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Enhancing Knowledge Management in Construction Procurement for Efficient Project Delivery in Selected Nigerian Universities

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Abstract

Infrastructure development is essential to advancing higher education in Nigeria, yet procurement processes for construction projects in universities often face inefficiencies, delays, and substandard outcomes. Grounded in Knowledge Management (KM) theory and the Resource-Based View, this study explores how KM can enhance construction procurement practices in federal, state, and private universities across Nigeria's North Central region. The study adopts a quantitative research design using structured questionnaires distributed to construction and procurement professionals across selected universities. Descriptive and inferential statistics, including chi-square tests, were used to analyze the data. The findings reveal that a majority of universities lack formal KM frameworks, with 80% still relying on paper-based documentation. Key challenges identified include bureaucratic delays, limited digital infrastructure, funding constraints, and inadequate training. A marginally significant relationship was found between the presence of KM frameworks and supplier performance evaluation, indicating that KM contributes to better procurement decision-making. However, KM did not significantly influence the duration of procurement cycles, which are primarily affected by bureaucratic inefficiencies and regulatory challenges. The study underscores the need for universities to institutionalize KM practices through digital knowledge repositories, regular staff training, and process reforms. It recommends the integration of e-procurement systems, stricter enforcement of the Public Procurement Act (2007), and fostering a culture of knowledge sharing. These strategies can improve procurement efficiency, enhance transparency and accountability, and improve efficiency in university infrastructure delivery.

Keywords: Knowledge Management (KM), Construction Procurement, Project Delivery, Nigerian Universities, E-Procurement.

INTRODUCTION

Infrastructure development is essential to a nation's economic growth, particularly in a developing country like Nigeria. The provision of physical infrastructure is of critical importance in any university of higher learning because it provides the necessary physical and technological environment needed for effective teaching, learning, and research.

The construction sector is crucial for promoting national growth, especially in the enhancement of higher education infrastructure. Within this sector, effective procurement mechanisms are essential to ensuring that projects are completed within stipulated timelines, adhere to budget constraints, and maintain high-quality standards. However, procurement processes in Nigerian universities, which cut across public and private universities, are often hindered by inefficiencies, which result in extended project durations, cost overruns, and substandard infrastructure.

The integration of Knowledge Management (KM) methodologies into procurement processes can streamline operations, facilitate knowledge exchange, and enhance decision-making. KM is characterized by the systematic acquisition, organization, dissemination, and application of university knowledge, which fosters collaborative engagements and mitigates procurement risks. Despite its advantages, KM adoption within Nigeria's construction sector remains limited, leading to ineffective public procurement strategies and suboptimal project execution.

The Public Procurement Act (2007) was introduced to promote transparency, accountability, value for money, and operational efficiency in procurement. However, poor enforcement, corruption, and inadequate information-sharing frameworks have significantly diminished its effectiveness. This study examines how KM strategies can be leveraged to improve construction procurement in Nigerian universities, ensuring faster project delivery, cost-effective decision-making, and quality infrastructure development.

1.1 Aim and Objectives of the Study

This study aims to investigate the role of Knowledge Management (KM) in enhancing construction procurement processes for efficient project delivery in Nigerian universities.

Objectives:

To achieve this aim, the study pursues the following specific objectives:

i. To examine the current state of Knowledge Management (KM) adoption in construction procurement across Nigerian universities.
ii. To identify the key challenges hindering effective KM integration in university construction procurement.
iii. To assess the impact of formal KM frameworks on supplier performance and project timelines.
iv. To assess the impact of formal KM frameworks on procurement efficiency and project timelines.
v. To propose strategic recommendations for improving KM implementation in Nigerian university construction procurement.

1.2 Research Hypotheses

1. H_0: There is no significant relationship between the formal Knowledge Management Framework and Supplier performance evaluation

   H_1: There is a significant relationship between the formal Knowledge Management Framework and Supplier performance evaluation

2. H_0: There is no significant relationship between having a formal KM framework and the duration of procurement processes.

   H_1: There is a significant relationship between having a formal KM framework and the duration of procurement processes.

LITERATURE REVIEW

2.1 Knowledge Management in the Construction Industry

Knowledge Management (KM) is a systematic and strategic approach that facilitates the identification, storage, dissemination, and utilization of knowledge to improve decision-making and overall efficiency (Nonaka & Takeuchi, 1995). In the construction industry, KM plays a crucial role in enhancing efficiency, fostering innovation, and mitigating risks (Unegbu et al., 2022). Effective KM practices facilitate better project planning, reduce errors, and enable professionals to leverage past experiences to improve procurement and construction processes (Ohamma et al., 2021).

Despite the recognized benefits of KM, research indicates that its implementation in the Nigerian construction industry remains low. Mohammed et al. (2020) found that many Nigerian construction

organizations lack structured KM frameworks, leading to inefficiencies, project delays, and poor collaboration among stakeholders. The study emphasized the need for universities and construction firms to integrate KM strategies, such as digital knowledge repositories and best-practice sharing, to improve procurement processes.

Mohajan (2017) defines KM as an overarching term that includes functions such as generating, assessing, organizing, storing, and disseminating knowledge. Highlighting that fostering a culture of knowledge sharing is essential for developing a KM-oriented approach. KM provides different mechanisms for preserving and sharing expertise, ultimately enhancing organizational efficiency, competency, and profitability. KM is also described as an ongoing process of managing knowledge to fulfill business requirements.

Siami-Namini S (2018) states that KM is a discipline enabling individuals, teams, organizations, and communities to collectively and systematically capture, store, share, and apply their knowledge. It expands on this concept, explaining that KM involves a set of organizational principles and technologies aimed at improving knowledge workers' capacity to create business value. When implemented successfully, KM enables organizations to capitalize on collective expertise, improve decision-making, and gain a strategic advantage. Research by Thankgod (2021) suggests that KM fosters innovation, streamlines project timelines, enhances quality, and increases customer satisfaction.

Saeed et al. (2023) argue that well-structured KM helps businesses maximize the potential of intangible assets by leveraging both internal and external knowledge. Within the construction industry, KM improves team collaboration, promotes best practices, and aids in strategic decision-making through shared documentation, project methodologies, and lessons learned. Dahiru (2016) identifies key benefits of KM in construction, including enhanced information management, improved intelligence, better strategic planning, and more effective teamwork.

While KM does not have a universally accepted definition in construction (Omale & Gurin, 2024), it emphasizes that knowledge is a critical asset for firms, driving market competitiveness and innovation. Various researchers, such as Nonaka and Takeuchi, Egbu, and Botteril, support the view that knowledge is a key competitive advantage in project-based industries. Mohajan (2016) classifies knowledge into explicit and tacit forms. He elaborates on this by describing tacit knowledge as being deeply ingrained in personal experiences, emotions, and values, making it difficult to articulate, and further emphasizes that the more tacit the knowledge is, the harder it is to transfer to others. Polanyi (1950) famously stated, "We know more than we can express."

2.2 The Significance of Knowledge Management in Construction Procurement

Knowledge management (KM) plays a crucial role within construction procurement by reducing risk, optimizing efficiency, and promoting innovation. It helps mitigate procurement errors through

documented best practices, enhances operational efficiency by improving contractor selection and bid evaluation, and drives innovation through emerging technologies like AI-driven analytics and blockchain-based contract management.

Research by Mohammed et al. (2020) and Ohamma et al. (2021) indicates that construction firms incorporating KM frameworks experience lower procurement expenditures and accelerated project completion rates. However, in Nigerian universities, KM integration remains inconsistent, with many universities still relying on fragmented, outdated, and manual procurement methodologies.

2.3 Challenges in Construction Procurement within Nigerian Universities

Several studies have identified key challenges affecting construction procurement in Nigerian universities. These challenges include:

i. Limited Knowledge Sharing - Many universities lack formal mechanisms for sharing procurement knowledge, leading to repeated mistakes and inefficiencies (Mohammed et al., 2020).

ii. Corruption and Fraud - Procurement fraud, bribery, and unethical contractor selection practices are prevalent, particularly in public universities (Maduekeh et al., 2022).

iii. Regulatory Compliance Issues - Many universities struggle to comply with the Public Procurement Act, resulting in legal disputes and project delays (Ohamma et al., 2021).

iv. Technological Limitations - The absence of digital procurement platforms and data analytics tools limits knowledge transfer and process optimization (Unegbu et al., 2022).

v. Skill Gaps - Many procurement officers lack adequate training in knowledge management and digital procurement tools, affecting project execution (Maduekeh et al., 2022).

vi. Funding - The challenge of funding mainly affects Federal and State Universities. Budgetary allocations are often not cash-backed, or the funding is limited through the Tertiary Education Trust Fund (TETFund).

2.4 Strategies for Enhancing Public Procurement through KM

To address these challenges, several studies suggest integrating KM strategies into construction procurement, which enhances efficiency, transparency, and project success. Key strategies include:

i. Developing Digital Knowledge Repositories - Storing procurement best practices, contractor performance data, and lessons learned in a centralized database to facilitate knowledge transfer (Mohammed et al., 2020).

ii. Implementing E-Procurement Systems - Automating procurement processes to enhance efficiency, transparency, and decision-making (Ohamma et al., 2021).

iii. Training and Capacity Building - Providing continuous training for procurement officers and construction professionals to enhance KM skills (Unegbu et al., 2022).

iv. Enhancing Collaboration among Stakeholders - Encouraging partnerships between universities, construction firms, and regulatory bodies to improve knowledge sharing and procurement efficiency (Maduekeh et al., 2022).

v. Strengthening Regulatory Frameworks - Enforcing anti-corruption policies and ensuring compliance with procurement laws to improve accountability (Ohamma et al., 2021).

2.5 Theoretical Framework

The theoretical framework for this study is grounded in established theories that explain knowledge management (KM) practices, procurement efficiency, and project success in the construction industry. These include the Knowledge Management Theory, Resource-Based View (RBV) Theory, and Public Procurement Theory.

2.5.1 Knowledge Management Theory

The Knowledge Management Theory, developed by Nonaka and Takeuchi (1995), explains how organizations create, store, and apply knowledge for continuous improvement. This theory is particularly relevant to construction procurement in Nigerian universities, where inefficiencies arise due to inadequate knowledge retention and poor information-sharing mechanisms (Mohammed et al., 2020). Nonaka and Takeuchi (1995) proposed the SECI Model (Socialization, Externalization, Combination, and Internalization) to explain knowledge creation and transfer:

i. Socialization: Sharing tacit knowledge through direct interactions. In university procurement, this includes meetings, mentoring, and collaboration among procurement officers (Ohamma et al., 2021).

ii. Externalization: Converting tacit knowledge into explicit knowledge. This involves documenting best practices, procurement guidelines, and contractor performance records (Unegbu et al., 2022).

iii. Combination: Organizing and integrating knowledge into a structured framework, such as digital repositories and procurement databases (Maduekeh et al., 2022).

iv. Internalization: Applying acquired knowledge in procurement decision-making and construction project execution (Mohammed et al., 2020).

By applying this model, Nigerian universities can improve procurement efficiency, avoid repeated mistakes, and enhance project outcomes.

2.5.2 (RBV) Theory

The Resource-Based View (RBV) Theory, introduced by Barney (1991), argues that organizations gain competitive advantages by effectively managing their internal resources, including knowledge and expertise. This theory is relevant to procurement processes in universities because effective KM

Resource-Based View can serve as a strategic resource for improving procurement efficiency and project success (Ohamma et al., 2021). RBV identifies resources as valuable, rare, inimitable, and non-substitutable (VRIN):

i. Valuable: Knowledge and expertise in procurement management improve efficiency and cost-effectiveness (Maduekeh et al., 2022).

ii. Rare: Universities that implement structured KM systems gain an edge over universities with weak procurement knowledge (Unegbu et al., 2022).

iii. Inimitable: Strong KM practices create unique procurement frameworks that competitors cannot easily replicate (Mohammed et al., 2020).

iv. Non-substitutable: Procurement knowledge and best practices cannot be replaced by other means without affecting project outcomes (Ohamma et al., 2021).

RBV suggests that if Nigerian universities acquire procurement knowledge, they can optimize their procurement processes and enhance infrastructure development.

2.5.3 Public Procurement Theory

Public Procurement Theory focuses on transparency, efficiency, and accountability in government-related procurement processes. It is especially relevant to federal and state universities in Nigeria, where public funds are used for construction projects (Maduekeh et al., 2022).
Key principles of Public Procurement Theory include:

i. Value for Money: Ensuring cost-effective procurement through knowledge-driven decision-making (Mohammed et al., 2020) & (PPA, 2007).

ii. Transparency: Using knowledge-sharing platforms to reduce corruption and inefficiencies (Unegbu et al., 2022).

iii. Fair Competition: Ensuring open competitive bidding and access to procurement knowledge among contractors (Ohamma et al., 2021).

iv. Accountability: Applying best practices to ensure procurement officers make informed decisions (Maduekeh et al., 2022).

2.6 Relevance of Theoretical Framework to This Study

This study applies these three theories to assess how knowledge management can improve procurement processes in Nigerian universities. Knowledge Management Theory provides the foundation for structuring procurement knowledge, Resource-Based View Theory highlights how knowledge serves as a strategic asset, and Public Procurement Theory ensures that procurement processes are transparent, efficient, accountable, and provide value for money.

By integrating these theoretical perspectives, this study offers a holistic approach to enhancing construction procurement in public and private universities in Nigeria.

METHODOLOGY

This study adopts a quantitative research design to evaluate the role of knowledge management (KM) in enhancing public procurement efficiency in Nigerian university construction projects. The methodology includes survey research via structured questionnaires distributed to procurement officers, construction professionals (engineers, architects, Quantity Surveyors), Project managers /Consultants, and contractors from federal, state, and private universities.

3.1 Research Design

This study adopts a descriptive research design to analyze the state of knowledge management (KM) in construjction procurement. A descriptive research approach was employed using Inferential statistics to examine relationships between the presence of a formal KM framework, the frequency of university evaluation of supplier performance, and the duration of a typical procurement process to determine efficiency in project delivery.

3.2 Population and Sampling

The study targets construction professionals (engineers, architects, Quantity Surveyors), Project Managers/Consultants, procurement officers, and Contractors, in Private, State, and Federal Universities. This population includes individuals directly involved in procurement decision-making, such as construction professionals and procurement officers directly responsible for supplier evaluation and construction contract management.

3.2.1 Sampling Technique

A purposive sampling technique was employed to ensure the participation of professionals with relevant construction and procurement experience, enhancing the reliability of the study. Nigeria has 270 universities, which are categorized into Private, State, and Federal. They are distributed across six geopolitical zones, with the South West having the highest number (65) and the North East the least (35). The North Central region, with 50 universities, was selected for this study due to proximity to the researcher, convenience, time constraints, and the need for a manageable scope. One university was selected from each category of Private, State, and Federal, to ensure a balanced representation of university ownership structure, facilitating a comprehensive analysis of construction procurement practices and knowledge management frameworks.

3.2.2 Sample Size Determination

The Krejcie and Morgan Table (1970) was used to determine an appropriate sample size. Based on this table, 50 questionnaires were distributed to procurement officers, construction professionals (engineers, architects, Quantity Surveyors), Project Managers/Consultants, Contractors, and others. Out of these,

44 responses were received, resulting in an 88% response rate. This is also within the acceptable minimum response rate suggested by Sekaran (2000) in online research instruments. This high response rate enhances the reliability of the study's findings.

3.3 Data Collection

The study relies on quantitative data collected through structured questionnaires incorporating both closed-ended and open-ended questions that were administered electronically using Google Forms to gather insights on public procurement practices in selected Nigerian universities. The survey focused on five key areas: demographic details (role, experience, and university type), current procurement practices, knowledge management strategies, challenges hindering KM adoption, and recommendations for improving KM in procurement. This approach ensured a comprehensive understanding of the factors influencing procurement efficiency and KM implementation in selected Nigerian universities.

3.4 Data Analysis

Data analysis was conducted using SPSS software Version 27.0 to ensure precision and reliability. Descriptive statistics (frequencies and percentages) were used to assess respondents' perspectives on knowledge management (KM) adoption and procurement practices. Inferential statistics, particularly chi-square tests, assessed the relationship between the formal KM framework, the frequency of university evaluation of supplier performance, and the time taken for a typical procurement process. These statistical tests help determine the significance and strength of this relationship to extract insights, challenges, best practices, and recommendations for improving KM in construction procurement.

RESULTS AND DISCUSSION

The study analysed responses from 44 construction and procurement professionals across a private, state, and federal university. The demographic characteristics provide insights into the distribution of respondents based on factors such as university affiliation, years of experience, and procurement roles. This distribution ensures a balanced representation of construction procurement practices in different university settings.

Picture 1: Types of Universities

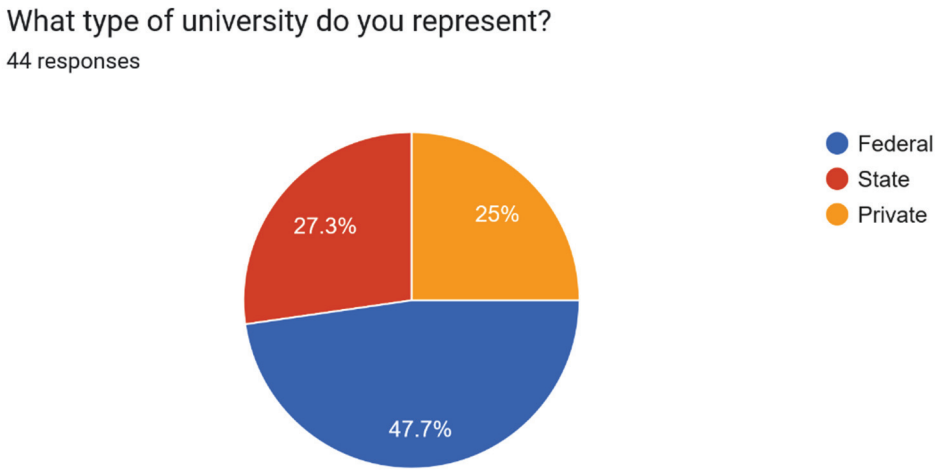

Table 1: Demographic Characteristics

	Variables	Frequency	Percentage %
1.	**Type of University**		
	Federal	21	47.7%
	State	12	27.3%
	Private	11	25.0%
2.	**Role in university procurement or construction?**		
	Procurement Officer	4	9.3%
	Construction Professionals (Engineers, Architects, Quantity Surveyors)	33	76.7%
	Project Manager /Consultants	2	4.7%
	Contractor	2	4.7%
	Others	2	4.7%
3.	**How many years of experience do you have in procurement and construction?**		
	0-5 years	4	9.3%
	6-10 years	13	30.2%
	11-15 years	14	32.6%
	16+ years	12	27.9%
4.	**What is your highest level of education?**		
	Bachelor's	19	44.2%
	Master's	19	44.2%
	Professional Certification	5	11.6%

Table 1 above shows that the majority of respondents (47.7%) are from federal universities, while state and private universities account for 27.3% and 25.0%, respectively. The predominant professional group comprises construction professionals, including engineers, architects, and quantity surveyors, who make up 76.7% of the respondents. Procurement officers represent 9.3%, while project managers, consultants, and contractors each constitute 4.7% of the total. In terms of experience, most respondents have between 6-15 years of experience in procurement and construction, with 32.6% having 11-15 years and 30.2% having 6-10 years. Meanwhile, 27.9% of respondents have over 16 years of experience, and only 9.3% have 0-5 years of experience. Educationally, a majority hold either a bachelor's or master's degree, with both categories making up 44.2% each, while 11.6% have professional certifications. These findings suggest that the surveyed population is primarily composed of experienced construction professionals working within federal universities, possessing significant industry expertise, and holding strong academic qualifications.

4.1 Knowledge Management in Procurement and Construction

Table 2: Formal training on KM in Procurement and Construction

	Question	Yes. F (%)	No. F (%)	Total. F (%)
1.	Have you received formal training on knowledge management in procurement?	23 (53.5%)	20 (46.5%)	43 (100%)
2.	Have you received formal training on knowledge management in construction?	30 (69.8%)	13 (30.2%)	43 (100%)

Table 2 shows that the data on knowledge management in procurement and construction indicates that 53.5% of respondents have received formal training on knowledge management in procurement, while 46.5% have not. In the construction sector, a higher percentage (69.8%) have undergone formal training, whereas 30.2% have not. This suggests that knowledge management training is more prevalent in construction than in procurement, though a significant portion of respondents in both fields have yet to receive such training.

Table 3: Formal KM framework for construction procurement

	Question	Yes. F (%)	No. F (%)	Not Sure. F (%)
1.	Does your university have a formal knowledge management framework for construction procurement?	16 (37.2%)	17 (39.5%)	10 (23.3%)

Table 3 reveals that university adoption of a formal Knowledge Management (KM) framework for construction procurement is fairly distributed. Specifically, 37.2% of respondents indicated that their university has a formal KM framework, while 39.5% reported that their university does not have one. Additionally, 23.3% of respondents were uncertain about the existence of such a framework.

However, a Comparison between types of universities and the usage of a formal knowledge management framework for construction procurement reveals that federal universities have the highest adoption rate, with 52.4% of universities implementing such frameworks. In contrast, state universities exhibit the lowest adoption rate, with only 8.3% reporting the presence of a formal framework, while 66.7% do not have one. Private universities fall in between, with 40.0% adopting a framework. The findings suggest that federal universities may benefit from better resources, policies, or mandates that encourage the implementation of knowledge management frameworks, whereas state universities may face resource constraints or a lack of policy enforcement. Private universities demonstrate moderate adoption, indicating variability in strategic priorities across universities.

Table 4: Methods of storing knowledge

	Question	Digital knowledge repository	Paper-based records	Informal discussions	Not documented
1.	How is construction procurement knowledge stored in your university?	8 (17.8%)	36 (80.0%)	4 (8.9%)	3 (6.7%)

Table 4 indicates that the majority of respondents (80.0%) rely on paper-based records as the primary method of documentation. These findings suggest that traditional methods, particularly paper-based records, dominate knowledge storage in construction procurement. The relatively low adoption of digital repositories highlights a potential opportunity for universities to improve efficiency through digital transformation. The presence of informal discussions and the lack of documentation in some cases also suggests a risk of knowledge loss and inconsistencies in procurement practices.

Table 5: Use of lessons learnt for future procurement processes

Question	Always	Often	Sometimes	Rarely	Never

1.	How often are lessons from previous projects used to improve future procurement processes?	8 (18.6%)	14 (32.6%)	15 (34.9%)	4 (9.3%)	2 (4.7%)

Table 5 shows that 34.9% of respondents apply lessons learned sometimes, while 32.6% do so often. These findings indicate that while a majority of respondents acknowledge the value of past experiences, their application is inconsistent. The relatively low percentage of those who always integrate lessons suggests potential gaps in structured knowledge management practices, which could impact efficiency and decision-making in procurement.

4.2 Procurement Process Efficiency and Project Delivery

Table 6: Challenges in knowledge sharing

	Question	Lack of documentation	Poor communication among staff	Lack of training	Resistance to change	Absence of a formal KM policy
1.	What are the main challenges in knowledge-sharing within procurement and construction at your university?	9 (20.0%)	17 (37.8%)	28 (62.2%)	21 (46.7%)	11 (24.4%)

Table 6 highlights several key issues: The most frequently cited challenge is a lack of training, reported by 62.2% of respondents. This is followed by resistance to change at 46.7% and poor communication among staff, which affects 37.8% of respondents. These findings suggest that the most significant barriers to effective knowledge-sharing stem from insufficient training and organizational resistance to change. Addressing these issues through structured training programs, improved communication strategies, and the implementation of a formal KM policy could enhance knowledge-sharing practices in procurement and construction universities.

Table 7: Methods of sharing knowledge

Question	Regular training sessions	Documented policies	Informal discussions	No formal process

1.	How is construction procurement knowledge shared in your university?	4 (9.3%)	19 (44.2%)	11 (25.6%)	9 (20.9%)

Table 7 shows that 44.2% of respondents indicated that knowledge is maintained through documented policies, making it the most common method. These findings suggest that while documented policies are the predominant method for knowledge sharing, a significant percentage of universities still depend on informal discussions or lack a structured approach. The absence of formal processes in some universities may pose challenges in knowledge retention and consistency in procurement practices.

4.3 Procurement Process Efficiency and Project Delivery

Table 8: Procurement challenges affecting project timelines

	Question	Bureaucratic delays	Inefficient supplier selection	Lack of digital tools	Poor contract management	Corruption/ fraud
1.	Which procurement challenges have affected project timelines in your university?	26 (57.8%)	11 (24.4%)	10 (22.2%)	18 (40.0%)	10 (22.2%)

Table 8 shows that the most commonly reported challenge is bureaucratic delays, cited by 57.8% of respondents. These findings suggest that bureaucratic inefficiencies and poor contract management are the most significant factors delaying procurement-related projects. Addressing these issues through process optimization, enhanced supplier selection mechanisms, and greater transparency in procurement practices could improve project timelines and overall efficiency.

Table 9: Timeline for a procurement process

	Question	Less than 1 month	1–3 months	4–6 months	More than 6 months
1.	How long does a typical procurement process take in your university?	9 (20.9%)	26 (60.5%)	4 (9.3%)	4 (9.3%)

Table 9 reveals that the majority of respondents (60.5%) reported that procurement takes 1–3 months. These findings suggest that most universities have procurement processes that fall within a 1–3-month timeframe, reflecting moderate efficiency. However, the fact that nearly one-fifth of universities experience procurement delays exceeding 4 months highlights potential inefficiencies that could impact project timelines and resource management.

Table 10: Procurement practices and improved project delivery

	Question	E-procurement systems	Knowledge-sharing platforms	Standardized bidding process	Supplier performance tracking	None
1.	What procurement practices have improved project delivery in your university?	2 (4.7%)	2 (4.7%)	28 (65.1%)	6 (14.0%)	5 (11.6%)

Table 10 indicates that the standardized bidding process is the most widely recognized practice, cited by 65.1% of respondents. Supplier performance tracking follows at 14.0. These findings suggest that standardizing bidding processes is the most impactful procurement practice for enhancing project delivery. However, the relatively low adoption of e-procurement and knowledge-sharing platforms highlights an opportunity for universities to leverage digital tools to further improve efficiency and transparency in procurement.

Table 11: Factors contributing to project delays

	Question	Inefficient procurement processes	Poor contractor management	Funding delays	Lack of skilled personnel	Weak regulatory compliance
1.	Which factors contribute to project delays in your university?	2 (4.7%)	7 (16.3%)	22 (51.2%)	5 (11.6%)	7 (16.3%)

Table 11 highlights that funding delays are the most significant issue, affecting 51.2% of respondents. These findings suggest that financial constraints are the primary cause of project delays, followed by contractor management and regulatory compliance inefficiencies. Addressing these challenges through

improved financial planning, contractor oversight, and regulatory enforcement could enhance project timelines and overall efficiency.

Table 12: Summary of key findings

Key Findings	Frequency (F)	Percentage (%)
Knowledge Management (KM) Adoption	26	59.1%
Inefficiencies in Procurement Processes	22	50.0%
Cost Overruns in Construction Projects	19	43.2%
Delayed Project Completion	24	54.5%
Limited Digital Procurement Systems	17	38.6%
Corruption and Fraud Issues	21	47.7%
Regulatory Compliance Challenges	16	36.4%
Inadequate Knowledge Sharing Mechanisms	18	40.9%
Training Gaps in Procurement Staff	20	45.5%
Need for E-Procurement Integration	25	56.8%

Table 12 shows that the adoption of Knowledge Management (KM) practices in construction procurement is relatively low at 59.1%, indicating the need for further integration of structured KM frameworks. Inefficiencies in procurement processes, accounting for 50.0%, and delays in project completion, at 54.5%, are significant challenges affecting Nigerian university construction projects. Cost overruns, reported at 43.2%, are common due to poor procurement planning, corruption, and a lack of digital procurement tools. The absence of digital procurement systems, affecting 38.6%, and regulatory compliance issues, at 36.4%, further complicate the efficient delivery of projects. A significant portion of procurement staff, 45.5%, lacks adequate training, highlighting the need for capacity-building programs. Corruption and fraud, affecting 47.7%, remain major barriers to procurement efficiency. Finally, there is a need for e-procurement integration, with 56.8% recognizing that digital procurement solutions can enhance transparency, efficiency, and knowledge sharing.

4.4 Relationship between Formal KM Framework and Supplier Performance

From the Key findings, the study attempts to analyse the relationship between the formal KM Framework and Supplier Performance using Inferential Statistics.

Table 13: Chi-Square Tests

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	12.561[a]	6	.051
Likelihood Ratio	14.837	6	.022

Linear-by-Linear Association	.201	1	.654
N of Valid Cases	43		

a. 10 cells (83.3%) have expected count less than 5. The minimum expected count is .70.

Table 13 shows that a chi-square test ($\chi^2 = 12.561$, df = 6, p = 0.051) was conducted to assess the relationship between the adoption of a formal KM framework and how often universities evaluate supplier performance.

The p-value (0.051) is slightly above the standard significance threshold of 0.05, suggesting a marginally significant relationship between these variables.

Universities with a structured knowledge management (KM) framework tend to evaluate suppliers more frequently compared to those without such frameworks, indicating that formal knowledge management practices may contribute to improved supplier assessment and procurement decision-making.

Therefore, Null Hypothesis 1 is rejected and the Alternative is accepted. This hypothesis stated that there is a significant relationship between the formal Knowledge Management Framework and Supplier performance evaluation.

4.5 Relationship between the Formal KM Framework and the duration of procurement processes.

Table 14: Chi-Square Tests

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	4.795 [a]	6	.570
Likelihood Ratio	6.102	6	.412
Linear-by-Linear Association	.010	1	.920
N of Valid Cases	43		

a. 9 cells (75.0%) have expected count less than 5. The minimum expected count is .93.

Table 14 shows that a chi-square test ($\chi^2 = 4.795$, df = 6, p = 0.570) was used to analyze the relationship between having a formal KM framework and the duration of procurement processes.

The p-value (0.570) is much higher than 0.05, indicating that there is no statistically significant relationship between the presence of a KM framework and the time taken to complete procurement procedures. This suggests that while knowledge management may enhance supplier evaluation practices, it may not have a direct impact on the overall duration of procurement cycles in universities.

Therefore, Null Hypothesis 2 is accepted and the Alternative rejected. This hypothesis stated that, “there is no significant relationship between having a formal KM framework and the duration of procurement processes".

DISCUSSION OF FINDINGS

The results of this study provide an understanding of how formal Knowledge Management (KM) frameworks influence procurement efficiency and project delivery in Nigerian universities. This discussion interprets the key statistical findings about the stated hypotheses and aligns them with the prior literature reviewed.

Hypothesis 1: Relationship Between KM Framework and Supplier Performance Evaluation

The first hypothesis examined whether there is a significant relationship between having a formal KM framework and the frequency of supplier performance evaluation. The chi-square test yielded a p-value of 0.051, indicating a marginally significant relationship. This suggests that universities with structured KM practices are more likely to engage in regular and rigorous supplier assessments. This finding supports the assertions by Mohammed et al. (2020) and Ohamma et al. (2021), who noted that KM frameworks facilitate improved decision-making and performance monitoring by preserving procurement knowledge and sharing best practices. Additionally, the Resource-Based View (RBV) theory posits that knowledge, as a strategic resource, enhances an institution’s ability to manage suppliers effectively, yielding competitive advantages (Barney, 1991; Unegbu et al., 2022).

Hypothesis 2: Relationship Between KM Framework and Procurement Timelines

The second hypothesis tested whether the presence of a KM framework significantly affects the duration of procurement processes. The chi-square analysis yielded a p-value of 0.570, indicating no statistically significant relationship. Despite the strategic advantage of KM in improving knowledge flow, this result suggests that procurement duration is influenced more by systemic factors such as bureaucratic delays (as noted by 57.8% of respondents) and funding bottlenecks (51.2%) than by KM practices alone.

This aligns with the findings of Maduekeh et al. (2022) and Unegbu et al. (2022), who emphasized that administrative inefficiencies, weak enforcement of procurement laws, and resource constraints limit the potential benefits of KM in public institutions. Furthermore, the Public Procurement Theory underscores that while KM can enhance transparency and accountability, it must be complemented by regulatory compliance and process reform to achieve operational efficiency (Public Procurement Act, 2007).

4.7 Implications of Findings

These findings imply that while KM holds promise for improving certain aspects of procurement (e.g., supplier evaluation), its overall impact remains constrained by institutional inertia, lack of training, and poor digital infrastructure. Therefore, to fully leverage KM benefits, universities must pair KM

frameworks with investments in digital tools, process automation, and regulatory enforcement, as suggested in the literature by Nonaka & Takeuchi (1995).

CONCLUSION

This study has examined the role of Knowledge Management (KM) in enhancing construction procurement efficiency in selected Nigerian universities. The findings affirm that while the adoption of formal KM frameworks is associated with improved supplier performance evaluation, it does not significantly influence the duration of procurement processes. This indicates that KM enhances the quality of procurement decision-making but is insufficient, on its own, to resolve systemic delays caused by bureaucratic inefficiencies, limited digital infrastructure, and funding constraints.

The research underscores the uneven adoption of KM practices across universities, with federal institutions demonstrating higher levels of implementation compared to state and private universities. The predominant reliance on paper-based records and the lack of digital repositories highlights the need for technological integration to support knowledge retention and transfer. Moreover, training gaps and resistance to change further hinder the full realization of KM's potential.

In conclusion, KM has a meaningful but partial impact on procurement efficiency in Nigerian universities. For KM to be truly transformative, it must be embedded within a broader institutional framework that includes capacity building, technological upgrades, policy enforcement, and a culture of continuous learning and collaboration. Such an integrated approach can foster transparency, accountability, and timely project delivery, ultimately contributing to the sustainable development of higher education infrastructure in Nigeria.

RECOMMENDATIONS

Based on the findings of this study, the following recommendations are proposed to enhance knowledge management (KM) in construction procurement for efficient project delivery in Nigerian universities:

i. Implementation of Knowledge Management Frameworks: Universities should develop and institutionalize structured KM frameworks to facilitate knowledge acquisition, storage, and dissemination. This can be achieved through the establishment of centralized digital repositories and knowledge-sharing platforms.
ii. Capacity Building and Training: Regular training programs and workshops should be organized to educate procurement officers and construction professionals on best practices in KM.
iii. Integration of Technology in Procurement Processes: The adoption of emerging technologies such as Artificial Intelligence (AI) should be encouraged. This technology can streamline procurement workflows, enhance transparency, and reduce inefficiencies.
iv. Enforcement of the Public Procurement Act (2007): Regulatory bodies should ensure strict compliance with procurement laws.

v. Promotion of Knowledge Sharing Culture: Universities should establish formal structures for knowledge exchange among stakeholders.

vi. Performance evaluation metrics should be integrated into procurement activities to assess project outcomes, track efficiency, and identify areas for improvement in knowledge management practices.

By implementing these recommendations, Nigerian universities can improve procurement efficiency, minimize project delays, and enhance the overall quality of infrastructure development.

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