The Exploratory Factor Analysis of Quality Performance Indicators in Building Projects in Lagos State.

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ABSTRACT

This paper accessed the view of building construction professionals on the factor that influences the usage of quality performance indicators in construction industry. A total of twenty-six (26) factors that influence the use of quality performance indicators were obtained from literature. The questionnaire survey was distributed to randomly selected respondents from a combination of clients, consultants, contractors, site engineers, project builder project managers. A total of one hundred (100) questionnaires were used for this research using tools such as percentile, frequency, mean score rating, standard deviation and factor analysis. Findings of the study shows that; Cost of quality, Inspection and testing of executed works, Use of less-substandard materials, Untimely project delivery and Non-enforcement of statuary requirement are the first five (5) ranked factors that influences the use of quality performance indicators by professionals. This study concluded that the identified factors which were further categorized using factor analysis into: project Quality factors, workforce related factors, project delivery factors, risk related factors and resource related factors are relevant and important to each aspect of construction and for easy implementation of these factors with a view of enhancing project delivery.

Keywords: Building Construction Professionals, Construction Project, Quality Performance Indicator, Quality management, Exploratory Factor Analysis.

INTRODUCTION

Uncertainty and complexity characterize the construction sector (Mahamid, 2020). Uncertainty in construction projects can arise from a variety of factors, including contractual relationships, resource availability, and the performance of construction parties (Abd El-Karim et al., 2017). In construction, quality refers to the level of customer satisfaction achieved within a given budget (Modi et al., 2017). The quality of design and contractual documents process can be defined as “The ability to provide the contractor with all the information needed to enable construction to be carried out as required and efficiently and without hindrance” (Tilley, 1998). In many countries, there has been a lot of criticism for inefficiencies in outcomes such as poor quality and less satisfaction on the part of the customer (Chan, Chan, & Ho, 2003). It is essential that every project is completed successfully. The success of a project depends on the performance of several key factors, including overall performance, quality, cost, and schedule (Thompson et al., 2017). Performance is associated with the project's success according to traditional trainable that is given time budged cost and required quality (Kulatunga et al. 2005).

According to Ong'ondo, C. B., Gwaya, A. O., & Masu, S. (2019), enhancement of building projects Performance continues to be a vital element and catalyst for the global development of the construction sector, and as such, it merits careful consideration. Performance measurement is a process of assessing a project by quantifying variables related to its efficiency and effectiveness (Neely, 1999). Effectiveness can be defined as the degree to which customer satisfaction is achieved and how efficiently companies manage their resources. According to Hijazi (2021), critical success factors (CSFs) and critical failure factor (CFFs) have been studied by a great

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number of scholars in order to improve the effectiveness of construction projects. For a project to be successful, it is necessary to understand the CSFs right from the beginning (Ranawat, et al., 2018)

Construction deficiencies have been mostly caused by the decline in design quality as measured by standards. According to Dikko (2013), the weakness of Nigerian construction companies has been largely caused by a lack of awareness, knowledge, and skills, objective assessment, staff training, feedback, and the natural use of total quality tools and processes. Equally significant are the problems of contractors and clients hiring quacks and using subpar building materials in an attempt to save money, which frequently leads to mishaps and fatalities both during and after the building process. Various researchers have identified these issues related to quality in the construction sector. A significant concern is the rate at which building collapses are happening. As noted by Ojo and Ijatuyi (2014), referencing Abdul Kareem & Adeoti (2010), a further issue is that large construction projects play a crucial role in boosting the economy, enhancing the standard of living, and improving societal welfare, making them a matter of national public concern.

Therefore, this paper intend to discuss how project participants and their interaction affect quality of building projects by classifying and grouping the quality performance indicators factors for ease of implementation among building professionals for one of the largest city in Africa, Lagos State with the view of delivering good building projects. The specific objective is to establish different components of quality performance indicators from exploratory factor analysis.

In this modern age, more complex and daring structures are springing up in the construction Industry. The large scale and complexity of these modern age projects also came with its own challenges and problems, one of which included building collapse (Kheni & Ackon, 2015). Therefore proper quality assurance and quality management are needed. Quality plays a crucial role in all building projects worldwide because it influences the overall effectiveness and performance of construction projects. In Nigeria, the construction industry is particularly concerned about quality because building collapses are a major issue there, and quality is being used as a weapon to address and lessen this challenge. This makes it crucial to comprehend the standards for quality in building construction projects and the factors that influence them in order to potentially handle quality issues more effectively.

Therefore, the main goals of this research are to help clients understand how important quality is in building projects, even though it goes against many of their personal preferences; help contractors cut down on errors and rework to save time; help project participants identify deficiencies at different stages and how their interactions can affect building quality by identifying critical factors influencing the use of quality performance indicators, and how it can help them perform better in the nation's private, public, and commercial building construction projects.

LITERATURE REVIEW

The Nigeria construction industry is divided into “formal and Informal” sectors. The formal sector comprising of residential buildings and similar structures built by private citizens while the informal constitute all major companies legally registered carrying out organized construction projects with highly skilled expatriates and labourers (Dantata 2007). According to Adebayo (2000), the skills, experience and personal ability of the workmen involved in the building construction is of utmost importance in creating value.

Quality management is the monitoring of all activities and tasks that must be carried out to maintain the desired level of excellence (Nnorom & Olagbaju, 2020). Quality management can be divided into quality assurance (QA) and quality control (QC). According to ISO9000 (2015), quality assurance is concerned with the activities that the laboratory undertakes to provide confidence that the quality requirements are met, while quality control describes the individual measures used to conform and report fulfillment of the requirements. Meanwhile, Project management includes planning, organizing, monitoring, controlling and reporting all processes of a project (Abdelalim & Eldesouky, 2021). It is therefore imperative that, In order to achieve project goals, it is crucial to control project processes within the Quality management system. Quality management systems can help contain and eliminate rework/non-conformities; increase customer satisfaction; performance and provide the catalyst for synergies in terms of project parameters such as customer satisfaction, cost, quality and time

(Smallwood & Rossouw, 2008). Measures of process performance that are essential to the project's success are called performance indicators (Takim and Akintoye, 2002). According to Gosselin (2005), performance indicators are quantifiable values that are used to assess, evaluate, and control the overall performance of an organization. Additionally, benchmarking can be used to accomplish this (Takim et al. (2002). The goal of benchmarking is to comprehend current procedures and activities while also determining an external standard or point of reference that can be used to measure or evaluate those activities. Benchmarking is the methodical process of evaluating how well businesses perform their operations in comparison to others, then applying the knowledge gained from the best to make specific improvements.

Results are the focus of quality performance in construction, which looks for indications of quality consciousness in a building team's operations and output. According to Arditi and Gunaydin (1998), quality performance is also defined over an extended period of time in order to have a lasting impact. Stated differently, it is anticipated that enhancements in quality performance will boost contractors' profitability and productivity while also raising customer satisfaction.

Performance measurement is a systematic way of evaluating the inputs and outputs in manufacturing operations or construction activity and acts as a tool for continuous improvement (Mbugua et al., 1999), hence the need to evaluate the important factors necessary in identifying key performance indicators for successful project. According to Pillai, Joshi, & Rao (2002), a performance measurement system is required to reflect the needs and expectations of all the stakeholders. Most widely practiced performance measurement models in construction industry include financial and non-financial areas (Ingle & Mahesh, 2022).

METHODOLOGY

In order to gather the necessary data and determine the factors influencing Nigerian professionals' use of quality performance indicators, this study used the survey research design method. This research approach was conducted using a structured questionnaire and a literature review. The goal of the literature review was to identify and better understand factors leading to the use of quality performance indicators

The questionnaire is designed in a close ended format, providing responses from which choices could be made using the Likert- scale format with an exemplary anchor of (1) – Never to (5) – Always, to avoid unreliable and inaccurate information from respondents. Questionnaires were distributed randomly to the respondents handling construction projects in the study area.

Because it is impossible to determine the precise number of active projects in Lagos State, a purposive sampling technique was used to conduct this study. Eliminating those who don't fulfill the requirements has proven beneficial because it saves time and money and improves results because the focus is on the population under study. Professionals like project managers, project and site engineers, quality managers, architects, quantity surveyors, civil and structural engineers, builders, mechanical and electrical engineers, and others were chosen as the survey's target population based on sampling techniques used in the preliminary stage. Lagos State has a population of 9,013,534 based on the last census, hence, the study was conducted in Lagos State on the basis that 75% of construction companies in Nigeria are either based in Lagos State or having their branches located in Lagos (Fagbemi, 2008). Purposive sampling technique was adopted to carry out and this helps the study to be directed towards a defined group of respondents who are best able to respond to the research issues (Ibrahim 2011), which are construction professionals who are involved with construction projects within Lagos metropolis.

One hundred and thirty (130) construction professionals from construction firms in Lagos State were used as sample size for this study. The projected sample was chosen using the rules of thumb, cited in (Cavana, Delahaye & Sekeran, 2001) which suggest that sample size which is not more than 500 but greater than 30 is appropriate for any academic research. 130 Questionnaires were distributed randomly to both private and public sector while 100 was retuned and used for this research. The factors influencing the use of quality performance indicators for building project used in the questionnaire were collected through thorough review of related literature and hence were identified for use. The respondents were asked to rate their level of awareness of the factors influencing the use of quality performance indicators in the construction industry.

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PRESENTATION OF RESULTS AND DISCUSSION

General Information of Respondents

According to table 1, the information collected from the 100 usable questionnaires, 1% of respondents identified themselves as project builders, 14% as project coordinators, 11% as project engineers, 32% as project managers, 1% as quality managers, and 36% as site engineers. Additionally, 5% of respondents specified other designations, including quantity surveyor and architect. which demonstrate how pertinent the opinions sought are and how they continue to work in one or more construction-related areas.

In relation to their professional background; findings shows that 9% of the respondents are architects, 58% are builders, 18% are civil engineers, 2% are mechanical and electrical engineers and 13% indicated that they are quantity surveyors. Ninety five percent (95%) of these professionals were designated as quality manager, project builder, coordinators, project engineers, managers and site engineers while ninety seven percent (97) of the respondents are corporate members of key construction professional bodies and are made up of 9% as members of NIA, 56% affiliated with NIOB, 12% affiliated with NIQS while 20% are members of NSE. The remaining 3% of the respondent have other less qualified professional qualification; and these functions are directly involved in the core construction activities where issues of quality are of great concern. The respondents' years of experience are as follows: 36% of the respondents had worked in the construction industry for 0–5 years. A total of 35% of the respondents have more than ten (10) years of comparable experience, and 64% of the respondents have more than five years. Respondents with more years of experience are better informed and able to offer more persuasive comments because they are more familiar with the events occurring on construction industry.

The types of project executed were also investigated. The projects include Residential buildings -- multiunit housing estate/hostel (44%)), Non-Residential building project (17%), Commercial/ Special trade building projects (15%), public utility construction (5%) and 19% of the respondents indicated that they have been involved in Civil works. Further investigation showed that, thirteen (13%) of the respondents were developers, 21% of the respondents were consultants, 54% and 8% of the respondents worked with main contractors and subcontractors respectively while 4% of the respondents were involved in other roles. This implies that this study takes into consideration the interest of the various stakeholders in construction hence; their opinions were well represented in the study.

Table 1: Demographic information

Characteristics of the Respondents		Frequency	Percentage
Designation of respondent			
	Architect	1	1.0
	Deputy Manager Procurement and Logistics	1	1.0
	Project Builder	1	1.0
	Project Coordinator	14	14.0
	Project Engineer	11	11.0
	Project Manager	32	32.0
	Quality Manager	1	1.0
	Quantity Surveyor	1	1.0

	Site Engineer	36	36.0
	Student	1	1.0
	University Lecturer	1	1.0
	Total	100	100.0
Professional background			
	Architect	9	9.0
	Builder	58	58.0
	Civil engineer	18	18.0
	Mechanical and Electrical Engineer	2	2.0
	Quantity Surveying	13	13.0
	Total	100	100.0
Professional qualification			
	Graduate builder	1	1.0
	NIA (Nigeria Institute of Architect)	9	9.0
	NIM (Nigeria Institute of Management)	1	1.0
	NIOB (Nigerian Institute of Building)	56	56.0
	NIQS (Nigeria Institute of Quantity Surveyor)	12	12.0
	NSE (Nigeria Society of Engineers)	20	20.0
	Student	1	1.0
	Total	100	100.0
Years of experience			
	0-5years	36	36.0
	11-15years	17	17.0
	16-20years	4	4.0
	21-25years	7	7.0
	26years and above	7	7.0
	6-10years	29	29.0
	Total	100	100.0

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Building projects			
	Civil works	19	19.0
	Commercial	15	15.0
	Non-Residential	17	17.0
	Public Utility	5	5.0
	Residential (multi-unit housing estate/hostel)	44	44.0
	Total	100	100.0
Role of respondent's company			
	Client	1	1.0
	Client Representative	1	1.0
	Consultant	21	21.0
	Cost Estimator	1	1.0
	Cost manager	1	1.0
	Developer	13	13.0
	Main Contractor	54	54.0
	Subcontractor	8	8.0
	Total	100	100.0

Factors that influence the use of quality performance indicators in the delivery of building project

Table 2 identifies the factors that influence the use of quality performance indicators in the delivery of building project. Highest ranked factors include: financial involvement or cost of quality ranked 1st with mean score of 4.46, inspection and testing of executed works ranked 2nd with a mean score of 4.18 and use of less substandard materials ranked 3rd with a mean score of 4.12.

Cost of quality or financial involvement is very essential. It is important to note that quality attracts a certain cost and it is expected to reflect in building project by providing or making available the necessary or sufficient fund needed to actualize it. The extent of cash flow in the building construction has an influence on the level of quality reflected at the completion of building project. Therefore, the availability of fund determines the quality scope that will be allowed to reflect in building construction. Newton & Christian (2006) looked at quantifying quality from a building life cycle cost perspective, taking into consideration the effects of quality design, materials used and workmanship. Owner criteria, design, and construction itself also influences cost of quality in a building project. Poor quality operation and maintenance decisions made by professional team or facility management team will also likely result in more expensive repair costs down the road. Hence, cost of quality is a factor that influences the use of quality performance indicator in order to achieve the desired quality of a building project.

Inspection and testing of executed works are ways or measures put in place to inspect quality of a project. It is an act of supervising the professionals or construction firm to provide the quality needed for a building project.

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The construction firm in turn get approval or report for all tested materials used to validate their strength, standard and quality. Hanson and Mbachu (2006) reported that shoddy job, disputes and contractor's lack of capacity were part of the factors that could impact negatively on project delivery. Inspection and testing of executed works will help contractors or contracting firms to procure quality materials in meeting design specifications, ensuring sustainability of design and actual construction and building the right attitude in workers towards quality service delivery. Adenuga (2013) believed every party to projects has suitable roles to perform if quality service delivery must be attained. Joshua, Olusola, Ogunde, Amusan, Ede & Tunji-Olayeni (2017) maintained that lack of knowledge on application of cement are responsible for low standard of concrete produced on site. On the other hands, Sholanke, Fagbenle, Aderonmu & Ajagbe (2015) established the fact that the problem affecting operatives service delivery have to do with construction process and materials procurement; they maintained that the application of low quality of building materials and poor design contributed to building collapse being experienced from time to time in developing nations. Quality performance indicators serves as a watch guard against the use of less substandard materials which will give building project the possibility of a safer working environment, high quality jobs and satisfaction, thereby leaving the professional with little situations to deal with on site.

Least ranked factors include, culture of organization or people and low tendency to teamwork ranked 24th with mean score of 3.57 each, and low quality drawing and specification ranked 26th with mean score of 3.56. Though they seem insignificant as they are ranked low, yet they are among the factors that sprout out the desires for the use of quality performance indicators in achieving quality. Organization culture is a standard that all workers must comply with in attaining quality. It is the watch word of an organization which all work-force must comply with.

However, unavailability of resources needed to drive the quality notion determines the level of adherence or how far the workers can go in complying with the culture of the organization. Culture tends to emerge as organizations discovers, invests or develops solution to quality problems that it confronts. Therefore successful patterns or approaches used in solving quality challenge tends to form cultures of organization and are used whenever they face similar challenges or problem during construction.

Projects are divided into smaller tasks and these tasks are assigned to specialists, architects, builders, engineers, contractors, subcontractors, and suppliers. No matter how small a project is, no one person has the ability to design, construct and commission all by himself. In team work, all workers and professionals must be committed to their assigned tasks or responsibilities and also motivated in order to achieve quality. The team is usually made up of owners' representative, design firm and constructor depending on the contractual agreements. The project team will see to their responsibility and relating each other works in a fitting position to achieve quality in a building project.

All project inevitably has some changes and unforeseen circumstances that must be resolved during construction period. Part of such rising issues are changes that could occur to specification and designs document. Each project is unique on its own and this will form the selection of design firm for building which can contribute to the quality of the project. Here, we take into consideration the design firm experience, capabilities, expertise and financial stability. This has brought about the development of quality programs, information technologies and database systems which are explored to increase efficiency in the design process. Constructability also affects the quality of design. The quality of drawing and specification is seen in the ability of constructors or builders to establish what is on paper to the ground effectively.

Table 2: Factors that influence the use of quality performance indicators in the delivery of building project in Lagos State

Descriptive Statistics				
	N	**Mean**	**Std. Deviation**	**Rank**
Cost of quality or financial involvement	**100**	**4.46**	**0.6100**	**1st**

Inspection and testing of executed works	**100**	**4.18**	**0.7572**	**2nd**
Use of less - substandard materials	**100**	**4.12**	**0.9773**	**3rd**
Untimely project delivery	**100**	**4.11**	**0.8275**	**4th**
Non enforcement of statutory requirement (Building standard)	**100**	**3.99**	**0.7977**	**5th**
Lack of effective planning	**100**	**3.95**	**0.9031**	**6th**
Design complexity	**100**	**3.95**	**0.7703**	**7th**
Inadequate experience and incompetence of contractor	**100**	**3.95**	**0.8689**	**7th**
Inadequate emphasis on quality	**100**	**3.94**	**0.8969**	**9th**
Strong leadership drive/ Management commitment	**100**	**3.92**	**0.9814**	**10th**
Lack of contractor supervision	**100**	**3.87**	**1.0016**	**11th**
Non Compliance to Government Policies(quality standards)	**100**	**3.87**	**0.9173**	**11th**
PC s identified in contract document	**100**	**3.86**	**0.9642**	**13th**
Adequate quality training/Knowledge	**100**	**3.85**	**0.9143**	**14th**
Unavailability of right equipment for construction	**100**	**3.84**	**0.8958**	**15th**
Good or Poor Communication	**100**	**3.81**	**1.0702**	**16th**
Readiness to prioritize quality above profit	**100**	**3.79**	**0.9979**	**17th**
Lack of training for quality control staff	**100**	**3.77**	**0.9519**	**18th**
Disagreement among Professionals leading to litigations	**100**	**3.70**	**1.0299**	**19th**
Low effective project management system	**100**	**3.68**	**0.9937**	**20th**
Project environment	**100**	**3.62**	**0.8851**	**21st**
Acceptance or resistance to change	**100**	**3.59**	**0.8299**	**22nd**
Lack of motivation	**100**	**3.59**	**1.0357**	**23rd**
Culture of organization or people	**100**	**3.57**	**0.9771**	**24th**
Low tendency to teamwork	**100**	**3.57**	**0.9873**	**24th**
Low quality drawing and specification	**100**	**3.56**	**0.9777**	**26th**
AVERAGE MEAN	**100**	**3.85**	**0.916**	

From the result in Table 3 shows the suitability of the data for factor analysis at a significant value of 0.000 ($p<0.05$) using the Kaiser – Meyer Olkin (KMO) measure of sampling adequacy of 0.875 for the factors influencing the use of the existing quality performance indicators. Tabachnick & Fidell (2013) recommended

0.60 as minimum requirement, of which the KMO value of 0.875 obtained in this case is above the recommended minimum requirement and thus describes how adequate the constructs are.

Table 3: KMO and Bartlett's Test for the factors influencing the use of the quality performance indicators by the professionals in the delivery of building project in Lagos State

KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.875
Bartlett's Test of Sphericity	Approx. Chi-Square	1798.859
	Df	325
	Sig.	.000

Table 4 specified the Rotated Component Matrix for the factors influencing the use of the quality performance indicators by the professionals in the delivery of building construction project in Lagos State. The table accounts for factor loadings of Twenty-six (26) variables factored into five (5) components using Principal Component Analysis extraction method.

The five newly arranged constructs stills retains the characteristics as described by Hamad et al (2021), Shayan et al (2022), He et al (2021) and collaborated by other researchers.

The five components as extracted in Table 5 were named accordingly, the first component was named **Project Quality Factor** with Thirteen (13) loading items of high loading values ranging from 0.838-0.591. Hamad et al (2021) stated that quality factors in projects is the most critical with determining the success and performance of construction projects. Aliyu et al (2015) stated that the success of any building project rest on selection of adequate quality factors and non-adherence to project quality factors is a problem to the successful delivery of a building project. Items loading under this component include Inadequate emphasis on quality, Lack of training for quality control staff, Low tendency to teamwork, Low quality drawing and specification, Low effective project management system, Unavailability of right equipment for construction, Poor compliance to specification as identified in contract document, Inadequate experience and incompetence of contractor, Lack of contractor supervision, Lack of motivation, Lack of effective planning, Acceptance or resistance to change, Non enforcement of statutory requirement (Building standard). Following the above ranking all this component relatively have a mean value greater than 3.85 which shows that achieving quality is hinge on this quality factors and professionals should takes this project quality factors as topmost priority.

The second component was named **Workforce-related factor** with Five (5) loading items; the loading values were high and ranged between 0.797 and 0.563. According to He et al. (2021) workforce related factor has a lot to do with responsibility taken in ensuring that quality of building project is achieved. Work related factors such as Inspection and testing of executed works (ranked 2nd), Readiness to prioritize quality above profit, Strong leadership drive/ Management commitment, Adequate quality training/Knowledge, Culture of organization or people all having a mean value above the average mean of 3.85 in the above ranking. Human factors with respect to operational personnel is a leading factors that affect the quality of construction projects, and is also a core factors in the quality assurance system.

The third component was named **Project Delivery factor** with four (4) loading items; the loading values were high and ranged between 0.777 and 0.600. Items loading under this component included Untimely project delivery, Good or Poor Communication, Non Compliance to Government Policies (quality standards), Cost of quality or financial involvement, all ranked 4th, 16th, 11th and 1st respectively with a mean value all greater than the average mean of 3.85. This also shows that professionals see these factors in this construct as important factors that influence the use of quality performance indicators and are dimmed necessary if quality will be achieved. Project needs to be delivered in time and within budget. Timely completion to the satisfaction of stakeholders is a crucial factor in construction project. Good or poor communication is a critical success factor

in construction project delivery. Many conflicts between the project stakeholders are associated with the information flow throughout the project life cycle and proper coordination. According to Abdul-Rahman et al., (2009) Payment delay entails failure to pay within the timeframe period by any of the stakeholders involved in the project life cycle while other financial challenges such as poor cash flow management, insufficient financial resources and instability of financial markets all contribute to achieving quality in construction projects.

The fourth component was named **Risk related factor** with two (2) loading items; the loading values were high and ranged between 0.67 and 0.777. Items loading under this component included Disagreement among Professionals leading to litigations, Project environment.

According to Shayen et al. (2022) two key factors for risk management in ensuring quality is achieved in building project are organizational factors and human behavioral factors. Shayen et al (2022) stated that inability to handle risk in a project stem from factors such as organizational culture project management capacity, organizational strategy, availability of resources, knowledge and experience and collaboration among project parties and it will eventually cause disagreement among professionals leading to litigation and hence a poor working project environment will be created. Ranking above shows that the two constructs have a mean value lesser than the average mean which shows that professionals did not really consider it as a critical factor that inhibit quality performance in construction project but its importance contributes greatly to achieving quality.

The fifth component was named **Resource related factor** with two (2) loading items; the loading values were high and ranged between 0.559 and 0.541. Items loading under this component included Use of less - substantial materials and Design complexity and which were ranked 3rd and 7th with mean value greater than the average mean of 3.85.This shows that professional are well aware of the importance of this factors that influences the use of quality performance indicators. Resource related factors are most times within the control of the site-manager, hence he/she has the ability to ensure the availability of resources or to make changes up front in order to achieve quality. By changing the plans up front, he/she ensures that all resources are available for all scheduled activities hence eliminating the use of less substandard materials. According to Lindhard et al (2022), Resource related factors are factors related to resource availability, for instance labor or material and his study stated a high consistency between the resource factors external conditions, connecting activities, work force, and construction design.

Table 4: Rotated Component Matrix for the factors influencing the use of the quality performance indicators by the professionals in the delivery of building project

Factors	**1**	**2**	**3**	**4**	**5**
Project quality factor					
Inadequate emphasis on quality	.838				
Lack of training for quality control staff	.815				
Low tendency to teamwork	.810				
Low quality drawing and specification	.790				
Low effective project management system	.777				
Unavailability of right equipment for construction	.772				
Poor compliance to specification as identified in contract document	.762				
Inadequate experience and incompetence of contractor	.748				
Lack of contractor supervision	.746				

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Lack of motivation	.741				
Lack of effective planning	.702				
Acceptance or resistance to change	.674				
Non enforcement of statutory requirement (Building standard)	.591				
Workforce related factor					
Inspection and testing of executed works		.797			
Readiness to prioritize quality above profit		.728			
Strong leadership drive/ Management commitment		.644			
Adequate quality training/Knowledge		.629			
Culture of organization or people		.563			
Project delivery factor					
Untimely project delivery			.777		
Good or Poor Communication			.752		
Non Compliance to Government Policies (quality standards)			.638		
Cost of quality or financial involvement			.600		
Risk related factor					
Disagreement among Professionals leading to litigations				0.67	
Project environment				0.777	
Resource related factor					
Use of less - substantial materials					0.559
Design complexity					0.541
%Variances	42.276	10.063	6.789	4.601	4.225
Initial Eugen values	10.992	2.616	1.765	1.196	1.098

CONCLUSION AND RECOMMENDATION

The main aim of assessing factors that influences the use of quality performance indicators was to deliver building construction project of high quality which are cost effective through exploratory factor analysis, classifying the quality performance indicators for ease of implementation and to rate their level of importance by the professionals. While there are several factors that influences the use of quality performance indicators, Cost of quality, Inspection and testing of executed works, Use of less-substandard materials, Untimely project delivery and Non-enforcement of statuary requirement were the most recognized among others by the professionals. However, factor analysis carried out classified all these factors into Project quality factors, Workforce related factors, Project Delivery factors, Risk related factors and Resource related factors; indicating

which factors were ranked low yet serves as a crucial aspect in construction, if quality of projects will be achieved. It is not enough to have quality performance indicators highlighted in construction industry but also necessary to see to their importance, implementation and compliance of in building construction project.

On the basis of findings of the study, it is recommended that the construction industry should encourage and take seriously or place in high consideration, Cost of quality, Inspection and testing of executed works, Use of less-substandard materials, Untimely project delivery and Non-enforcement of statuary requirement as factors that will increase quality achievement while recognizing items listed under project quality factors, workforce related factors, project delivery factors, risk related factors and resource related factors as a key classification necessary to enhance project delivery in construction industry in Lagos State.

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