

ORGANISATIONAL PERFORMANCE MEASUREMENT OF NIGERIAN INDIGENOUS CONTRACTORS USING KEY PERFORMANCE INDICATORS

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Abstract

Measuring organisational performance of construction firms with project level Key Performance Indicators (KPIs) is the norm in Nigerian construction industry like in many other countries. This has been found inadequate to measure overall performance of construction firms hence KPIs measured at organisational level are necessary and already relevant to contracting firms in several countries. Nigerian Indigenous Contractors (NICs) are largely assessed through project level KPIs and this has contributed to below average organizational performance resulting in close down of many firms and difficulties in delivering large construction projects. Current studies into KPIs on the global front have helped construction firms shape performance strategies and enhanced their competitive advantage, but the NICs lack KPIs that address the peculiarities of the industry in Nigeria. This study critically examines KPIs at organizational level of NICs. Through literature review, 75 KPIs were synthesized and used. Factor analysis was used to reduce the KPIs to 53 separated into 6 measurable factors. Structured questionnaire was administered to a sample of 486 construction firms obtained from a population of 1669 firms in Abuja, Lagos and Rivers, 256 were returned representing 53% response rate. Factors were ranked using mean and standard deviations. Results revealed Procurement factors ranking highest with an average mean of 5.98, followed by business procedure and finance, which equally ranked high at 5.94 and 5.79 respectively. Other factors identified include organisational knowledge and project management factors with means of 5.72 and 5.43 respectively, while environmental factors ranked lowest at 4.41. The study identified latent KPIs relevant for measurement of organisational performance in NICs. The study concluded that the KPIs identified are significant indices for measuring organisational performance of NICs considering the high mean scores (above 4.41) of derived factors. It is recommended that NICs inculcate these measurable indices for adequate assessment of their organisational performance.

Keywords: Construction; Key Performance Indicators; Nigerian Indigenous Contractor; Organisational Performance.

INTRODUCTION

Considerable researches have been seen on the advancement of Key Performance Indicators (KPIs) for different types of

construction projects (Sohail and Baldwin, 2004). In recent times, researchers have moved the focus of their research from the traditional iron triangle

of time, cost and specification (Toor and Ogunlana, 2010). For example, one fundamental deviation is the study by Chan and Chan (2004) that separated KPIs into 8 objective measures and 6 subjective measures. Construction time, speed of construction, time variation, unit costs, percentage net variation over final cost, net present value, accident rate and Environment Impact Assessment (EIA) scores were listed as objective indicators and subjective indicators listed are quality, functionality, end user's satisfaction, client's satisfaction, design team's satisfaction and construction teams' satisfaction. Nitithamyong and Skibniewski, (2006) looked at KPIs from a broader perspective, they considered, strategic plan, risk, and communication as key indicators with measurable indices in addition to the KPIs in the traditional iron triangle. Similarly, stakeholder satisfaction was included as a KPI in a study of the performance of project plans (Idoro, 2009). Toor and Ogunlana, (2010) also posited that safety, efficient use of resources, effectiveness, reduced conflicts, and disputes are increasingly becoming important as KPIs on large public sector development projects. Furthermore, in a study of the sustainability of green buildings Konstantinos, Odysseus, and Dimitrios, (2012) identified 7 indicators to include: reduction of Waste; Customer Satisfaction; Education of Personnel, Capacity Utilization; Service and Quality; Client Cooperation; and Use of Technology as KPIs. However, these are performance measurements that concentrates at the project level and do not consider measurements at the organizational level of construction firms.

Researches into KPIs in more recent times have improved on performance evaluation areas to include not only the indicators that measures at project level but also the firms, stakeholders' management and human resource levels (Gudiene, Banaitis, Banaitiene, and Lopes, 2013; Ali, Al-Sulaihi, and Al-Gahtani, 2013; Alias, Zawawi, Yusof, and Aris, 2014; Wibowo, Astana, and Rusdi, 2015; Goodenough, Albert, and Ayirebi, 2017, Hidiroglu, 2019). Similarly, performance measurement of organizational effectiveness (both financial and non-financial dimensions) has been identified to be a priority contributing to project success (Hidiroglu, 2019). This area of research is however still limited and country-specific with developed KPIs that are suitable for specific national construction sectors (Toor and Ogunlana, 2010; Landstrom, Almstrom, Winroth, Andersson, Oberg, Kurdve, Shahbaze, Wiktorsson, Windmark, and Zackrisson, 2018). In addition, Alias *et al.*, (2014) averred that there is no comprehensive study that explores the important success factors which impacts on performance at the organisational level thereby suggesting an investigation into success factors which enhances organisational performance from a project management perspective.

Developing construction firms' organisational capacity is important because it impacts directly on their performance in the industry. The Nigerian Indigenous Contractors (NIC) have faced many challenges in the industry. For example, they have been plagued with below-average performances in the delivery of large building, civil and heavy engineering construction projects (Adams, 1997; Chen, Chiu, Orr, and Goldstein, 2007;

Ogbebor, 2014). Other significant challenges include the lack of local skilled labor, power shortage, the unavailability of materials, and the unethical practices that are very common in the industry (Sanusi 2008). Performance indicators designed in different sections of construction firms for a combined objective of achieving project success lack an integrated way of measurement and monitoring (Fernanda and Milton, 2017). Also in a study of Business Performance Measurement Systems (BPMS), Landstrom *et al.*, (2018) identified that one primary pitfall is that KPIs are not clearly connected to the strategic objectives and goals of the organisation which makes it harder to understand the purpose of the specific KPI and why it is important for the organization. Considering the ever-rising competition in the construction market (Wibowo *et al.*, 2015), firms need to monitor their progress constructively through appropriate indicators to maintain their competitiveness to survive in national and international markets.

Advancing appropriate strategies for the improvement of contractors' performances through the prioritization of their KPIs will ultimately improve the categorization ratings of NICs as well as reduce the use of expatriate firms. The aim of this study is to critically examine Key Performance Indicators (KPIs) applicable to the Nigerian Indigenous Contractor (NICs) at the organizational level, with a view to identifying the more important indicators to measure their organizational performance.

ORGANISATIONAL PERFORMANCE MEASUREMENT SYSTEM

Performance measurement system is an important process that quantifies

efficiency and effectiveness (Wibowo *et al.*, 2015). This measurement system evaluates the operation of organizations to reveal their performance and for projects to reveal its success. Ali *et al.*, (2013) citing Cokins, (2006) posited that the main objective of performance evaluation is to assist managers and members of the organization to develop the direction, traction and speed of their organization. Therefore, the organizational performance measurement system is used as information to deploy policy and strategy and also to obtain feedback (Wibowo *et al.*, 2015). The current competition into global construction markets has necessitated companies to monitor their practices and results to ensure competitiveness. To survive these challenges and compete successfully, organizations need to monitor processes through KPIs (Antunes da Silva and Borsato, 2017).

Performance Indicator Perspectives

Several studies looked at performance indicators outside the project level as it affects different aspects of the constructing firm. The perspectives for deriving measurement factors are similar but with very distinct exceptions.

Ali *et al.*, (2013) identified forty-seven (47) indicators that were grouped into four (4) factors of financial, customer, internal business, and environment. Mohamad, Ibrahim, and Massoud, (2013) in their study of financial factors posited that a key financial performance indicator is the net-profit of the constructing firm because it is the primary goal of any firm. A firm's ability to compete and be successful in a project is a unit of the performances expected in the firm as the project success also contributes to the firms' overall success. They harmonized

twenty-three (23) factors affecting the company's net profit into two limited factors of internal (firm related factors) and external (market related factors). Wibowo *et al.*, (2015) also categorized bidding strategy as an important performance indicator at the organizational level where five (5) factors of financial; internal business processes; learning and growth; customer satisfaction; and environment were identified as performance measures on the organizational level. Tripathi and Jha (2017) studied KPIs at organisational level of developing countries and identified twenty (20) organizational performance attributes which resulted in six (6) performance factors of: profitability and asset management; satisfaction of key stakeholders; predictability of time and cost; environment, health, and safety (EHS); quality consciousness; and low staff turnover. In a different perspective, Alias *et al.*, (2014) looked at Critical Success Factors (CSFs) in project management as inputs to project management practice which can lead directly or indirectly to project success. Twenty - two (22) indicators were reduced into five (5) perspectives of project management action; project-related factors; project procedures; external issues; and human factors. The importance of CSFs is that they are useful in decision-making which can significantly affect the performance of projects. CSFs can also be used as performance indicators for construction firms as the concept of CSFs presents a smarter way to identify certain factors which when present or absent in a project are likely to make the project successful (Gudienne *et al.*, 2013). Similarly, the negative impact of construction activities on the environment has necessitated

sustainability studies around the world. The United Nations development agenda created the Sustainable Development Goals (SDGs) with two (2) of the key areas being to build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation; and to make cities and human settlements inclusive, safe, resilient and sustainable (Gaffney, 2014; Osborn, 2015). This global development agenda made construction organisations performances include sustainability measures. Afzal, Lim, and Prasad, (2017) reported fifteen (15) sustainability performance indicators adopted by the Global Reporting Initiative (GRI) reduced to three (3) factors of economic, social and environmental indicators. Sustainability has become a cogent requirement for constructing firms to abide with if they are to compete globally in any regard.

Key Performance Indicators at the Organizational Level

In the aggressive and competitive atmosphere existing in the construction industry, construction firms require constant self-checks to ascertain their performance. Business performance is usually measured in quantitative terms of net profits and total turnover, however contracting businesses rely also on qualitative measures like managers' competences and employee expertise to survive (Tripathi and Jha, 2017).

Lin, Shen, Sun, and Kelly, (2011) outlined steps required towards the measurement of performance of the construction organizations as: (i) Identification of appropriate Key Performance Indicators (KPIs) and (ii) employing the identified sets of KPIs in developing a proper performance

measurement framework for construction organizations. A synthesized list of

relevant key performance indicators is hereby presented in Table 1.

Table 1: Key Performance Indicators

Authors and Year	KPI Perspective (Constructs)	Key Performance Indicators (Measurements)	
Mohammad <i>et al.</i> , (2013)	Firm Related Financial Factors	1.Business Size 2.Sales Growth 3.Operating Cash Flow 4.Return On Assets 5.Leverage 6.Firm Debt Ratio 7.Firm Market Power 8.Cash Conversion Cycle	9.Working Capital Policy 10.Inventory of Turnover Rate 11.Inventory Management Efficiency 12. Receivables Management 13.Liabilities Management 14.Tangible Assets Ratio 15.Average Collection Period 16.Average Payment Period
	Market Related Financial Factors	1.Level of Economic Activity 2.Market Performance 3.Inflation Rate 4.Financial Distress	5.Demand on Construction 6.Competition 7.Cost of External Financing
Alias <i>et al.</i> , (2014)	Project Management Actions Factors	1.Communication System 2.Planning Effort 3.Organization Structure,	4.Effective Safety Programme 5.Quality Assurance programme 6.Sub-Contractor Management
	Project Procedures Factors	1.Procurement Method	2.Tendering Strategy
	Human Factors	1.Client's Experience 2.Nature of Client 3.Size of Client's Organization	4.Client's Project Philosophy 5.Client Decision & Briefing Skills
	Project Related Factors	1.Project Type 2.Project Nature	3.Project Complexity 4.Project Size
Afzal <i>et al.</i> , (2017)	External Factors	1.Economic Influences 2.Social Influences 3.Political Influences	4.Physical Influences 5.Technology Advancement
	Economic Sustainability Factor	1.Financial Performance 2.Market Presence	3.Indirect Economic Impacts
	Social Sustainability Factors	1. Community. 2. Human rights	3. Labour practice & Decent Work. 4.Product responsibility
	Environmental Sustainability Factors	1.Materials 2.Energy 3.Water 4.Biodiversity	5.Emissions and waste 6.Products and service 7.Compliance 8.Transport
Ali <i>et al.</i> , (2013)	Financial	1.Profitability 2.Growth 3.Financial Stability 4.Cash flow	5.Financial Performance 6.Capital 7. Invest. in Dev. of New Markets 8. Interest Cover
	Customer	1.Quality of Service and Work 2.Value for Money 3.Market Share 4. Hassle-free Relationship	5.Number of New Customers 6.External Customer Satisfaction 7.Competitive Price 8.Internal Customer Satisfaction
	Internal Business	1.Safety 2.Business Efficiency 3.Effectiveness of Planning 4.Labor Efficiency	9.Resource Management 10.Technological Capability 11.Productivity 12.Quality Control and Rework

Learning and growth	5.Successful Tenders Rate	13.Defects
	6.Managers Competency	14.Research and Development
	7.Innovation	15.Staff Turnover
	8. Number of high Performance Professionals	
Environment	1.Motivation	5.HR Training & Development
	2.Continuous Improvement	6.Informatization
	3.Investors in People	7.Empowered Work Force
	4.Organization Competency in Management of HR	
	1.Risk control	6.Waste
	2.Partnership and suppliers	7.Energy use
	3.Policy or law of government	8.Main water use
	4.Competitors	9.Impact on biodiversity
	5.Impact on society	

It was observed from literature that many of the constructs (indicators) overlap and measure similar factors. KPIs that are similar to each other and are under the same factor are merged in this study. An example is 'working capital' (Mohammad *et al.*, 2013) and 'capital' (Ali *et al.*, 2013) which are both under 'financials' factors. In the same light, some other constructs measure similar results but have been categorized under different factors, these type of overlap have been synthesized into one for this study. An example is 'profitability' and 'financial stability' both measuring the organizations quantitative success in turnover grouped under 'financial' (Ali *et al.*, 2013) and 'economic sustainability' (Afzal *et al.*, 2017) factors respectively have been merged. Subsequently, seventy-five (75) Key Performance Indicators (KPIs) are used to measure eight (8) factors which directly affect performance at the organisation level of contracting firms. The KPIs were examined for relevance to the factors that they measure and the relationship of the factors was also examined to ensure they relate to measuring the organizational performance of construction firms in Nigeria.

Construction firms as used in this study refers to Nigerian Indigenous

Construction firms that are fully-owned and managed by Nigerians; the nationality of the firms' ownership and management is exclusively Nigerian (Inuwa, Daniel, and Ahmad, 2014). A conceptual framework adopted for this study is presented in figure 2.

RESEARCH METHODOLOGY

A cross-sectional survey approach was adopted for the study employing a questionnaire administered online and sent to e-mails and registered phone numbers of construction firms to be answered by personnel who are in management positions in the contracting firms sampled. Managers were employed for the study to ensure reliability of responses and knowledge of key indicators as they affect the organization. The questions are designed to elicit responses on the significance of the KPIs in measuring organizational level performance and are rated on a 7 point Likert scale ranging from Very Low (VL) = 1 to Very High (VH) =7. The population was drawn from a list of 1,669 building & civil engineering construction firms registered on Vconnect an online directory of businesses in Nigeria with offices in Lagos, Rivers and Abuja. These location strata represent areas of high construction activities in Nigeria. In order to achieve a robust estimate within a

substantively important stratum, the disproportionate stratification sampling was adopted. With this method, the sample size of each stratum is not proportionate to the population size of the stratum (Kalton, 2001; Explorable, 2009). This method allows adequate sampling within concentrated strata, sampling of rare extremes and also optimizing statistical efficiency (Karlton, 2001; Sturgis, 2004). IBM SPSS Statistics V 25 was employed to analyse data received. First a test of reliability of construct was carried out to elicit the alpha values of the Key Performance Indicators (KPIs). An Exploratory Factor Analysis (EFA) was then used to confirm the groupings of the KPIs. Principal Component Analysis (PCA) for factor extraction was applied to reduce the KPI's into fewer numbers. To examine the appropriateness of the data collected for factor analysis, the Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy and Bartlett's test of sphericity were computed. Finally, the factors were ranked based on their mean and standard deviation to check internal consistency of responses. A comparison of the rankings was done between the respondent groups with the Kruskal-Wallis H Test.

Determination of Sample Size and Test of Adequacy

Due to unequal sizes of population, disproportionate sampling was employed using sample fractions of population in each stratum in relation to total

population. The minimum sample size required was derived using the formula (Ali *et al.*, 2013) in equations 1 and 2.

$$n = \frac{n^1}{(1 + n^1/N)} \dots\dots (1);$$

$$n^1 = \frac{(p \times q)}{V^2} \dots\dots\dots (2)$$

Where:

n = the required sample size; n¹ = first estimate of sample size; N = population size;
p = proportion of the characteristics being measured in stratum; q = 1 - p and;
V = standard error of sampling population (=0.10 for this study).

Using the formula, a sample size of 243 was obtained hence, 486 questionnaires were distributed, 256 were returned representing 53% response rate. However only 244 (50%) of the responses received was suitable for analysis and used for the study since this is above the minimum required sample of 243. The Summary of responses according to the strata is shown in Table 2. The test for adequacy utilized the Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy as averred by Field (2005) that values between 0.5 and 0.7 are mediocre, and values between 0.7 and 0.8 are good. In addition, Bartlett's test of sphericity which test the presence of correlation among constructs requiring p < 0.005 (Hair, Black, Babin, Anderson, and Tatham, 2006) was carried out.

Table 2: Location and response rate of respondents for the survey

Location (States)	Population (No.)	Proportion (p)	Req. Sample (n)	Questionnaires Distributed	Response used (No.) (%)		Adequacy
Lagos	740	44%	93	186	97	52	>Min.
Abuja	349	21%	64	128	59	46	< Min.
Rivers	580	35%	86	172	88	51	> Min.
Total	1669	100%	243	486	244	50	> Min.

Table 3: KMO and Bartlett's Test for Sample Adequacy

KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy		.813
Bartlett's Test of Sphericity	Approx. Chi. Square	32770.62
	df	6
		2775
	Sig.	.000

Table 3 shows results of the KMO test at 0.809. This is indicating that the sampling adequacy is very good. Equally Bartlett's test of sphericity at $p < 0.005$ shows that there is presence of correlation among constructs.

Reliability and Validity of Construct

The study utilized Cronbach's Alpha for test of reliability of construct. Table 5 shows that alpha values for each factor is greater than 0.70. The alpha reflects the extent to which the different KPIs tested produced similar measures and signifying a high relationship between the factors they measured (Taber, 2018). Elimination of construct using Exploratory Factor Analysis (EFA) requires high factor loadings to consider constructs. Hair *et*

al. (2006) considered factor loadings of 0.5 or greater as practically significant, hence this study only considered factor loading equal to or greater than 0.5. Furthermore, items loading on more than one factor that is, with a loading score equal to or greater than 0.4 on more than one factor was dropped from the analysis since cross loading variables make interpreting the factor difficult (Hair *et al.*, 2006).

RESULTS

Respondents Profile

The respondents for the study were drawn from different demographics as presented in Table 4.

Table 4: Respondents Profile

Demographics	Percentage spread of respondents				
Location	Lagos	Abuja	Rivers		
	40%	24%	36%		
Status in organisation	Top Management	Middle Management	Lower Management		
	57%	33%	10%		
Highest qualification	PhD	MSc/MTech	BSc/HND	Diploma	
	59%	28%	1%		
Work Experience	>20 yrs	16 – 20yrs	10 – 15yrs	5 – 8yrs	
	69%	11%	12%	8%	
Profession	Architect	Quantity Surveyor	Engineer	Builder	
	26%	32%	35%	7%	

Exploratory Factor Analysis (EFA)

Exploratory factor analysis is primarily used to reduce data to a smaller set of variables. In addition, it is also used to explore and identify the structure of the relationship between the variables and what they measure (Hair *et al.*, 2006). It assesses whether items should be eliminated from the scale because they have obtained data or are loaded in more than one factor (Field, 2005; Hair *et al.*, 2006& Taber, 2018). This study considered factor loadings of 0.5 or greater as practically significant.

Based on the eight (8) factor groupings shown in the framework (Figure 2), the analysis utilizing Varimax rotation with Kaiser Normalization and extraction of principal components with factor groupings having eigenvalues greater than 1.0 explains 69.78% of the variance. In addition, the results revealed that some constructs do not exhibit a simple structure. This means that they are loaded weakly on more than one factor grouping or loaded weakly with their synthesized factor grouping. In the study, 16 factors displayed one or both characteristics which include: eight (8) KPIs measuring financial and economic factors, three (3) KPIs measuring external and social

factors and all five (5) KPIs measuring human factors.

Subsequently the 59 KPIs retained after removing the 16 with unusual characteristics was subjected to a principal component analysis with Varimax rotation to examine the factor structure of the remaining measures. The scree plot indicated a convergence in six (6) iterations hence, 53 factors have emerged with eigenvalues above 1.0, explaining 75.54% of the variance in the data, as shown in Table 5.

The commonalities of all KPIs are higher than the cutoff level adopted for this study. In addition, all KPIs show clean loadings in the new factor structure extracted. Hence, the 53 KPIs can be grouped into 6 principal components of finance (firm and market) factor, environmental factor, procurement factor, project management factor, business procedure factor and organizational knowledge factor.

Ranking of Measurement Factors for KPIs

The mean and standard deviations of the factors were investigated to create a ranking structure. In addition, similarities in the ranking were investigated between the three strata of Lagos, Abuja and

Rivers. Results in Table 6 show similarity in the perception of the respondents in the ranking of the factors. In addition, Kruskal-Wallis test was carried out to check the similarity in distribution of the groups from their ranked mean. The

Kruskal-Wallis One-Way Analysis of Variance by Ranks Test is a non-parametric version of the independent measures (One-Way) ANOVA that can be performed on ranked data (Richardson, 2018).

Table 5: Principal Component Analysis.

FACTORS	CONSTRUCT (KPIs)	F1	F2	F3	F4	F5	F6	Alpha
FINANCIAL (FIRM & MARKET) FACTOR								
	Firm debt ratio	.968	-.092	-.023	.009	-.110	.024	.989
	Profitability	.968	-.088	-.030	.010	-.109	.014	
	Cost of external financing	.967	-.084	-.030	.003	-.113	.009	
	Level of economic activity	.965	-.079	-.021	.002	-.110	.001	
	Leverage	.963	-.066	-.037	.001	-.103	-.008	
	Competition	.961	-.102	-.033	.011	-.105	.029	
	Working capital policy	.958	-.080	-.024	-.005	-.119	.000	
	Customer satisfaction	.948	-.069	.016	-.010	-.037	.027	
	Business size	.947	-.032	.020	-.032	-.047	-.007	
	Operating cashflow	.941	-.094	-.036	.011	-.104	.046	
	Market share	.939	-.074	.004	.008	-.060	-.006	
	Competitive price	.933	-.094	-.010	-.032	-.052	.001	
	Quality of service and work	.922	-.132	-.057	.002	-.113	.041	
	Value for money	.907	-.107	-.035	.020	-.034	.053	
	Inflation rate	.876	-.089	.003	-.054	-.071	.049	
	Empowered workforce	.851	-.005	.075	-.077	-.026	-.010	
	Informatisation	.807	-.066	-.005	-.066	-.107	.044	
	Continuous improvement	.807	-.038	.061	-.024	-.060	.021	
	Motivation	.745	.014	.102	-.031	.022	-.013	
	Investment in people	.726	-.004	.077	-.009	.021	.033	
ENVIRONMENTAL FACTOR								.980
	Partnership and suppliers	-.080	.974	.017	.028	.054	.046	
	Project type	-.076	.972	.017	.032	.052	.055	
	Material use	-.073	.955	.023	.016	.052	.044	
	Human rights of third party	-.109	.941	.018	.026	.051	.043	
	Risk control	-.045	.938	.013	-.034	.033	.024	
	Transportation	-.106	.886	.036	.044	.047	.047	
	Project complexity	-.075	.884	.025	.047	.065	-.018	
	Main water use	-.075	.857	.063	-.022	-.006	.106	
	Impact on society	-.088	.849	.001	.068	.084	-.063	
	Project size	-.082	.848	.047	-.018	-.013	.100	
	Emission and waste	-.105	.843	-.039	-.011	.060	-.017	
	Product & service responsibility	-.041	.836	.069	-.044	.056	.061	
	Project nature	-.058	.832	.044	-.012	.001	.035	
	Energy use	-.050	.800	.032	-.017	.007	.020	
	Fulfilling Gov. policies/laws	-.043	.765	.046	.082	.023	.058	
	Impact on biodiversity	-.031	.699	-.126	.088	.053	-.097	
PROCUREMENT FACTOR								.985
	Procurement method	-.008	.073	.964	.022	.042	-.076	
	Effective safety programme	.012	.056	.963	.003	.035	-.068	
	Quality assurance programme	.014	.065	.954	.006	.034	-.082	
	Tender strategy	.018	.052	.954	.030	.037	-.061	
PROJECT MANAGEMENT FACTOR								.882
	Organisational structure	-.044	-.014	.014	.881	-.171	.117	
	Communication system	-.061	-.015	.016	.862	-.190	.099	
	Productivity	-.018	-.037	.033	.859	-.176	.123	
	Labour efficiency	-.017	-.037	.026	.849	-.169	.137	
	Physical influences	-.018	.225	-.025	.502	.315	-.336	
BUSINESS PROCEDURES FACTOR								.941
	Sub-contractor management	-.037	-.055	.164	-.099	.814	.117	
	Resource management	-.035	-.052	.166	-.021	.814	.137	
	Planning effort and effect	-.065	-.031	.187	-.084	.786	.128	
	Business efficiency	-.053	-.013	.079	-.043	.770	.087	
ORGANISATIONAL KNOWLEDGE FACTOR								.969
	Freq. of rework & defects	.037	.133	-.082	.068	.011	.906	
	Innovation	.000	.128	-.066	.061	.041	.902	
	Technology capability	.048	.107	-.059	.016	.000	.891	
	Manager and staff competence	.086	.103	-.081	.061	.040	.871	

Table 6: Ranking of the Measurable Factors

Performance Factor Groups	Lagos N = 97			Abuja N = 59			Rivers N = 88			All 3 Strata N = 244
	Mean	SD	Rank	Mean	SD	Rank	Mean	SD	Rank	Mean
Procurement Factors	6.021	0.771	1	6.034	1.241	1	5.906	0.864	2	5.983
Bus. Procedure Factors	5.977	0.868	2	5.962	0.832	2	5.910	0.770	1	5.948
Financial Factors	5.946	0.884	4	5.372	1.101	5	5.903	0.784	3	5.792
Org. Knowledge Factors	5.948	0.981	3	5.660	1.308	3	5.497	1.268	5	5.718
Project Mangt. Factors	5.175	1.241	5	5.492	1.068	4	5.682	0.872	4	5.434
Environmental Factors	4.482	0.993	6	4.775	0.942	6	4.083	0.989	6	4.409

From the ranked means of the 3 groups above the Kruskal-Wallis Test were used to determine whether there are statistically significant differences between the three groups. This test method is employed because based on locational influences, the three groups are exposed differently to the factors measured, and, there is considerable difference in the number of subjects for each comparative group (MacFarland and Yates, 2016).

Therefore, the following hypothesis was tested using the Kruskal-Wallis test:
 H_0 ; there is no significant difference between the measurable factors,
 H_1 ; There is a significant difference between the measurable factors.

Using an Alpha value of 0.05 and a degree of freedom of 2 ($df = k-1$ where k is number of groups) The H value should be less than or equal to 5.99 to retain the null hypothesis (Stephanie, 2016).

Table 7: Kruskal-Wallis Test for Group Differences

Kruskal-Wallis Test			
Descriptive Statistics	Mean	5.54028	
	Standard Deviation	0.570272	
Test Statistics	Chi-square	0.246000	
	Df	2.000000	
	Asymp. Sig.	0.884000	

The results of the Kruskal-Wallis test show there is no significant difference among the three groups of Lagos, Abuja and Rivers with $H = 0.246$ (2, $N = 18$), $p > .05$.

DISCUSSION OF FINDINGS

The empirical results obtained in this study have provided useful findings and implications for the Nigerian Indigenous Contractors. Organisational performance

factors were prioritized in accordance to the factors highlighted in Table 6.

Procurement factors comprising KPIs such as procurement method, tender strategy, quality assurance requirements and effective safety programmes with factor loadings of 0.964, 0.963, 0.954 and 0.954 respectively generated an average mean of 5.98 thereby ranking highest amongst other factors identified for the measurement of organisational perform-

ance of NICs. This factor is consistently ranked highest in both Lagos and Abuja and ranked second in Rivers. The standard deviation of 0.809 also shows a good internal consistency in the responses from the strata surveyed. Lagos showed the highest consistency with standard deviation of 0.77 while Rivers despite ranking the factor as second still has a standard deviation of 0.86. The KPIs measured under this factor is consistent with the previous findings of Ali *et al.*, (2013) that posited procurement methods and tender strategy as internal business factors and Alias *et al.*, (2014) positing quality assurance requirements and effective safety programmes as project procedure factors. Similarly, Wibowo *et al.*, (2015) highlighted the importance of bidding strategy to the overall performance of a construction firm. The bidding strategy is posited to contribute largely to a firm's success in securing new projects and ensuring competitiveness.

Business procedures which show the importance of how construction firms do business ranked second amongst the six factors identified in this study with KPIs such as sub-contractor management, resource management, planning efforts/effects and business efficiency all revealed factor loadings above 0.70. Lagos and Abuja strata ranked business procedures second while in this case Rivers ranked it first. Alias *et al.*, (2014) equally identified these constructs as Critical Success Factors (CSF) from the perspective of project management practitioners looking at organisational performance of construction firms in projects. Measuring these as KPIs is seen by respondents as important to the organisational performance of construction firms.

It is surprising to find that finance factors though having the largest measurable KPIs (20) ranked third overall in the position of KPIs measured in this study despite a factor loading ranging from 0.726 – 0.968 on the KPIs. Bearing in mind the pivotal nature of financial aspects of running a business, procurement and business procedure factors ranked higher in this regard. This finding supports Hidirolu, (2019) who strongly posited that organisational performance measurement has been identified to be a priority to project success and it should be viewed in both financial and non-financial dimensions. With an average mean of 5.792 and a standard deviation of 0.937, the factor is equally worthy of note. Also surprising is that Lagos and Abuja ranked it fourth and fifth respectively, though the standard deviation in Abuja suggest an inconsistency in the responses, Rivers on the other hand showed a standard deviation of 0.78 which shows fair consistency in the responses and also ranked it third.

Organisational Knowledge factor comprising KPIs such as frequency of rework, innovations, technology capability and manager/staff competence with factor loadings ranging from 0.871 – 0.906 was ranked fourth overall with a mean of 5.718. The internal consistency of the responses however seems low. Despite the overall results, Lagos and Abuja both ranked it as third while Rivers ranked it fifth. Similarly, project management factors were ranked fifth overall with a mean of 5.434 with weak consistency in the responses at a standard deviation of 1.105. Lagos equally ranked this factor fifth while both Abuja and Rivers ranked it fourth.

Environmental factors ranked last in the study. This is consistent with all strata sampled. The mean for the factor is 4.409 and standard deviation showed a fair consistency < 1 . KPIs measured under this factor include impact on society, fulfilling government policies, emission and waste project nature, amongst others. The consistency in ranking this factor as last could be a result of the fact that strict environmental laws are not firmly in place in Nigeria.

Generally, the results from the three groups can be seen as similar because there is no significant statistical difference among the three groups $H = 0.246$ (2, $N = 18$), $p > .05$. This position suggests a very high consistency in the perception of the respondents to the ranking of these Organisational Key Performance Indicators.

CONCLUSION & RECOMMENDATIONS

This research has presented a systematic study on the KPIs for measuring organisational performance of NICs. It has advanced the knowledge in the field by identifying and subsequently ranking the important KPIs for measuring organisational performance factors in Nigeria. The study has determined Key Performance Indicators for measuring the organisational performance of Nigerian Indigenous contractor. Fifty-three KPIs were identified in this study and grouped into 6 factors of finance (firm and market) factor (20 KPIs), environmental factor (16 KPIs), procurement factor (4 KPIs), project management factor (5 KPIs), business procedure factor (4 KPIs) and organisational knowledge factor (4 KPIs). Five of these factors are significant with mean scores above 5. Procurement factors was ranked first,

business procedure factor ranked second, finance factor ranked third, organisational knowledge factor ranked fourth and project management factor ranked fifth. The sixth factor is environmental factor which pooled a mean below 5.

The results from this study would help NICs in properly measuring their performance at the organisational level thereby improving their competitive advantage and enhancing their project delivery. Also the research study will help agencies in government sector and other construction clients in developing metrics for evaluating the organisational performance of potential contracting firms to be employed for construction works.

It is recommended that NICs should adopt a measurement matrix along these factors to help improve their performance measurement systems. Equally in the selection of contractors for public works, these factors should be considered to ensure that competent organizations with good internal performance measures are selected. An Organisational Performance Index can evolve from this study and such reports can be incorporated into individual quality assurance reports to be submitted by NICs for public works.

One of the limitations of this research is that the samples were taken from only three strata, though representing regions of high construction activity in the country but further research could be conducted to test the KPIs in other areas. Although the statistical analysis has indicated that the findings are valid and can be generalized to a wider context, it would have been better if more samples from different strata could be acquired. Another direction to further this study is

the development of a framework for the measurement of the KPIs to be adopted by NICs in particular and the construction industry in general.

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