libraries through grants and partnerships to offset high infrastructure, maintenance, and subscription costs.

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