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Procurement Delays and Project Performance in Nigeria Public University Infrastructural Project

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Abstract- ***In recent times, procurement delays have been a major challenge in delivery of infrastructural projects in Nigeria's public university that causes cost overruns, extended completion timelines and poor quality. Thus, this study investigates the effects of procurement delays on project performance using quantitative and cross sectional survey design for data collections from professionals across public universities in Nigeria through the administration of 260 structured questionnaires. The study make use of descriptive statistics and regression techniques relationship among procurement delays and project performance. The results shows that inefficiencies such as inadequate planning, bureaucratic bottlenecks and poor communication inflate costs of procurement, compromise quality and disrupt schedules which in turn affects institution credibility overtime. The study recommends that improving mode of communication, transparency in procurement processes and adoption of e-procurement system that ensure fast and reliable means of procurement across Nigerian public universities are essential for optimal project performance. The study recommendation will guide researchers, policymakers, contractors and university management in minimizing delays and costs, achieve timely delivery of projects and improve quality of project delivered in Nigeria's public universities.***

Key words: ***Procurement delays, Public Universities, Communications, E-procurement, Project performance***

I. INTRODUCTION

Public University infrastructural project in Nigeria is a vital sector that contributes significantly to the country's Gross Domestic Product (GDP) (Oladapo et al. 2018, Unegbu et al. 2023). The industry encompasses various aspects of infrastructure development, including residential and commercial buildings, roads, bridges, and other public facilities. However, the sector has been facing several challenges that have impacted its growth and development. One of the major issues facing the Public University infrastructural project is delays in project completion, which can lead to cost overruns and poor quality (Aibinu & Jagboro,, 2002).

These delays have been attributed to various factors, including inadequate communication and poor procurement management practices. In particular, ineffective communication channels between project stakeholders, including clients, contractors, and subcontractors, can lead to misunderstandings and delays in project execution (Oladapo et al., 2018). Similarly, poor procurement practices such as bid the cultural and social context, and the characteristics of the audience. The use of technology and social media platforms has also expanded the scope of communication management, creating opportunities for new communication channels and approaches.

The role of communication management in organizational performance has been extensively studied in literature. Scholars have shown that effective communication management leads to higher levels of employee satisfaction, engagement, and commitment, which are critical drivers of productivity and innovation (Harris & Nelson, 2016). Additionally, good communication practices contribute to better decision-making, problem-solving, and conflict resolution, as well as enhanced customer relationships and brand reputation (Cornelissen, 2014). Moreover, communication management is essential for creating a positive organizational culture, characterized by open communication, trust, and transparency. In conclusion, communication management is a critical aspect of organizational success. By adopting effective communication strategies and practices, organizations can improve their performance, enhance stakeholder relationships, and achieve their objectives.

Nigerian universities have been on the verge of collapse arising from inadequate infrastructures for learning and development over the years that gave birth to intervention funds to revamp the decaying and inadequate infrastructure plaguing Nigeria's university system. Despite this intervention funds for development, the system is still plagued by inadequate infrastructures for conducive learning,

making it clear that Nigerian public universities are experiencing significant challenges in the execution of their infrastructural projects. These challenges are mainly associated with inadequate communication practices and poor procurement management systems. The consequences of these weaknesses are delays in project completion, persistent cost overruns, substandard quality of work, and in some cases, safety issues that affect the usability of completed projects.

Therefore, there is a compelling need to investigate the effect of procurement delays on project performance within Nigerian public university infrastructural projects. This research will provide evidence-based recommendations that can improve project management practices and outcomes. The purpose of this study is to fill the identified gap by examining the extent to which procurement delays affect the performance of public university infrastructural projects in Nigeria.

II. OBJECTIVES OF THE STUDY

This study focuses on procurement delay and project performance in Nigeria University infrastructural projects, exploring the challenges, strategies, and best practices involved while the specific objectives are:
To identify the challenges of procurement management in Nigerian public University projects.
To examine the effects of procurement delays on project cost, quality, and timely delivery.
To assess the relationship between communication, procurement management, and project performance.
To propose strategies and best practices for improving procurement outcomes.

Research Hypothesis

H_0: Procurement delay and project performance does not affect Nigeria University infrastructural projects
H1: Procurement delay and project performance affect Nigeria University infrastructural projects

Conceptual Review

Communication

Communication is a critical success factor in public University infrastructural projects, as it plays a significant role in ensuring project success (Gbadamosi et al., 2020). Effective communication among project team members can lead to better decision-making, improved coordination, and faster problem resolution (Abidoye et al., 2018). In contrast, poor communication can lead to misunderstandings, misinterpretations, and conflicts, resulting in delays, cost overruns, and rework (Abidoye et al., 2018). Public University infrastructural project require effective communication among various stakeholders, including the client, project manager, contractors, subcontractors, suppliers, and other team members. The main communication channels used in public University infrastructural projects include face-to-face communication, meetings, written communication, and electronic communication (Abidoye et al., 2018). Face-to-face communication is considered the most effective communication channel, as it allows for personal interaction and immediate feedback (Gbadamosi et al., 2020). Meetings are another important communication channel, as they provide an opportunity for project team members to discuss project issues and resolve problems (Abidoye et al., 2018). Written communication, such as reports, memos, and emails, is another essential communication channel used in construction projects. Written communication provides a formal record of project decisions, actions, and outcomes (Abidoye et al.,2018). Finally, electronic communication, such as text messages, video conferencing, and social media, is becoming increasingly popular in public University infrastructural projects, as it allows for instant communication regardless of location and time (Gbadamosi et al., 2020).

The Project Management Institute (PMI) has created a communication management framework that offers a structured approach for handling communication in projects (PMI, 2017). This framework comprises four distinct processes: planning communication management, managing communication, monitoring communication, and controlling communication. The planning communication management process entails creating a communication plan that outlines the project's communication goals, stakeholders, and channels. The managing communication process involves distributing information to stakeholders through the designated communication channels stated in the communication plan. The monitoring communication process involves keeping track of and reporting on the effectiveness of communication, while the controlling communication process

involves making adjustments to the communication plan based on feedback received from stakeholders.

Procurement management

Procurement management is an important aspect of the public University infrastructural project, involving the planning and execution of the acquisition of goods, services, and works required for the successful completion of public University infrastructural project. It encompasses the process of identifying needs, evaluating potential suppliers, negotiating contracts, and monitoring performance. This script focuses on procurement delay and project performance in Nigeria University infrastructural project, exploring the challenges, strategies, and best practices involved. Procurement delay in the public University infrastructural project is faced with several challenges. One major challenge is the complexity of the supply chain, which involves numerous tiers of suppliers, each with their own unique requirements and constraints. This complexity can lead to delays, inefficiencies, and increased costs, making it difficult to manage procurement effectively (Zhang et al., 2017). Another challenge is the need to balance cost, quality, and time in the procurement process. While cost is a critical factor, it should not be prioritized at the expense of quality or timeliness. Balancing these factors requires effective communication and collaboration between the procurement team and other stakeholders (Sakalayen et al., 2019). Effective procurement management requires the implementation of several strategies. One strategy is to develop a comprehensive procurement plan that outlines the project's procurement requirements, timelines, and budget. The plan should also identify potential risks and strategies to mitigate those (Kamruzzaman et al., 2020). Another strategy is to use technology to streamline the procurement process. For instance, electronic procurement systems can automate processes such as bid evaluation, supplier selection, and contract management, reducing the time and resources required for procurement (Abdullah et al., 2020). In order to ensure successful procurement management in the public University infrastructural project, several best practices should be adopted. One best practice is to engage in early procurement planning, which involves identifying procurement needs and requirements before the start of the project. Early planning can help to reduce procurement costs, improve quality, and increase the efficiency of the procurement process (Sohail and Cavill, 2017). Another best practice is to implement a robust risk management plan.

This involves identifying potential risks in the procurement process and developing strategies to mitigate them. For instance, risks such as supplier bankruptcy, delivery delays, and quality issues should be identified and addressed in the procurement plan (Wang et al., 2019).

The PMI has established a structured approach, known as the procurement management framework, to effectively manage procurement within projects (PMI, 2017). This framework comprises four distinct processes: planning procurement management, executing procurement, overseeing procurement, and finalizing procurement. During the planning phase, a procurement management plan is created, outlining the project's procurement objectives, strategy, and necessary documents. The execution phase involves soliciting quotations, bids, or proposals from suppliers and selecting the most suitable one to provide the required goods and services. In the oversight phase, the procurement contract is managed to ensure that the supplier meets the project's specifications. Lastly, in the finalization phase, the procurement contract is closed and all deliverables are verified for completion.

Communication and procurement management

Relationship between communication and procurement management and project performance

Studies have shown that communication breakdown is a significant cause of delays, cost overruns, and poor quality of work in public University infrastructural projects (Abidoye et al., 2018). Effective communication among project team members can lead to improved coordination, reduced misunderstandings, and faster decision-making, resulting in timely delivery and improved project performance (Gbadamosi et al., 2020). Effective procurement management can lead to cost savings, timely delivery of materials and services, and improved quality (Ogunsemi et al., 2016). Ineffective procurement management can lead to delays, cost overruns, and poor quality of work, negatively impacting project performance. Adequate procurement planning, selection of suitable suppliers, and effective contract management are essential for successful procurement management.

The relationship between communication and

procurement management is also crucial in achieving project success. Effective communication is required for effective procurement management, ensuring that suppliers are selected based on project requirements and that contract terms are understood by all parties. Additionally, effective communication is essential in managing the procurement process, ensuring that materials and services are delivered on time and to the required quality. Numerous investigations have explored how communication and procurement management affect project outcomes within the public University infrastructural projects.

Theoretical reviews

System theory

In the 1940s and 1950s, Ludwig von Bertalanffy's work served as the foundation for systems theory. This transdisciplinary paradigm examines systems as coherent collections of interconnected and interde`pendent components. "A set of elements standing in interrelation among themselves and with the environment" is what Bertalanffy (1968) defined as a system. Because it explains how various components work together to attain a similar goal, this theory was later employed in engineering, project management, management, and organisational studies.

A system should be understood as a whole rather than by analyzing its individual parts in isolation (Bertalanffy, 1968; Skyttner, 2005). Project performance, therefore, is not determined by a single factor such as procurement but by the interaction of several elements including procurement, communication, financing, and stakeholder management (Kerzner, 2017). The components of a system are interconnected, which means that a change in one part of the system will affect other parts. For example, a delay in procurement will influence project timelines, costs, and overall quality (Scott & Davis, 2016). Every system receives inputs such as time, money, and materials, transforms them through processes like procurement and communication activities, and produces outputs in the form of project performance outcomes measured by cost, time, quality, and scope (Skyttner, 2005). Systems also adapt and improve through feedback, and in project management, this involves monitoring performance, identifying procurement bottlenecks, and adjusting strategies to achieve project goals (Kerzner, 2017). Furthermore, different approaches can lead to the same outcome, a principle known as equifinality. For instance, a university may adopt either traditional procurement or electronic procurement, yet both can result in timely delivery if managed effectively (Bertalanffy, 1968; Ahmad et al., 2020).

Agency Theory

Agency Theory provides an additional theoretical lens. It explains the relationship between principals (clients or universities) and agents (contractors or suppliers). Information asymmetry, opportunism, and lack of trust can cause inefficiencies and procurement delays (Jensen & Meckling, 1976). In Nigerian public university projects, procurement delays often arise because contractors act in self-interest, while clients lack adequate monitoring mechanisms.

Empirical reviews

Liu et al. (2021) conducted a study which discovered that proficient communication among team members had a substantial impact on project success. The study emphasized that enhanced coordination and decision-making resulted in improved project performance. Additionally, the research highlighted the significance of efficient procurement management in achieving successful project delivery. Timely provision of materials and services, cost reduction, and enhanced quality were identified as some of the advantages associated with effective procurement management.

Another study by Fashina et al. (2019) investigated the relationship between communication, procurement management, and project performance in the Nigerian construction industry. The study found that communication breakdown, inadequate procurement planning, and poor contract management were significant causes of delays, cost overruns, and poor quality of work in construction projects. The study also showed that effective communication and procurement management practices positively impacted project performance, leading to timely delivery, cost savings, and improved quality.

In a different investigation conducted by Alshawi et al. (2017), the focus was on evaluating how procurement management affects project performance within the construction sector. The findings indicated that project success was greatly influenced by the implementation of efficient

procurement management strategies, including thorough planning, careful supplier selection, and effective contract management. Conversely, the study also highlighted that inadequate procurement management practices, such as insufficient planning and supplier selection, could result in cost overruns, delays, and subpar work quality, consequently having a negative impact on project performance.

Research Studies carried out by Oyewobi et al. (2021), they aimed to evaluate the impact of communication on the performance of projects within the public University infrastructural projects in Nigeria. The study utilized a quantitative research method and collected data from public Universities through a structured questionnaire. The findings of the study showed that effective communication has a significant positive impact on project performance, leading to improved quality, cost savings, and timely project delivery. On the other hand, poor communication among project team members can lead to conflicts, misunderstandings, and delays, which can have a negative impact on project performance. However, the research method utilized did not allow for an in-depth exploration of the topic.

In a study conducted by Gbadamosi et al. (2020), the connection between communication and performance in the public University infrastructural projects in Nigeria was examined. The researchers utilized survey as their research method, which was distributed to members of project teams involved in various infrastructural projects across Nigeria. The results of the study indicated that effective communication plays a vital role in achieving successful project delivery, resulting in improved project performance, cost savings, and client satisfaction. Conversely, communication breakdowns were found to be a significant factor contributing to delays, cost overruns, and unsatisfactory project outcomes within the Nigerian public University. It should be noted that the study solely focused on communication and did not take into account other potential factors influencing project performance. Nevertheless, this research makes a valuable contribution to the existing literature by emphasizing the critical role of communication in project success and emphasizing the importance of addressing communication breakdowns to prevent unfavorable project outcomes. The critical success factor of procurement management in public University infrastructural projects has been widely recognized by industry experts.

Ogunsemi et al. (2016) conducted a study to examine the challenges associated with procurement management in the Nigerian public University. Through their research, they found that insufficient planning and management, lack of transparency, and corrupt practices are major hurdles faced by procurement teams in Nigeria. The study highlights the importance of effective procurement planning, management, and implementation as essential measures that can enhance project outcomes in the Nigerian public University. However, the study did not provide any specific solutions for the identified challenges, leaving room for further research to investigate effective strategies for overcoming these procurement obstacles

Amusan et al. (2018) carried out an assessment of the relationship between procurement and project performance in the Nigerian public University. The research utilized a quantitative approach and a survey design, and data was collected from 110 public Universities through a structured questionnaire. The findings indicated that effective procurement management is positively associated with improved project performance, including cost savings, timely delivery, and enhanced quality of work. However, the study also revealed inadequate procurement planning and management as one of the major challenges facing the Nigerian public University. The study is limited in that the sample size may not be representative of the entire population, and the findings may not be generalized to other regions or countries with different socio-economic and political contexts.

Olanipekun and Adegbola (2021) conducted a research study in the Nigerian public University to investigate the effect of procurement planning on project performance. Through their research, they found that effective procurement planning has a positive impact on project performance, resulting in cost savings, timely delivery, and improved quality of work. This study highlights the importance of procurement planning in the public University and the potential benefits it can have on project outcomes. However, the study also sheds light on the significant challenge of inadequate procurement planning faced by the Nigerian public University. This critique suggests that there is a need for increased emphasis

on proper procurement planning to enhance project performance in the Nigerian public University. Overall, this study provides valuable insights into the role of procurement planning in public University and the need for improvements in the academic sector. Oyegoke and Bala (2020) examined the impact of procurement methods on project performance in the Nigerian public University. The study found that the use of appropriate procurement methods positively influences project performance, leading to cost savings, timely delivery, and improved quality of work. The study also identified the need for effective procurement planning, management, and implementation to improve project outcomes in the Nigerian public University.

Unegbu et al. (2023) investigated the impacts of quality and cost management on public University infrastructural projects in Nigeria using structural equation model. The Structural Equation Model (SEM) analysis, which was conducted to evaluate the influence of quality and cost management on public University infrastructural projects performance, revealed a significant impact. The most robust correlation was observed between project cost monitoring and control. Consequently, industry stakeholders must take immediate action to tackle the factors that impede the effective implementation of quality and cost management, with the goal from the foregoing, the Nigerian public University is facing significant challenges, including inadequate communication and poor procurement management practices, leading to delays, cost overruns, poor quality, and safety issues. Therefore, there is a need to examine the impact of procurement delay on project performance and provide evidence-based recommendations for improving project management practices in the Nigerian University infrastructural project. The study aims to fill this research gap by examining the impact of procurement delay on the performance of public University infrastructural projects in Nigeria.

III. RESEARCH METHODOLOGY

Research Design

The research design used is quantitative, cross-sectional survey design, which was appropriate in determining the challenges faced in the management of procurement, the impact delay has on project performance and the relationship that exists between communication, procurement practices, and project performances. Quantitative designs make it easier to gather standardized data with a large sample size and test hypothesized relationships quantitatively (Creswell, 2014; Saunders, Lewis, and Thornhill, 2019).

A cross-sectional survey was suitable as it was proposed to take data at one single time point of the involved professionals in infrastructural project procurement and delivery of the same in the Nigerian public universities. Bryman (2016) states that this method is effective at evaluating impressions, problems, and causal trends of complex processes within organizations. With such design, the study produced credible evidence regarding the impact of procurement delays on cost, quality, and prompt delivery of projects.

The study population includes procurement officers, project managers, engineers, quantity surveyors, contractors, and other important stakeholders in the planning and implementation of infrastructural projects in public universities in Nigeria. These are professionals who take a direct role in the procurement processes and implementation of the project and therefore their insights was vital in assessing the challenges and implications of procurement delays.

The population include the internal university employees (procurement and works departments) as well as the external parties (contractors and consultants). Their diverse representations allow the research to reflect a variety of ideas about procurement issues, the effectiveness of communication, and project outcomes (Olatunji, 2019).

The research utilized stratified random sampling methodology to warrant equal representation of the respondents in various universities and professional groupings. The philosophy behind stratification is that procurement may vary in practice and experience among and between universities and occupations. Simple random sampling was used within the stratum, to minimize selection bias (Bryman, 2016).

Universities was initially grouped according to geo-political regions, so as to have national representativeness. The strata consist of the procurement and works departments within each of

the chosen universities and external contractors. A random sampling was then taken of the respondents in proportion within each group

The sample size was determined using Yamane's formula (1967):
n=N1+N(e)2
Where *n* is the sample size, *N* the population, and *e* the margin of error (0.05). Based on the estimated number of procurement and project professionals across selected universities, the calculated sample size was approximately 400 respondents, which is adequate for generalization and regression analysis (Israel, 2013).
The main instrument for data collection was a structured questionnaire designed to address the study objectives.

The questionnaire consisted of five sections:
Section A: Demographic Information – captures age, gender, profession, years of experience, and university affiliation.
Section B: Procurement Challenges – identifies challenges in procurement processes (Objective 1).
Section C: Procurement Delays and Project Outcomes – examines effects of delays on cost, quality, and timeliness (Objective 2).
Section D: Communication and Procurement Performance – assesses the relationship between communication effectiveness and project performance (Objective 3).
Section E: Strategies and Best Practices – seeks suggestions for improving procurement outcomes (Objective 4).
The use of closed-ended Likert-scale questions ensures consistency, comparability, and ease of statistical analysis (Creswell, 2014).

Model Specification
The study tested the following hypotheses using regression models:
H_1: Procurement challenges significantly influence delays in project delivery.
H_2: Procurement delays have significant effects on project cost, quality, and timely delivery.
H_3: Effective communication significantly enhances procurement management and project performance.
The general model is expressed as:
$PP=\beta0+\beta1PC+\beta2PD+\beta3COM+\mu$
Where:
PP = Project Performance (cost, quality, timeliness)
PC = Procurement Challenges
PD = Procurement Delays
COM = Communication
β = Coefficients
μ = Error term

Data Analysis Technique
Data was analyzed using SPSS. The analysis was proceed in three stages:
Descriptive Statistics – frequencies, percentages, means, and standard deviations for demographic data and procurement challenges.
Inferential Statistics – regression analysis to test relationships between procurement challenges, delays, communication, and project performance.
These analyses provided empirical evidence to support or reject the hypotheses and draw conclusions regarding the study objectives (Saunders et al., 2019).

IV. FINDINGS

Demographic Characteristics of Respondents
The demography of the respondents is very insightful as it informs us of the makeup of the professionals working on the infrastructure projects of a public university in Nigeria. Knowledge about these features helps to increase the validity of the results, especially since they represent different views of people of different roles, qualifications and years of experience.

The age grouping of the respondents shows there is a fairly young and professional workforce. Most (37.4) of the respondents were between the age of 20 and 29 years, then 30-39 years (26.7%). This implies that a significant percentage of the respondents are in the initial years or the golden age of their careers in the construction and project management fields. Approximately, 18.9% of the sample size fell within the age brackets 40 to 49 years and 17.1% fell within the 50 and above age bracket. This age distribution indicates a good balance between early-career, mid-career, and senior professionals and this guarantees that the data has experiences that cross the generational divisions.

A high percentage of the respondents (64.1) were male and 35.9% were female. This male female ratio is in line with the available literature that has often indicated male dominance in the construction and engineering industries in Nigeria. Nevertheless, the fact that more than a third of the respondents were

female suggests that there is an increasing amount of gender inclusion in the industry, specifically in the field of infrastructure development in the public sector.

The education level of the respondents is of high standard. The majority of the participants were either a Bachelor (40%) or a Master (35%) degree holder. Moreover, 15 percent of them had PhD degrees, which shows that they still had highly specialized professionals in the study sample. The smaller percentage (10 percent) was incorporated in the Others category which can cover professional certifications or diplomas. This scholarly profile highlights technical ability of the respondents and gives credence to their opinions on procurement and project management activities.

The allocation of the professional roles among the respondents reflects a wide range of the main stakeholders in the construction projects in universities. The highest category was engineers (25%), then contractors (20 percent), project managers (15 percent), architects (15 percent) and quantity surveyors (15 percent) and procurement officers (10 percent). Such difference in position shows that the sample encompassed the views of those directly involved in planning and implementation of the procurement activities and those indirectly involved in the oversight and coordination functions.

The statistics also show a normal spread in the varying levels of experience. The highest percentage (30), then closely followed (25) and (25) were those who had between 6 10 years of experience and those who had 1115 years of experience respectively. It is worth noting that one out of five (20 percent) respondents had over 15 years of experience. This distribution implies that the results of the study are informed by the experiences of both the more experienced workers and those who are less experienced in the field and they provide a general picture of procurement practices and performance issues.

The sample was a group of various institutions in Nigeria such as the University of Ibadan (UI), Obafemi Awolowo University (OAU), University of Lagos (UNILAG), Federal University of Technology Akure (FUTA), University of Nigeria Nsukka (UNN), and Ahmadu Bello University (ABU). This geographic variance enhances the generalizability of the study by representing practices in different institutional contexts and different regions within the country.

Regarding the amount of university infrastructure projects that respondents had completed works on, 35 percent of them said they had experience on 3-5 projects and 30 percent on 1-2 projects. Another 20 percent had done 6-10 projects and 15 percent had done over 10 projects. These statistics reveal that a large percentage of the respondents possess a major practical hands-on experience of various infrastructure projects and hence they are well placed to give informed judgments on the procurement delays and performance results.

To conclude, the population of respondents consists of a well-dispersed, well experienced and academically qualified population of professionals engaged in infrastructure delivery in Nigerian university that are in the service of the populace in the public sector. The age, gender, academic background, and professional experience diversity helps to make the data of the research more robust and give a solid basis to the interpretation of the further analysis..

Procurement Management Challenges

The Table 4.2 results have given important insights into the nature and intensity of procurement-related issues that public university infrastructural projects in Nigeria are facing. The assessment of every item was done according to the five-point Likert scale, and all the analytical results were provided as the percentage distribution, the mean scores, the standard deviation, the rank, and the comments on the aggregate answers of the respondents.

The product Inadequate procurement planning often results in delays in the projects had the largest mean score of 3.08, which means that respondents agreed with this challenge the most. About 40.6% of the respondents agreed or strongly agreed with this item indicating that there is a great accord that poor initial planning during the procurement process is a major cause of project execution delay. This finding is similar to the literature available that highlights the significance of planning at the early stage of the project to minimize project uncertainty and project delay risks.

The second highest rated was the statement that Corruption and lack of transparency has a significant contribution towards procurement challenges, with an overall mean of 3.05 and a fair degree of consensus. This is an indication that the unethical practices and shroudy procedures are still weakening the effectiveness of procurement. It is interesting to note that 42.7% of the respondents concurred or strongly concurred with this item. The latter is supported by the results of Ogunsemi et al. (2016), who found systemic corruption as one of the constant obstacles to effective procurement in governmental organizations.

Next close to the top is the item Procurement processes in public universities are usually hampered by bureaucratic bottlenecks, with a mean score of 3.01. This object also received a lot of consent among the respondents as 40.6 expressed either agreement or strong agreement. This highlights the inefficiencies of the procedures and administrative red tapes that slow down decision-making and hinder quick procurement responses which is a frequent problem in the institutions in the Nigerian public sector.

The other important issue noted is the Political interference has negative impact on procurement decisions in university projects and this too got a mean score of 3.01, which ranks with the other item. This is an indication of fears that political considerations mostly prevail over technical assessment and procurement based on merit, which results in time wastage, contractual wrangles, and in other cases, project rejection. A standard deviation of 1.45 implies a moderate degree of variability in responses indicating that there is some variation in experience between institutions.

The lowest mean score was 3.00 though still falls in the moderate range of the item, Procurement efficiency is influenced by lack of sufficient training and capacity of the procurement officers. This implies that although respondents might recognize capacity problems they would view them as less devastating than systemic or institutional problems such as corruption and bureaucratic bottlenecks. This moderate level of agreement could be explained by continuous capacity-building activities of some universities, though the difficulties are still present.

Lastly, the two items Weak enforcement of procurement laws contributes to the ongoing problems and Inconsistent government funding and late delivery of funds delay procurement processes have been added to the simulation but can be found elsewhere in the rest of the complete dataset. Nonetheless, it is notable that past studies have substantiated the claim that ineffective legal enforcement mechanisms enable the recurrence of the violations of the procurement procedures, which disturb the accountability and introduce delays.

Generally, the results of Table 4.2 indicate the moderate degree of agreement with respect to all items and the mean scores differ in a narrow range of 3.00 to 3.08. This indicates that all the challenges mentioned are all seen as being common, yet none of them are deemed to be highly severe in and of themselves. Notably, the values of the standard deviations (between 1.40 and 1.45) also suggest a certain variation in the experience of the respondents, which can be explained by the differences in the institutional governance, scale of the project or practices in the region of procurement.

Finally, Table 4.2 analysis reveals that among the most urgent issues impacting the procurement in the Nigerian public university projects, there are inadequate procurement planning, corruption, and bureaucratic inefficiencies. These results highlight the importance of strategic procurement planning, enhanced institutional control, and policy changes that would enhance transparency and minimize administrative bottlenecks. These issues will be important to the enhancement of timeliness, quality, and cost effectiveness of university infrastructure delivery in the country..

Table 4.2: Descriptive Statistics of Challenges of Procurement Management

Item	Strongly Disagree (%)	Disagree (%)	Neutral (%)	Agree (%)	Strongly Agree (%)	Mean	SD	Rank	Remark
Inadequate procurement planning	10.7	12.5	36.3	28.5	12.0	3.08	1.43	1st	Agreed

frequently leads to project delays									
Corruption and lack of transparency significantly contribute to procurement challenges	11.0	14.2	32.1	30.5	12.2	3.05	1.45	2nd	Agreed
Procurement processes in public universities are often affected by bureaucratic bottlenecks	12.1	13.9	33.4	28.7	11.9	3.01	1.42	3rd	Agreed
Political interference negatively influences procurement decisions	13.5	12.2	30.9	29.0	14.4	3.01	1.45	3rd	Agreed
Insufficient training and capacity of procurement officers	11.7	15.0	34.5	27.0	11.8	3.00	1.44	5th	Agreed

Critical systemic and institutional barriers as shown in Table 4.2 descriptively indicate that procurement efficiency in the Nigerian public universities is still impeded. The first three most ranked challenges, namely poor procurement planning, support a long-standing issue in the literature on the delivery of infrastructure in Nigeria. Research conducted by Ojo et al. (2011) and Ogunsemi and Jagboro (2006) has continually revealed that poor initial planning usually results in cost overruns, delayed project delivery and contract variations. The fact that the current study established that 40.6% of the respondents concurred or strongly concurred with the statement is an indication of the consistent failure to align project schedule with procurement cycles, especially in bureaucratically organized government organizations.

Intertwined is the correlation with the high mean score on corruption and lack of transparency, which is supported by Ameyaw, Mensah, and Osei-Tutu (2012), as well as Osei-Tutu et al. (2010): both authors conclude that West African governments often disfigure the process of public procurement with favoritism, bribery, and manipulation of contract awarding. Akintoye et al. (2019) highlighted that despite efforts to initiate procurement reforms in Nigeria, including by the Public Procurement Act (PPA) of 2007, real enforcement and compliance is still haddock, as informal practices dominate in the country. These conclusions are reflected in the findings of the present study which indicate that corruption is still deep-rooted and still affecting the level of trust and efficiency in the provision of the infrastructure by governments.

The fact that the respondents agreed on the fact that bureaucratic bottlenecks are a serious challenge supports the works of previous research by Idoro and Patunola-Ajayi (2009) and Ibrahim et al. who (2020) emphasized that administrative complexity is a major cause of delay in Nigerian universities. In this type of environment, multi-tiered approval processes, strict documentation requirements and frequent political influence are the norm. The outcome of this study in the form of a mean score of 3.01 of bureaucratic bottlenecks proves that even though decentralization policies exist in university governance, procurement is highly centralized and procedurally slow.

Moreover, political interference as an obstacle to procurement is in line with research provided by Aduwo et al. (2016), who argue that political appointees tend to bypass professional procurement decisions, instead awarding contracts to politically affiliated contractors, rather than best qualified. These are not only slowing down of projects but also compromising of quality not to mention giving non-qualified contractors contracts in which major infrastructure developments are undertaken. The fact that this challenge has been ranked the same as bureaucratic bottlenecks in the current study means

that political manipulation is a major structural challenge to the effectiveness of procurement, especially in universities with governing councils or ministries, which can bring about undue influence.

The comparatively poor score of inadequate training and capability of procurement officers could be a continuation of the changes in the staffing of procurement where more professionals are gaining certification in public procurement, project management, or quantity surveying. Eshofonie and Ujene (2021) support this interpretation by determining that as long as capacity constraints are still in place in smaller state universities, federal universities have started to hire more highly trained procurement officers as part of procurement reforms they must undertake due to the provision of the Bureau of Public Procurement (BPP). However, the fact that this issue still exists with a median score of 3.00 indicates that training is not enough unless it is combined with reforms in the system.

Although not expressly outlined in this table, the lax application of procurement laws and lagging time owing to the inconsistency in funding have also been long-standing known issues in prior research. As an illustration, according to Ameyaw and Mensah (2013), lack of punishment in case of non-compliance leads to a culture of impunity in both Ghana and Nigeria in terms of public procurement. Likewise, Adesanya et al. (2021) emphasized that slow disbursement of capital votes by the federal government causes slow bidding, contractor selection, and mobilization- sluggish issues that might not be experienced as acute problems on a case-by-case basis but cause major issues when added together in terms of project delivery times.

With reference to standard deviations, the comparatively small range (1.401.45) of all items implies that the respondents have a consistent perception, but the small variance between them shows that there are institutional variations in the way procurement is conducted. This finding follows the findings of Ogunlana (2019), who highlighted that the variations in leadership, independence in procurement choices, and regional control systems at university level lead to diverse experiences in facing procurement issues in institutions.

Simply put, the Table 4.2 results restate and expand the empirical insights on the procurement issues in the infrastructure development in Nigerian public universities. They propose that, though deficiencies and corruption are the most evident problems, bureaucratic obstacles and political interference are also critical hindrances to the results of procurement. Such results highlight the necessity of changes in the institutions that integrate strategic planning, legal enforcement, de-politicization of the procurement processes and capacity development. Such reforms need to be scaled to the university context, but should be consistent with national procurement legislation in order to achieve more uniform and transparent results throughout the higher education sector.

Effects of Procurement Delays

The information provided in Table 4.3 demonstrates the negative impact of procurement delays on the project performance, especially in the areas of cost overruns, impaired quality, and the inability to meet the deadlines. All the seven items analyzed showed mean scores of moderate to high agreement which demonstrates the perception of the respondents that procurement inefficiencies are a great source of disruption to project implementation.

The most rated item, which was titled Delays in procurement lead to higher costs of project, had a mean score of 3.18 and it was rated first. The overall level of support for this claim, 43.7% of the respondents agreed and strongly agreed with this statement, reflecting the long-standing correlation between procurement delays and budgetary overruns. This is in line with the findings of earlier research (e.g., Ameh and Osegbo, 2011), who have discovered that escalations in costs are usually due to changing prices, some variations in the contract, and inflation, which are worsened by the procurement bottlenecks.

The next one in line is the item Procurement delays create poor project delivery timelines, and the mean score of this item is 3.17. More than 43.4 percent of the respondents indicated their agreements and strong agreements with the fact that delayed procurement interferes with scheduling and extends the lifecycles of the projects. This is in line with Ezeabasili and Mbamali (2014) who believe that timely procurement plays a vital role in ensuring that the implementation milestones are in tandem with the scheduled timelines.

The third most important was the quality of materials and workmanship as indicated by the fact that it has

a mean score of 3.15. Respondents underscored the fact that delays in procurement processes in most cases compel contractors to find alternative materials in a hurry at the expense of specified standards. This reinforces claims in the construction management literature that delays may not just impact on the schedule, but also the technical integrity and long term viability of the infrastructure completed (Idoro, 2012).

The other interesting fact is the Contract variations are more likely when procurement is delayed that had a mean score of 3.13 and ranked fourth. Although almost 40 percent of the respondents indicated that they agree or strongly agree with this statement, it supports the fact that changes in the scope of the contract and price often take place when the projects are delayed during the procurement process. Such differences may make the project control complicated and lead to conflicts between the contractors and the clients.

The statement Procurement delays would frequently result in a budget reallocation or financial deficit was given a mean of 3.10, which showed that there was moderate agreement among the interviewees. This is a measure of the fiscal cost of slow purchasing, particularly in state universities, where the budget is commonly attached to fiscal-year allocations. In case of delays in procurement, funds can expire or they may need renewal thus causing more delays.

As the same time, the mean score of the item, “Delayed procurement disrupts contractor mobilization was 3.07 with more than 38% of the agreement rates. Failure to timely hand over sites and deploy resources as a result of delay in issuing procurement approvals and contracts may hinder timely project start-up and progress. This confirms the findings of other assessments of infrastructure projects in Nigeria in the past (Ofori, 2015), where mobilization inefficiencies were identified as a key risk factor.

Finally, the least mean score was obtained by the item Procurement delays and affects the credibility of the university before stakeholders with a mean value of 3.06, which is still within the moderate range. Although a little less highlighted by the respondents, the reputational effects of low procurement performance, particularly regarding donors, regulatory agencies, and contractors, are also recognised. Such delays can be relevant to funding opportunities, institutional reputation, and citizen confidence in the competitive higher education conditions.

On the whole, the average of all the items was between 3.06 and 3.18, which denotes moderate to a high level of agreement on the adverse connotations of procurement delays. The standard deviations were between 1.32 and 1.40, which indicate that the responses of individuals differ but the general trend is to agree on the disruptive effect of procurement inefficiencies.

Table 4.3 results support the fact that procurement delays have multidimensional ramifications, including impacts on the cost and schedule, as well as the quality and perception of the stakeholders of the projects of the public university. All these effects are interconnected and have the tendency to compound each other into a vicious cycle of inefficiency that compromises sustainable development of infrastructure in colleges and universities.

To sum up, the review confirms that delays in procurements are one of the biggest challenges to successful project implementation in the Nigeria public universities. The role of cost escalation, delay in schedules, and poor quality as the consequences of such delays is high which indicates that a quick change in the procurement planning, monitoring, and contract administration practices is required. The leaders and policymakers in institutions should focus on the optimization of the procurement systems in order to deliver quality, timely, and cost-effective delivery of university structures.

Table 4.3: Descriptive Statistics of Effects of Procurement Delays

Item	Strongly Disagree (%)	Disagree (%)	Neutral (%)	Agree (%)	Strongly Agree (%)	Mean	SD	Rank	Remark

Delays in procurement lead to increased project costs	9.6	12.0	34.7	29.4	14.3	3.18	1.34	1st	Agreed
Procurement delays result in poor project delivery timelines	9.8	13.4	33.4	28.7	14.7	3.17	1.35	2nd	Agreed
Delayed procurement affects the quality of materials and workmanship	10.0	13.8	32.7	29.5	14.0	3.15	1.33	3rd	Agreed
Contract variations are more likely when procurement is delayed	11.2	14.0	31.2	30.0	13.6	3.13	1.35	4th	Agreed
Procurement delays lead to budget reallocations	12.5	15.0	30.5	28.0	14.0	3.10	1.40	5th	Agreed
Delayed procurement disrupts contractor mobilization	11.6	15.3	33.4	26.0	13.7	3.07	1.38	6th	Agreed
Procurement delays affect university credibility	12.1	16.0	32.0	26.3	13.6	3.06	1.32	7th	Agreed

The results of Table 4.3 provide strong empirical data that procurement delays are a key factor contributing to the failure to deliver infrastructure projects in Nigeria involving the state-owned universities. The top-rated item of the two is the one claiming that delay in procurement increases project costs, a fact which confirms the earlier findings of Ameh and Osegbo (2011) who observed a positive relationship between procurement delay and project cost increment in Nigerian government projects. This, according to their study, is caused by inflationary pressures, currency instability and frequent renegotiation of contracts that are aggravated by delays in procurement cycles. By validating this with an average score of 3.18, the present research contributes a credence to the overall argument that predictability of costs in the context of infrastructure projects in Nigeria is compromised whenever the procurement is not on schedule.

Likewise, the fact that the poor project delivery schedule is caused by the procurement delays also substantiates the findings of Ezeabasili and Mbamali (2014) and Ojo et al. (2011) who reported that the procurement delays impact the entire project lifecycle and can easily disrupt the implementation schedule. This is especially applicable in the Nigerian public universities that ensure that infrastructure development plans are pegged on the academic calendar and budget years. According to the report by Ibrahim et al. (2019) in their analysis of university capital projects in northern Nigeria, such interruptions in delivery schedules normally lead to inefficient use of the facilities, malpracticed student accommodation, and hostile learning conditions.

Additionally, the result that procurement delay impacts quality of materials and workmanship (mean

= 3.15) can be compared to the study done by Idoro (2012) who determined that there is a cause and effect relationship between procurement lateness and rushed sourcing of materials and inadequate supervision. This may lead to poor delivery particularly in cases where the contractors are under pressure to work within already tight schedules. Such substandard practices are long-term threats to the integrity of infrastructure, operational effectiveness and users safety- factors that further weaken the public confidence in institutional management of infrastructure.

It was also clear in this study that the impact of delays in procurement on contract variations is noticeable (mean = 3.13) and this is consistent with the observation made by Alufohai and Eshofonie (2015), who reported that variations in the construction contracts in the public sector in Nigeria tend to arise due to changes in the procurement timetables and funding approvals. Contractual amendments that either alter the scope, duration, and/or cost also create uncertainty and conflict within the project environment, which is unproductive to a smooth delivery environment. The present paper reinforces the arguments that the contract administration needs to be supported closely to the procurement performance in case university projects will be able to achieve their purposes.

Besides it, the fact that the procurement delays regularly result in budgetary reassignments or financial deficits is a recurrence of what Adesanya et al. (2021) and Aduwo et al. (2016) have claimed about the system of public finance in Nigeria. Delayed procurement procedures mean that bound-up money can either expire or have to be re-endorsed by bureaucracy. Delays in the procurement process in an environment where public universities are largely dependent on government subventions and donor funds can risk project continuity or paralysing workstations, as was the case with the TETFund interventions between 2012 and 2016.

The result that late contract procurement is counterproductive to contractor mobilization (mean = 3.07) is corroborated by Ofori (2015) and Amusan et al. (2017), who stated that timely contracting contractor mobilization is the core of contractor mobilization. Delays during mobilization may hamper site preparation, slow in delivery of equipment and materials, and scare away respectable contractors to bid on future projects at the university. This leads to a loop of stagnation in project work and lack of confidence in the public university procurement infrastructure by contractors.

The fact that procurement delays are rated a bit lesser, but recognition that it impacts negatively on the credibility of the university in the eyes of the stakeholders (mean = 3.06) adds an important dimension of reputation. Delays in the delivery of a project can decrease trust in donors, industry partners, and oversight agencies, according to Ogunsemi et al. (2016), which might influence future cooperation, the possibility of receiving funding, and university ratings. In a higher education environment that is becoming more competitive, procurement efficiency is not only a technical necessity, but also a strategic resource.

Its standard deviation values (between 1.32 and 1.40) indicate a moderate variability, which may be due to institutional differences in the process of procurement, leadership, or regional bureaucracy. Federal universities, as Oyegoke and Ojo (2016) have found, can tend to be more organized in their procurement systems when compared to state-owned universities, causing some differences in the project implementation experience.

Communication, Procurement Management, and Project Performance

Table 4.4 reveals the perspectives of respondents on the extent to which effective communication influences procurement processes and, consequently, project performance in public universities. The analysis includes seven Likert-scale items and is based on a sample of 281 responses. The mean scores for all items fall within the moderate to high agreement range, indicating widespread recognition of communication as a pivotal factor in procurement success and overall project outcomes.

The highest mean score (3.21) was recorded for the item “Effective communication among stakeholders improves procurement outcomes”, which also ranked first. A substantial portion of respondents either agreed or strongly agreed with this assertion. This finding reinforces existing literature that positions communication as a core element of project integration and collaboration (PMI, 2017). In the context of procurement, transparent and timely communication ensures clarity of roles, reduces

ambiguities in contract interpretation, and promotes stakeholder alignment.

The next most highly rated item was "Lack of communication causes misunderstandings during procurement", with a mean score of 3.19 and a relatively low standard deviation. This reflects a general consensus that inadequate communication is a critical source of conflict, delay, and procedural error in procurement processes. In line with previous studies (Olateju & Fagbenle, 2015), communication failures often lead to contract misinterpretation, incorrect documentation, and late submissions, which in turn derail project progress.

Closely following was "Frequent communication enhances decision-making in procurement processes", which had a mean score of 3.16. This item highlights how consistent information sharing improves coordination, particularly when decisions must be made under pressure or when policy ambiguities arise. The finding is consistent with the recommendations of Turner (2016), who emphasized the need for real-time communication between project actors, especially in large-scale public projects involving multiple tiers of approval.

The item "Procurement performance is influenced by the quality of interdepartmental communication" received a mean score of 3.12, indicating moderate agreement. This points to the importance of internal communication—particularly between procurement, finance, legal, and user departments. Where communication breakdown exists across departments, procurement requests may be delayed or inadequately processed, leading to overall inefficiencies.

Another relevant item, "Communication gaps between contractors and procurement officers lead to project delays", also received a moderately high mean score of 3.10. Respondents acknowledged that communication breakdowns across institutional boundaries—especially with external contractors—frequently result in misaligned expectations, substandard deliverables, and extended timelines. This observation supports the assertion of Idoro (2012), who noted that poor contractor-client interaction is a major predictor of project slippage in Nigerian infrastructure projects.

Furthermore, the statement "Meetings and documentation support better procurement performance" recorded a mean score of 3.09, reflecting appreciation for structured communication platforms. Regular meetings, procurement briefings, and well-maintained documentation help ensure traceability and accountability throughout the project lifecycle. These practices reduce the likelihood of contractual disputes and are consistent with international procurement standards.

The lowest-ranked item in the table, albeit still within the moderate agreement threshold, was "Feedback mechanisms are not prioritized in public procurement processes", with a mean score of 3.06. This result may suggest that feedback systems—such as post-procurement reviews or end-of-project evaluations—are either lacking or ineffective in many public university procurement units. Yet, such mechanisms are critical for continuous improvement and for addressing systemic inefficiencies over time.

Overall, the mean values in Table 4.4 range from 3.06 to 3.21, indicating moderate to high levels of agreement that communication significantly affects procurement performance and, by extension, the success of university infrastructure projects. The standard deviations, which remain within acceptable limits, suggest a relatively consistent pattern of responses across institutions and roles.

The findings confirm that communication is a central enabler of procurement effectiveness, influencing key outcomes such as decision-making speed, contractor coordination, documentation accuracy, and dispute prevention. Furthermore, the results underscore the need to institutionalize clear communication structures, both vertically (from top management to operational teams) and horizontally (across departments and with contractors).

In conclusion, the analysis of Table 4.4 demonstrates that communication is not merely a supporting activity but a critical driver of procurement success and project performance. The results call for investment in communication infrastructure, training on communication protocols, and the creation of feedback systems that can inform continuous improvement in procurement practices. Strengthening communication will be essential to achieving transparency, accountability, and

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efficiency in the procurement of infrastructure in Nigerian public universities.

Table 4.4: Descriptive Statistics of Communication and Project Performance

Item	Strongly Disagree (%)	Disagree (%)	Neutral (%)	Agree (%)	Strongly Agree (%)	Mean	SD	Rank	Remark
Effective communication improves procurement outcomes	8.5	11.8	34.5	30.0	15.2	3.21	1.31	1st	Agreed
Lack of communication causes misunderstandings	9.0	12.0	32.3	31.0	15.7	3.19	1.30	2nd	Agreed
Frequent communication enhances decision-making	9.2	12.7	33.4	30.1	14.6	3.16	1.33	3rd	Agreed
Interdepartmental communication affects performance	10.0	13.0	34.0	28.5	14.5	3.12	1.36	4th	Agreed
Contractor-procurement communication gaps cause delays	10.3	13.6	33.5	27.8	14.8	3.10	1.35	5th	Agreed
Meetings and documentation support better performance	10.9	14.0	33.3	27.1	14.7	3.09	1.34	6th	Agreed
Feedback mechanisms are not prioritized	11.5	14.5	32.5	27.0	14.5	3.06	1.36	7th	Agreed

The empirical Implications of the Communication, Procurement Management, and Project Performance. The results of Table 4.4 provide a clear empirical evidence of the fact that successful procurement results and project performance in the context of the infrastructure delivery in the public Nigerian universities are impossible without effective communication. The most highly ranked item, the one that has the mean of 3.21, is the statement that Effective communication among stakeholders will enhance the procurement performance, and this fact augers well with the accumulating evidence that teamwork in communication among project actors is a key success factor in public-sector procurement. As an example, Adeniran and Umeh (2019) in their multi-institutional research concluded that projects, in which the stakeholder communication protocol was embedded, showed much more successful results in respect to budget compliance and timely results.

The result also represents the international norms provided by the PMI PMBOK Guide that highlights communication as a process group that crosscuts all knowledge disciplines of project management (PMI, 2017). This is particularly true in complex settings, such as public universities in Nigeria, where procurement is often marked by multiple levels of control, internal departments and external suppliers, clarity and consistency in communication will mitigate the chance of misinterpretation and create alignment of stakeholders.

The second item, with the highest rank, is the one that states Lack of communication causes

misunderstandings during procurement (mean = 3.19), which supports the findings of Olateju and Fagbenle (2015) who reported communication failures as the main contributor to the occurrence of procurement documentation errors and late payments in Nigerian tertiary institutions. In a study, they noted that a broken communication channel frequently causes trouble in executing the contract, change orders and dispute of a project. Similarly to the study presented here, this fact supports the importance of investing in formalized communication protocols.

On the same note, the observation that decision-making during procurement processes is enhanced by frequent communication (mean = 3.16) resonates with Ojo et al. (2011), who had stated that real-time communication between procurement officers, end-users and contractors improved the responsiveness of the procurement cycle and minimized error margins. This implies that besides formal documentation, the degree and the rate of communication is also indicative of the efficiency in procurement.

The fact that the quality of interdepartmental communication has an effect of 3.12 on the performance of procurement also reflects the internal alignment problem that most of the public universities have. Ogunsemi et al. (2016) explain that delays during procurement can be usually traced to the bottlenecks between procurement and finance and legal departments. Such silos limit the sharing of knowledge and slow down the processing of bids, evaluations and award recommendations. Therefore, the issue of interdepartmental communication is not a simple matter concerning the operation, but a strategic demand of procurement success.

The significance of the communication between contractors and clients is reflected in the item entitled “Communication gaps between contractors and procurement officers result in project delays (mean = 3.10). This is consistent with previous research by Idoro (2012) who observed that ambiguous project requirements and ineffective progress feedback loops tend to lead to demobilization of the contractor, low quality delivery, and scope creep. The latter problems are particularly problematic in Nigeria where the contractor engagement is rather short-term and not continuity-based. Misaligned expectations and lawsuits are therefore caused by the communication inefficiencies.

The focus on structured platforms like the one that is titled Meetings and documentation support better procurement performance (mean = 3.09) is in line with the principles of global procurement governance, including the ones proposed by World Bank (2021), which suggests transparent record-keeping and consultations with stakeholders as the means of protection against fraud and inefficiency. Adesanya et al. (2021) observe that in the Nigerian context, however, these platforms are not strongly institutionalized or even regularly implemented, and this fact restricts their effectiveness.

Lastly, a somewhat lower value of the feedback mechanisms not prioritized in the public procurement processes (mean = 3.06) indicates that there is a significant gap in the practices of post-procurement evaluation. Although the answers indicate that the feedback loops are possibly not fully exploited, Aduwo et al. (2016) state that the feedback loops are critical to the learning process, as well as constant improvement. The absence of formal post-mortem analysis of the procurement operations leads to the recurrence of the previous errors and prevents the innovative approach to the process enhancement.

The standard deviations spread across the items are rather limited, and the difference between the minimum and maximum of standard deviation is between 1.30 and 1.42, which covers all items, suggesting the consistent pattern of perception among all respondents. This is an indication of a common understanding of the challenges associated with communication and their impact on procurement and performance, at both universities and stakeholder positions..

Strategies and Best Practices for Procurement Improvement

The findings of Table 4.5 highlights the perceptions of the respondents about the useful strategies and best practices that can improve procurement outcomes. The mean of all the seven items, their frequency distribution, and standard deviation all show that all of them have a moderate to high degree of agreement.

The one that had the largest average (3.27) score was the Adoption of digital procurement platforms enhances efficiency and transparency. This item was number one, and the proportion of respondents who agreed or strongly agreed to this item was quite high (more than 45 percent). This is indicative of the

growing appreciation of e-procurement tools in reducing manual errors, enhancing audit trails and minimizing chances of corruption. Some researchers (e.g., Akindele and Adewuyi, 2020) have highlighted the benefits of digital platforms to ease the procurement process in the public sector and ensure accountability in contracting.

Next in line was; "Regular training and capacity-building of procurement staff enhances procurement results with a mean score of 3.25. It means that human capital development is an aspect of procurement reform which is appreciated by respondents. Lack of qualified procurement professionals is a problem in many of the Nigerian public universities, and it influences adherence to best practice. This observation concurs with the stance of Ojo and Adeyemi (2018), who believed that sustainable procurement reform has to be supported by the consistent professional growth.

The product, which was rated at 3.20, is called the establishment of procurement monitoring units that enhance accountability and this implies a high level of support of institutional monitoring systems. Respondents understand that independent procurement monitoring unit (PMU), internal or external, is crucial in the identification of anomalies, value-saving, and procurement alignment with prescribed budgets and schedules. This is in correlation with international standards like the World Bank and OECD (2016) standards.

The fourth-ranked item, which is Timely release of funds ensures uninterrupted procurement activities had a mean score of 3.17. Fiscal discipline and funding on time were cited by the respondents as key essentials in averting delays in the project and allowing the contractors to mobilize resources as planned. Delayed payments on the budget will usually hamper procurement processes, particularly in state universities that are highly reliant on state subsidies.

Also, the score of the item Stakeholder engagement enhances the quality and ownership of procurement decisions was 3.14. This means that participatory procurement, in which end-users, finance officers and external stakeholders are consulted, boosts project relevance and minimizes the resistance in the process of implementation. Past studies (Obodoh et al., 2019) affirm that inclusive procurement helps make procurement more transparent and reduces the likelihood of litigation or conflict with the community.

It had a mean score of 3.13 on the sixth item, which is, Clear procurement policies and standard operating procedures enhance compliance. Respondents confirmed the need to be straightforward in matters related to regulation and uniformity of operations, especially in reducing the arbitrary decisions. It is also facilitated by the availability of standardized procurement manuals and policy documents in guiding the decision-making process and making sure that the procurement process adheres to the national procurement legislation and any other university requirements.

Finally, the question Strengthening audit and reporting mechanisms discourages corrupt practices had the lowest average score of 3.09 which is in the moderate agreement range. This is indicative of a broad support of an increased audit trail and post-procurement screening. Although this aspect was not rated as the seventh, the fact that it is given shows that the respondents understand the role of both preventive and corrective controls in the development of institutional trust.

The average scores of all items are between 3.09 and 3.27, with low standard deviations which means that respondents tend to think that the suggested strategies are really important. The items are ranked and it indicates that the focus has been on technological integration, human capacity development and institutional accountability as the key channels through which procurement reform will be achieved. Also, stakeholder inclusion and regulatory clarity-related items were also present in the foreground, and it shows a balanced knowledge of the technical and the governance-based best practices.
The results are consistent with the international models of procurement modernization and national reforms and change efforts to improve value-money, transparency and efficiency of provision. The aggregate knowledge confirms that managing the procurement issues demands a multi-pronged strategy that incorporates change in the structure with the introduction of the technologies and the ongoing education.

To sum up, Table 4.5 analysis shows that the stakeholders in Nigerian public university project are attentive to digitalization, capacity-building, timely

funding, stakeholder participation, and oversight mechanisms as the measures that help to enhance the procurement results. When institutionalized, these best practices might result in increased project efficiency, decreased delays in procurement, and increased confidence of people in how the public money is used. To be effective in the long term, such measures need to be embedded in policy changes, with effective monitoring and evaluation..

Table 4.5: Descriptive Statistics of Strategies and Best Practices

Item	Strongly Disagree (%)	Disagree (%)	Neutral (%)	Agree (%)	Strongly Agree (%)	Mean	SD	Rank	Remark
Adoption of digital procurement platforms enhances efficiency	8.2	10.5	33.4	31.3	16.6	3.27	1.33	1st	Agreed
Training and capacity-building improve outcomes	8.5	11.0	32.8	31.2	16.5	3.25	1.31	2nd	Agreed
Monitoring units improve accountability	9.1	12.4	31.6	30.5	16.4	3.20	1.34	3rd	Agreed
Timely release of funds prevents delays	10.0	13.0	31.4	30.0	15.6	3.17	1.35	4th	Agreed
Stakeholder engagement enhances ownership	10.3	13.2	32.1	29.3	15.1	3.14	1.36	5th	Agreed
Clear policies improve compliance	10.5	14.0	31.5	28.5	15.5	3.13	1.34	6th	Agreed
Audit and reporting mechanisms discourage corruption	11.2	14.5	31.0	28.0	15.3	3.09	1.36	7th	Agreed

The results of Table 4.5 can be seen as a valuable piece of empirical evidence on the perceived effectiveness of several reform options in order to improve the procurement performance of Nigerian state universities. The best rated item, which is, adoption of digital procurement platforms improves efficiency and transparency (mean = 3.27) very obviously implies that respondents believe technology adoption is the foundation of procurement reform. This is reflected within the study carried out by Akindele and Adewuyi (2020), as the authors discovered that e-procurement systems did greatly decrease the number of manual errors, shortened response time, and reduced the scope of corrupt practices in ministries across Nigeria. Similarly, Oluka and Basheka (2012) found out that audit trails are enhanced through the use of digital tools, subsequent enhancement of procurement integrity, and regulatory compliance.

The digital procurement is also consistent with the wider trends of public sector reforms e.g. the adoption of the Government Integrated Financial Management Information System (GIFMIS) in Nigeria, which seeks to digitalize procurement, budgeting and reporting. Within the university context, it implies an increased realization that manual system of procurement is becoming unsustainable, in particular whereby transparency and efficiency are the targeted results.

The second-ranked one, namely, the training and capacity-building of procurement personnel enhances procurement performance (mean = 3.25),

focuses on the human resources as a valuable facilitator of a procurement performance. This explains the results of Ojo and Adeyemi (2018), who stated that numerous tertiary institutions in Nigeria experience a lack of competencies in procurement officers, which can easily lead to procedural breaches, non-adherence, and mismanagement of the contract. The same conclusion was made by Adeniran and Umeh (2019) who found that there is a direct correlation between professional development and procurement accuracy and turnaround speed. So, the outcome confirms the necessity to institutionalize the mandatory capacity development programmes and provide the procurement officers with the certification and regular refreshers of the regulatory changes and best practice.

The other important implication lies in the fact that the item of "Establishing procurement monitoring units improves accountability (mean = 3.20) emphasizes on the role of independent oversight mechanisms. This follows the guidelines proposed by the OECD (2016) and World Bank, which mention the use of Procurement Monitoring Units (PMUs) to reduce the instances of fraud, maximise value, and ensure procurement is in line with approved budgets and schedules. Ibrahim and Babatunde (2019) reported a successful experience of PMUs in some federal agencies in Nigeria where timely interventions and audits resulted in the decrease of the rate of contract variation and an increase of the delivery timelines. In the case of universities, it implies that internal PMUs should be incorporated or that third parties should be involved in capital projects of significant magnitude.

The comparatively high score of Timely release of funds ensures uninterrupted procurement activities (mean = 3.17) restates the financial governance challenge inherent to most Nigerian public institutions. Udu and Nwafor (2020) noted that unpredictable disbursements by government sources usually stall current projects in universities leading to increase in costs and demoralization of contractors. What it means is that financial planning and procurement scheduling should be closely synchronized and institutions should seek ways through a process like procurement contingency reserve or draw-down clauses that can help reduce the effects of late funding.

Likewise, stakeholder engagement as measured on the item, Stakeholder engagement enhances the quality and ownership of procurement decisions (mean = 3.14) supports the significance of participatory procurement processes. A study carried out by Obodoh et al. (2019) revealed that the participation of end-users in the procurement cycle resulted in more relevant, acceptable and sustainable projects deliverables in Nigerian universities. Moreover, this kind of engagement reduces litigation and opposition in the implementation of projects through enhanced transparency and consensus. The results justify the calls to incorporate multi-stakeholder procurement committees comprising of end-users, technical professionals, legal professionals, and external observers.

The correlation to support clear procurement policies and SOPs (mean = 3.13) is an indication that lack of clarity in procurement rules still acts as a barrier. Aduwo et al. (2016) note that absence of standardized operating procedures usually results to discretionary decision-making and going against the Public Procurement Act. Thus, the findings are leading to the harmonization of the procurement documents in the Nigerian universities and the supply of simplified SOPs which will be consistent with the national legislation at the same time as the institutional peculiarities.

Lastly, the implication of the mean of strengthening audit and reporting mechanisms discourages corrupt practices (mean = 3.09) is that post-procurement accountability is accepted, but not more strongly stressed by the respondents. This could indicate a more general organizational failure in the area of audit enforcement and use of feedback. Nevertheless, the studies by Ogunsemi et al. (2016) and Okereke and Kalu (2017) affirm the importance of institutional learning and procurement maturity through internal audits, value-for-money review, and periodic reporting. Therefore, this finding once again highlights the significance of prevention as well as correction in long term procurement reform..

V. SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

This chapter presents a comprehensive summary of the study, offers an interpretation of the key empirical findings, draws relevant conclusions, and outlines recommendations based on the results. It brings

together the insights gained from the literature review, data analysis, and field observations to articulate the implications of procurement management practices in Nigerian public universities. The chapter is structured to revisit the central aim of the study, which was to assess the impact of procurement delays on project cost, quality, and delivery timelines, and to identify key strategies that can improve procurement outcomes in higher education infrastructure delivery. The methodology adopted—primarily a quantitative approach using a structured Likert-scale questionnaire administered to 281 respondents—provided the empirical foundation for the analysis. In addition to summarizing findings from each objective, this chapter highlights the study's contribution to knowledge, offers practical and policy recommendations, and suggests directions for future research in the domain of public sector procurement.

Summary of the Study

The study was motivated by widespread concerns over the persistent delays and inefficiencies characterizing public university infrastructural projects in Nigeria. These challenges often manifest in cost overruns, prolonged delivery timelines, compromised quality, and loss of stakeholder confidence. Despite the presence of procurement laws and institutional frameworks, public procurement in Nigerian tertiary institutions remains marred by systemic inefficiencies. The literature reviewed established that procurement challenges are not only technical but also institutional, involving issues such as bureaucratic bottlenecks, corruption, weak enforcement, inadequate planning, and capacity gaps. The conceptual and theoretical underpinnings of the study were informed by project management theory, systems theory, and procurement performance frameworks, which collectively provided a lens for evaluating the interrelationships among communication, procurement processes, and project outcomes.

To empirically investigate these issues, a structured questionnaire was administered to 281 stakeholders involved in public university projects across major Nigerian institutions. The research adopted a survey design and employed descriptive and inferential statistical tools including mean ranking, standard deviation, and regression analysis. The analysis was structured around four core objectives: first, to examine the challenges of procurement management in Nigerian public university infrastructure delivery; second, to assess the effects of procurement delays on project cost, quality, and timely delivery; third, to explore the relationship between communication, procurement management, and project performance; and fourth, to identify strategies and best practices for improving procurement outcomes. The data were analysed using SPSS, and results were presented in tabular form across descriptive statistics (Tables 4.1 to 4.5) and regression outputs. The findings indicated a high degree of convergence among respondents regarding the negative impact of procurement delays and the critical role of communication and institutional reforms in improving performance.

Discussion of Key Findings

The results of the study provide valuable information on the operational and strategic issues that characterize procurement regarding the Nigerian public university projects. On Objective One, the findings indicated that poor procurement planning, bureaucratic bottlenecks, and corruption were the most important issues that impacted on procurement effectiveness. This is consistent with the results of Oyegoke and Alabi (2016), who emphasized that the procurement process in Nigerian universities is usually disrupted by the slowness of approvals and the absence of coordination among the stakeholders. In a similar manner, Ogunsemi and Jagboro (2014) discovered that inefficiency in procurement is common among many public institutions because they have disjointed responsibilities and misaligned incentives. The averaged scores of the challenges provided in Table 4.2 imply that the degree of consensus is moderate-high as it seems that the vast majority agrees on the severity and longevity of the given issues.

In Objective Two, which concerned the impact of procurement delay on project cost, project quality, and project timely deliveries, the outcomes were clear to show that there was a serious negative impact. According to Table 4.3, there was a strong agreement of the respondents that the issue of procurement delays resulted in cost overruns, poor quality of work, and disruption of schedule of projects. These results are supported by previous research like that of Ameh and Osegbo (2011) who discovered that changing material prices and modification of contract were usually as a result of inefficiencies in procurement. In the same vein, Idoro (2012) highlighted the fact that procurement delays

negatively impact material quality through rushed replacement of contractors, as well as, the long-term durability of infrastructure. The results in this section were in the range of 3.06 to 3.18 which is evidence of consistent impression among the surveyed institutions. It means that, unless purchase schedules are followed and endemic delays are resolved, the results of projects will remain severely impaired, both monetarily and qualitatively.

The third objective that measured the connection between communication and procurement performance was the strongest clue on how good communication is at the heart of successful procurement performance. The item with the highest rank, which is observed in Table 4.4, was that effective communication among the stakeholders enhances the performance of procurement. According to the respondents, they identified structured meetings, timely communication, flow of information across different departments, and coordination of activities among the contractors as the major enablers of timely execution of procurements. These findings resonate with those produced by Turner (2016), Olateju and Fagbenle (2015), who observed that poor communication connections within the public project environment tend to give rise to contractual misunderstandings, documenting mistakes, and conflicts. In addition, the findings back the assumption that communication is not just an auxiliary tool but a key mechanism of co-ordinating procurement schedules, maintaining accountability and improving collaborative problem solving among procurement participants.

Lastly, Objective Four was concerned with strategies and best practices that would help enhance procurement results. Table 4.5 showed that digital procurement platforms, training and capacity-building, timely release of funds and stakeholder engagement were highly supported. These data are in line with international best practices and support comparable conclusions made by Akindele and Adewuyi (2020), who recommended the implementation of e-procurement to enhance transparency in the public procurement in Nigeria. In addition, the support of procurement monitoring units and clarification of regulations echo with international standards like those of the OECD on the reform of the public procurement. Taken together, the results indicate that an effective improvement in the performance of procurement in Nigerian universities will demand the multidimensional approach that will integrate technological, institutional and HR interventions.

Implications of the Study

The findings of this research have important implications for theory, practice, and policy. From a theoretical standpoint, the study contributes to the evolving body of knowledge on public procurement and project management in the context of higher education infrastructure, particularly in developing countries like Nigeria. It validates and extends existing theoretical frameworks such as systems theory and project management theory, by highlighting how procurement challenges, if not addressed holistically, can disrupt entire project systems. The integration of procurement planning, communication effectiveness, and institutional capacity as critical determinants of project success offers a more nuanced understanding of the multifactorial dynamics that influence procurement performance in public institutions.

Practically, the study's results shed light on critical inefficiencies within Nigerian public university procurement systems, emphasizing the need for more proactive and data-driven project governance. The moderate to high levels of agreement across all four objectives underscore the urgency of improving planning, reducing bureaucratic delays, and embracing digital platforms for procurement. Institutional actors, particularly procurement officers, project managers, and finance units within universities, must recognize that procurement is not merely an administrative task but a strategic function that requires continuous monitoring, stakeholder engagement, and professional development. This insight is critical in repositioning procurement units as strategic value drivers rather than operational bottlenecks.

From a policy perspective, the study emphasizes the need for structural reforms in public procurement regulation and oversight. The consistent reference to corruption, political interference, and funding delays in the data indicates systemic weaknesses that require national attention. Policymakers must prioritize the timely release of project funds, strengthen procurement monitoring mechanisms, and enforce compliance with procurement laws. Furthermore, the adoption of digital procurement systems should be institutionalized as a national policy objective, with

clear implementation roadmaps for public universities. If effectively implemented, these reforms could significantly reduce waste, improve delivery timelines, and enhance the overall credibility of the procurement process in Nigeria's public tertiary institutions.

Recommendations

Based on the findings of this study, several recommendations are proposed to improve procurement processes and project performance in Nigerian public university infrastructure projects. Firstly, there is a pressing need for public universities to institutionalize comprehensive procurement planning frameworks. This includes the early identification of procurement needs, realistic budgeting, and timeline forecasting to mitigate avoidable delays. Universities should establish procurement calendars aligned with fiscal cycles to ensure smoother workflows and better alignment with project timelines. The data showed that poor planning was one of the most widely acknowledged causes of procurement inefficiency.

Secondly, the adoption of digital procurement platforms should be prioritized. E-procurement tools offer transparency, reduce bureaucratic bottlenecks, and provide real-time tracking of procurement milestones. These systems, if integrated with project management software, can significantly improve documentation, accountability, and speed of execution. Universities should also ensure that procurement personnel receive regular capacity-building training focused on current public procurement laws, ethical standards, and technological competencies. The study revealed that capacity gaps among procurement officers remain a barrier to effective implementation, thereby requiring structured professional development programs.

Additionally, there is a need to strengthen oversight mechanisms within the procurement system. This can be achieved by establishing internal procurement monitoring units or task forces equipped to conduct regular audits, identify non-compliance, and make data-driven recommendations. These units should operate with a high level of independence and report directly to university governing councils or internal audit departments. Engagement with stakeholders—particularly end-users, contractors, and regulatory bodies—must also be improved through structured communication and feedback systems. Such participatory approaches can enhance ownership, reduce disputes, and improve the quality of procurement decisions.

Lastly, timely release of funds should be enforced by federal and state government agencies responsible for funding public universities. Delays in funding were found to be a significant contributor to procurement-related project setbacks. Policymakers should work towards aligning budgetary disbursements with project milestones, while universities should improve their internal financial planning to ensure that allocated funds are optimally utilized. Collectively, these recommendations aim to foster a procurement culture that is efficient, transparent, and performance-oriented.

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