Unpacking Barriers to Knowledge Management in Quantity Surveying: An Empirical Analysis from Kaduna State

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Received: 16/02/2025 **Revised: 18/04/2025** **Accepted: 29/05/2025**

Knowledge Management (KM) is essential to professional services such as quantity surveying, where the ability to capture, store, and reuse knowledge directly influences project success, decision-making, and organisational learning. However, KM practices in the Nigerian construction industry, particularly among Quantity Surveyors, remain underdeveloped and poorly institutionalised. This study investigates the barriers affecting KM implementation among registered Quantity Surveyors in Kaduna State, Nigeria. A structured questionnaire was administered to 201 professionals, with 120 valid responses (59.70% response rate). The study employed Exploratory Factor Analysis (EFA), mean score ranking, and Cronbach's alpha reliability testing to analyse the data and uncover underlying patterns. Two principal categories of KM barriers emerged: Knowledge Management Barriers and Cultural and Structural Barriers. The most critical challenges identified include the absence of clear KM metrics, weak knowledge retention strategies, fragmented knowledge repositories, and a lack of leadership commitment to KM. The results show that technical and managerial issues pose greater constraints to KM than cultural or behavioural resistance. These findings highlight the importance of addressing systemic weaknesses to promote sustainable knowledge practices. Theoretically, the study supports the applicability of the SECI model and Knowledge-Based View in emerging market contexts by demonstrating how technical limitations obstruct the externalisation and integration of knowledge. Practically, the study recommends the development of ICT-supported KM platforms, integration of KM key performance indicators into project appraisals, and the implementation of mentorship programmes to retain tacit knowledge. This study provides empirical insights that are valuable for researchers, industry practitioners, and policymakers aiming to institutionalise KM in Nigeria's professional services sector. It contributes to the limited body of knowledge on KM barriers in sub-Saharan Africa and lays the groundwork for context-specific KM frameworks that can enhance performance, competitiveness, and innovation in the quantity surveying profession.

Keywords: Knowledge Management, Nigerian Construction Industry, Organisational Performance, Quantity Surveying, Tacit Knowledge.

Introduction

Knowledge Management (KM) is increasingly recognised as a strategic resource for enhancing performance in knowledge-intensive professions such as quantity surveying. In this field, effective KM supports critical activities like cost estimation, risk management, and process standardisation, all of which are essential for achieving project success and organisational competitiveness (Egbu, 2004; Egbu *et al.*, 2005). While global research has highlighted KM's transformative potential, its application in the Nigerian construction sector remains fragmented and underexplored, particularly within the quantity surveying profession in subnational contexts like Kaduna State.

Despite ongoing discourse on the benefits of KM, significant challenges continue to hinder its effective implementation in Nigerian quantity surveying firms. These challenges include inadequate IT infrastructure, a lack of leadership support, and cultural resistance to knowledge sharing (Ismail *et al*., 2020; Cabrera & Cabrera, 2002). However, a deeper and more contextualised understanding of these barriers, specifically how they manifest among registered Quantity Surveyors in Kaduna State, has yet to be established. Most existing studies focus on KM practices in developed economies or examine the Nigerian construction sector at a broad level, overlooking location-specific organisational, technological, and cultural dynamics.

To address this gap, the present study investigates the underlying barriers to effective KM among registered Quantity Surveyors in Kaduna State, Nigeria. Grounded in Nonaka and Takeuchi's (1995) SECI model—which explains knowledge creation through the dynamic interaction of tacit and explicit knowledge—and the Knowledge-Based View (KBV) of the Quantity Surveyors, this study explores how structural, managerial, and cultural barriers obstruct the flow and utilisation of knowledge within quantity surveying practices. These theoretical lenses provide a foundation for analysing how internal organisational systems and individual behaviours interact to shape KM outcomes.

The study adopts a survey-based approach to identify and categorise these barriers, employing exploratory

factor analysis and mean score ranking to determine their relative significance. By focusing on a specific professional group and geographic region, the research offers novel empirical evidence on the KM challenges faced by quantity surveyors operating in Kaduna State's construction industry. The findings are expected to contribute to a more nuanced understanding of KM implementation in Nigeria, offering practical insights for professional bodies, policymakers, and organisational leaders aiming to enhance knowledge-based performance in the construction sector.

Overview of Knowledge Management (KM) Theories and Models

Knowledge Management (KM) encompasses processes for capturing, storing, disseminating, and applying knowledge to achieve organisational goals (Nonaka & Takeuchi, 1995). The SECI model—Socialisation, Externalisation, Combination, and Internalisation—offers a foundational understanding of how tacit and explicit knowledge interact dynamically within organisations. Socialisation transfers tacit knowledge through shared experiences; externalisation converts it into explicit knowledge (e.g., manuals); combination integrates various explicit knowledge sources; and internalisation reabsorbs them into individuals through application.

While the SECI model has been widely cited, its application in developing contexts like Nigeria often fails to consider infrastructural and cultural barriers that inhibit knowledge conversion (Egbu *et al.*, 2005; Cabrera & Cabrera, 2002). Furthermore, the Knowledge-Based View (KBV) highlights that organisational success stems from the firm's capacity to manage knowledge as a strategic resource (Hassan & Nisar, 2021). However, this assumes supportive leadership and technology conditions that are often absent in Nigerian QS practices.

Despite their usefulness, these models lack operational specificity for professional services in resource-constrained environments. Thus, this study adapts the SECI model to the quantity surveying context by exploring how barriers affect each stage of knowledge conversion—particularly the shift from tacit to explicit knowledge (externalisation), where many practicing Quantity Surveyors struggle due to individual reluctance and poor documentation practices (Kianto *et al*., 2022).

Categories of barriers to knowledge management

Individual-level barriers

Individual resistance remains a recurring challenge. Professionals often avoid knowledge sharing due to fear of losing competitive advantage or job security (Garavan *et al*., 2020). In Nigeria, this behaviour is exacerbated by poor incentives, lack of trust, and job instability (Kianto *et al*., 2022). Globally, similar concerns have been found among knowledge workers in high-competition sectors (Yadav & Mishra, 2024). However, some studies (e.g., Alavi & Leidner, 2023) suggest that when leadership creates a psychologically safe environment, such resistance can be mitigated—an area that Nigerian studies underexplores.

Organisational and structural barriers

A prominent barrier in both global and Nigerian contexts is the absence of structured KM systems. For example, Martins and Meyer (2023) observe that in the Quantity surveying practice in Nigeria, knowledge is often retained in silos, with minimal documentation. Compared to global practice that relies on codification strategies (Zhang & Cheng, 2022), Nigerian organisations depend on interpersonal knowledge exchange, making them vulnerable to turnover and staff mobility. The lack of leadership support further undermines KM adoption (Chawla & Joshi, 2020). While developed countries often have C-suite roles dedicated to knowledge and innovation (e.g., Chief Knowledge Officers), such structures are rare in Nigeria (Raheem & Abdallah, 2022).

Technological barriers

Poor infrastructure and limited investment in IT remain critical issues in Nigeria's construction sector. Where international Quantity Surveying practice deploys advanced KM platforms (e.g., BIM-integrated systems), Nigerian Quantity Surveying practice struggles with basic access to collaborative tools (Ismail et al., 2020). Recent advances in cloud-based KM platforms (Ali & Maguire, 2022) are promising but require contextual adjustments for low-resource settings.

Synthesis and comparative analysis

While both global and Nigerian studies agree on the importance of leadership, culture, and infrastructure, they diverge in the relative impact of these barriers. In developed contexts, technological barriers are often secondary to behavioural ones (Zhang & Cheng, 2022), whereas in Nigeria, they are often foundational—i.e., technology must be in place before behaviour can be addressed. Moreover, cultural issues like hierarchical rigidity and patronage influence knowledge flow more significantly in Nigeria (Jibril & Musa, 2025), while flatter structures in developed countries facilitate faster knowledge circulation.

Additionally, studies disagree on whether resistance stems more from a lack of trust or a lack of incentives. Some Nigerian studies emphasise economic motivation (Ismail *et al*., 2020), while others highlight leadership and cultural conditioning (Garavan et al., 2020). This study interrogates both by empirically ranking their impact using factor analysis.

The figure below adapts the SECI model to illustrate how knowledge flows are hindered by specific categories of barriers in the quantity surveying context.

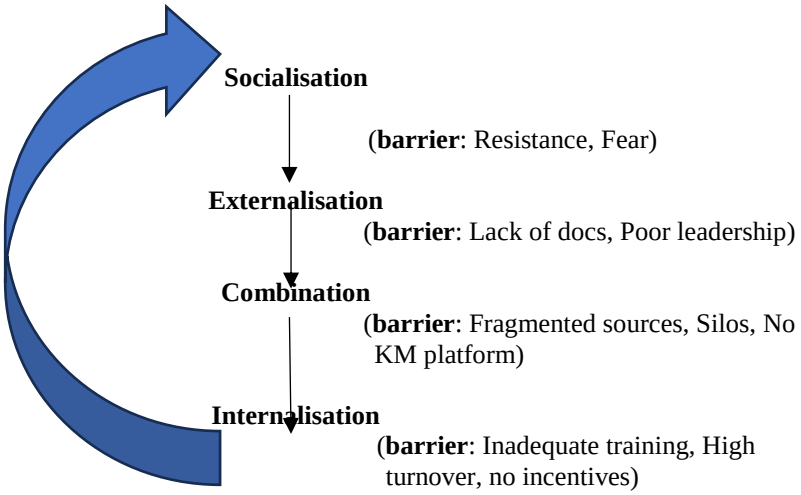

Figure 1: Conceptual Framework – Adapted SECI Model for Quantity Surveying in Nigeria

Research Methodology

This study employed a descriptive survey design, which is appropriate for systematically gathering quantifiable data on professionals' perceptions and experiences regarding barriers to Knowledge Management (KM). The design enables the identification of patterns and relationships across a defined population (Creswell & Creswell, 2018). It was chosen for its effectiveness in capturing cross-sectional insights into KM practices among Quantity Surveyors in a natural setting without manipulation.

The study population consisted of all registered practising Quantity Surveyors in Kaduna State, drawn from official registers of the Nigerian Institute of Quantity Surveyors (NIQS) and the Quantity Surveyors Registration Board of Nigeria (QSRBN). At the time of the study, 416 Quantity Surveyors were identified as eligible participants. Using the sample size determination table developed by Bartlett, Kotrlik, and Higgins (2001), a minimum required sample size of 201 was calculated.

Out of the 201 selected professionals, 120 completed and returned the questionnaire, yielding a response rate of 59.70%, which exceeds the threshold of 50% generally accepted for organisational research (Baruch & Holtom, 2008). A simple random sampling technique was adopted to reduce sampling bias and ensure that all registered Quantity Surveyors had an equal chance of selection.

The research instrument was a structured questionnaire containing 21 items related to potential barriers to KM. These items were derived from an extensive review of existing literature on KM barriers in both global and Nigerian contexts (e.g., Raheem & Abdallah, 2022; Hassan & Nisar, 2021; Ismail et al., 2020). The questionnaire focused on themes such as organisational infrastructure, leadership, training, cultural resistance, and technological limitations.

Before deployment, the instrument underwent pre-testing with 10 Quantity Surveyors not included in the main sample. Feedback from the pre-test helped refine the wording, clarity, and relevance of each item, ensuring face and content validity. The refined version of the questionnaire was then finalised for distribution.

Data were collected over six weeks, from September to October 2023, using a combination of email distribution and in-person administration. Participation was voluntary. Respondents were informed of the study's purpose, and each was required to provide informed consent before completing the questionnaire. Confidentiality was assured, and no personally identifiable information was collected or used in the analysis.

The study received ethical clearance from the Kaduna State University Research Ethics Committee, which reviewed and approved the data collection protocols to ensure participant welfare, data protection, and adherence to research ethics guidelines.

The collected data were analysed using Exploratory Factor Analysis (EFA), mean score ranking, and reliability assessment (Cronbach's alpha). EFA was conducted using SPSS Version 25 to identify underlying structures among the 21 KM barrier items. EFA is appropriate in this context because the study aimed to explore the dimensional structure of KM barriers without predefined constructs, a typical scenario in exploratory research (Yong & Pearce, 2013). For better understanding of the perceived significance or impact of the barriers, a ranking of these barriers was conducted by the use of mean score (MS) to ascertain which of these barriers has a high impact down to the least impact.

The formula for the mean score used is:

$$MS = \frac{\sum n.p}{N}$$

Where:

- MS = Mean Score,
- n = weighting number of the scale,
- p = probability distribution of the respondent,
- N = total number of respondents.

The decision rule on the Likert scale on the mean score is:

Ameyaw (2015), Mean Score <1.50 = very low, 1.5 – 2.49 = low, 2.50-3.49 = moderate, 3.5-4.49 = high then > 4.50 = very high.

Results and Discussion

Exploratory factor analysis (EFA)

Twenty-one (21) items were subjected to principal component analysis (PCA) using SPSS version 25. Before performing PCA, the suitability of the data for factor analysis was assessed. The inspection of the correlation matrix revealed the presence of many coefficients of 0.4 and above. Below are the findings. Table 2 shows the KMO and Bartlett's Test for the hindering factors, where the Kaiser-Meyer-Olkin Measure of Sampling Adequacy value is 0.936, which exceeds the recommended minimum value of 0.6 (Kaiser, 1970, 1974). Bartlett's Test of Sphericity (Bartlett, 1954) was statistically significant, supporting the factorability of the correlation matrix. Table 3 reveals the presence of two components from the PCA with eigenvalues exceeding 1, explaining 71.82% and 12.64% of the variance, respectively. Inspecting the scree plot showed a clear break after the second component. Using Cattell's (1996) scree test, two components were retained for further investigation. To help interpret these components, Oblimin rotation was performed. The rotated solution demonstrated a simple structure (Thurstone, 1947), with all components showing strong loadings and all variables loading substantially on the two components. The two-component solution explained 84.46% of the variance, with Component 1 contributing 71.82% and Component 2 contributing 12.64%. The interpretation of these components is shown in Table 4.

Therefore, the Exploratory Factor Analysis was conducted using Principal Component Analysis (PCA) with Oblimin rotation, appropriate for identifying latent constructs among correlated variables. The Kaiser-Meyer-Olkin (KMO) value was 0.936, and Bartlett's Test of Sphericity was significant (χ^2 = 5135.261, p < .001), confirming the data's suitability for factor analysis (Yong & Pearce, 2013).

Table 2: KMO and Bartlett's Test for Barriers to Knowledge Management

KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.936
Bartlett's Test of Sphericity	Approx. Chi-Square	5135.261
	df	210
	Sig.	.000

Table 3: Total Variance Explained for the Barriers to Knowledge Management

Total Variance Explained

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total
1	15.083	71.822	71.822	15.083	71.822	71.822	12.420
2	2.655	12.642	84.463	2.655	12.642	84.463	12.790
3	.961	4.574	89.037				

Extraction Method: Principal Component Analysis.

a. When components are correlated, the sums of squared loadings cannot be added to obtain a total variance.

Two components with eigenvalues greater than 1 were extracted and named as follows:

- Component 1: Knowledge Management Barriers (71.82% variance explained)
- Component 2: Cultural and Structural Barriers (12.64% variance explained)

Together, they account for 84.46% of the total variance, indicating a robust factor structure. See Figure 1.

Theoretical interpretation

The emergence of two components supports the dual influence of technical-managerial and socio-cultural structures on KM implementation—concepts central to both the SECI model and Knowledge-Based View (KBV):

- Component 1 aligns with externalisation and combination phases in SECI, where knowledge documentation, retention, and integration are obstructed by poor infrastructure, leadership gaps, and siloed systems.
- Component 2 reflects socialisation and internalisation barriers, emphasising individual motivation, cultural attitudes, and organisational learning.

Notable loadings

- High employee turnover loaded negatively (-0.626), suggesting its inverse relationship with other Knowledge Management variables. This implies that as KM systems become stronger (e.g., more platforms, documentation), turnover becomes more disruptive due to lost tacit knowledge, highlighting the fragility of KM processes in volatile staffing environments (Kianto *et al*., 2022).

Table 4: Rotated Component Matrix[a] for the Barrier to Knowledge Management

Observed Variables of The Barrier to Knowledge Management in Quantity Surveying Practice in Nigeria	Component	
	1	2
Lack of top management support	.946	
Lack of knowledge retention strategies	.944	
Absence of knowledge-sharing platforms	.939	
Lack of infrastructure	.928	
Siloed departments	.907	
Lack of leadership in Knowledge management	.901	
Fragmented knowledge sources	.875	
No clear metrics or evaluation criteria	.868	
Lack of standard processes	.856	
Geographic Dispersion	.731	
High employee turnover	-.626	
Organization Culture		.974
Inadequate information technology		.974
Lack of Incentives		.971
Fear of losing power or job security		.969
Lack of time management during project execution		.961
Ignorance of management and employees		.945
Insufficient funding		.925
Resistance to the sharing of experience		.910
Inadequate training programs		.899
Difficulty in acknowledging intellectual capacity		.859

Extraction Method: Principal Component Analysis.
Rotation Method: Oblimin with Kaiser Normalisation.
a. Rotation converged in 10 iterations.

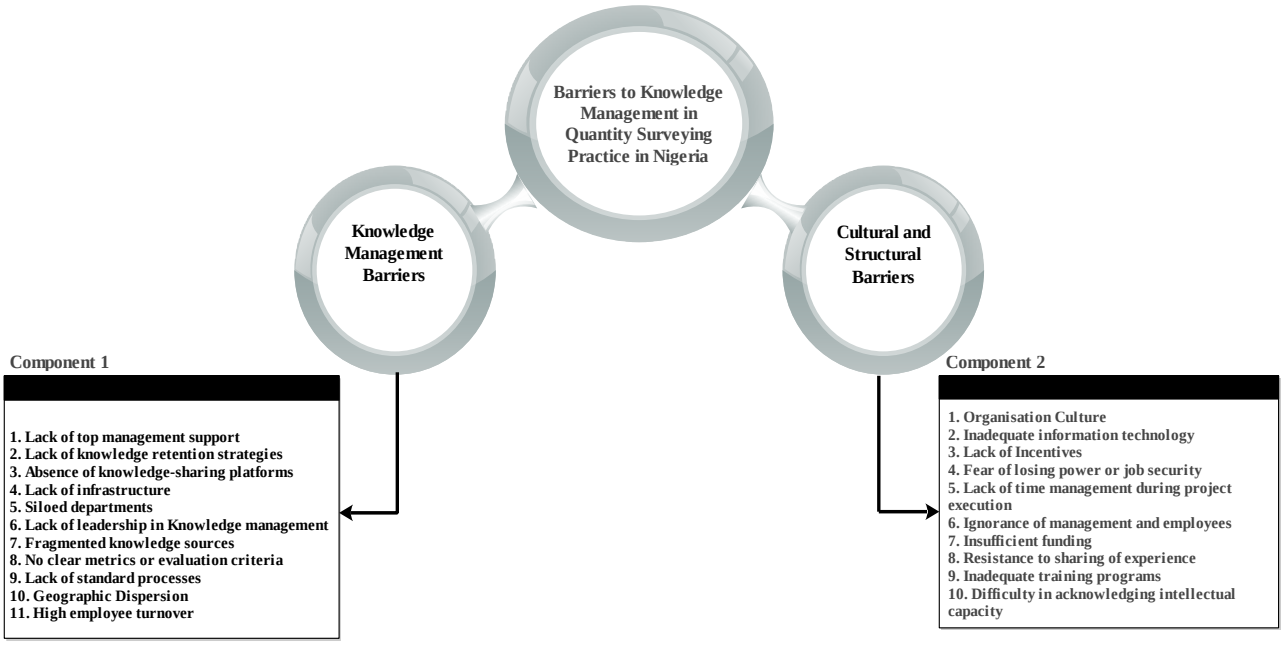

Figure 1: Barriers to Knowledge Management in Quantity Surveying Practice in Nigeria.

Cronbach's alpha generally accepts a measure for scale reliability of 0.7 as a cut-off value (Nunnally & Bernstein, 1994). However, Moss *et al*. (2020) noted that a Cronbach's alpha value above 0.6 is generally acceptable. Similarly, Nagpal *et al*. (2019) suggested that for subscale measures, a cut-off value of 0.6 is adequate. Anelli *et al*. (2020) further explained that a value ≥0.7 indicates high reliability; 0.5 to <0.7, moderate reliability; >0.2 to <0.5, fair reliability; and ≤0.2, low reliability. In this study, the Cronbach alpha coefficients for the Knowledge Management Challenge Factor and the Cultural and Structural Challenge Factor were all above 0.7 (see Table 5). The Cronbach alpha coefficients for the two factors or scales were thus deemed to indicate high reliability.

Table 5: Reliability test of the hindering factors of Knowledge Management

S/No	Factors	No. of Items	Cronbach's Alpha	Decision
1	Knowledge Management Barriers	11	0.929	high reliability
2	Cultural and Structural Barriers	10	0.986	high reliability

Table 6 presents the results of the mean score values of knowledge management barriers. The factors are ranked based on their mean scores (MS), with higher scores indicating greater perceived significance or impact. Looking at Table 6, the following are the findings:

In general view, the knowledge management (KM) barrier factor has a higher average mean score (4.17) than the cultural and structural barrier factor (3.70). These carry several critical implications. It suggests that technical and managerial obstacles—such as the absence of KM platforms, lack of clear leadership, inadequate knowledge retention strategies, and non-existent evaluation metrics—are perceived as more pressing and disruptive to KM practices than issues related to culture, training, or resistance to change.

This result implies that quantity surveying professionals are willing to share knowledge but are limited by systemic and infrastructural shortcomings, not merely behavioural reluctance. This aligns with Egbu *et al*. (2005), who noted that in developing economies, technical capacity deficits often supersede cultural resistance as the dominant KM barrier. Similarly, Ismail et al. (2020) and Kianto *et al*. (2022) argue that the effectiveness of KM depends not just on organisational culture but also on the availability of robust tools, leadership, and structured processes.

Table 6: Mean Score Ranking of The Barriers to Knowledge Management

Factors	Mean Score	Average MS
Knowledge Management		4.17
Lack of infrastructure	3.90	
Lack of top management support	3.97	
Lack of standard processes	3.77	
Absence of knowledge sharing platforms	4.10	
Lack of knowledge retention strategies	4.50	
Fragmented knowledge sources	4.33	
Geographic Dispersion	3.97	
High employee turnover	4.17	
Siloed departments	4.30	
Lack of leadership in Knowledge management	4.33	
No clear metrics or evaluation criteria	4.53	
Cultural and Structural		
Inadequate information technology	3.47	3.70
Resistance to sharing of experience	3.27	
Difficulty in acknowledging intellectual capacity	3.43	
Lack of time management during project execution	3.87	
Insufficient funding	3.90	
Organization culture	3.40	
Ignorance of management and employees	3.87	
Lack of Incentives	3.57	
Fear of losing power or job security	4.07	
Inadequate training programs	4.13	

The top five ranked KM barriers, grouped by factor category.

The bar chart visually presents the five highest-ranked barriers to Knowledge Management (KM) among Quantity Surveyors in Kaduna State, based on their mean scores. These barriers are classified into two overarching categories:

- Knowledge Management (KM) Barriers (technical/managerial), shown in solid filled, and
- Cultural and Structural Barriers, shown in textured hatching.

These top-ranking barriers fall under the Knowledge Management Barrier category and reflect the absence of formalised systems to measure, manage, and lead KM initiatives. This suggests that the most urgent KM challenges are strategic and technical, rather than behavioural. While Lower-ranked yet Significant barriers belong to the Cultural and Structural category and reflect human behavioural concerns and capacity issues. While significant, their lower rankings suggest that cultural resistance is secondary to systemic gaps. This aligns with findings by Egbu *et al*. (2005), who observed that in developing contexts, cultural issues are often symptoms of broader strategic and infrastructural deficiencies.

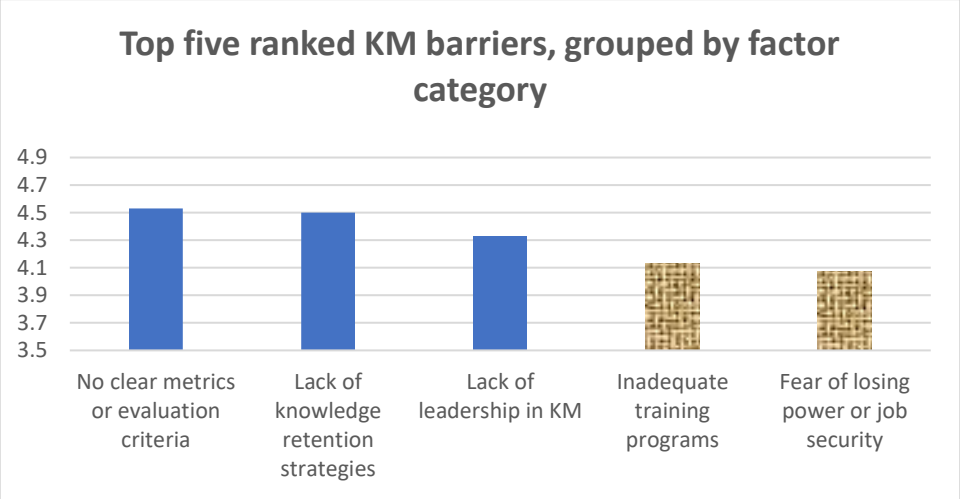

Figure 2: A bar chart of the top five ranked KM barriers, grouped by factor category

Contextual insight

In Nigerian QS practices, lack of training reduces the ability of professionals to internalise and apply knowledge effectively—linking this challenge to the internalisation phase of the SECI model. Meanwhile, fear of knowledge loss affecting job security stems from low trust environments, as highlighted by Kianto *et al*. (2022), which impedes socialisation (the sharing of tacit knowledge).

Overall implication

The bar chart highlights a clear dominance of technical/managerial KM barriers over cultural ones. This means:

- The KM failure is not primarily attitudinal, but structural and strategic.
- Cultural resistance is likely exacerbated by the absence of enabling systems, such as formal training, leadership commitment, and digital platforms.
- Effective KM in this context requires systemic reform first, followed by cultural transformation—a finding echoed by Donate and de Pablo (2015).

Conclusion

This study examined the barriers to effective Knowledge Management (KM) among Quantity Surveyors in Kaduna State, Nigeria. Drawing on data from 120 respondents and analysed using Exploratory Factor Analysis and mean score ranking, the findings revealed two core categories of barriers: Knowledge Management Barriers and Cultural and Structural Barriers. Technical and managerial challenges—such as the lack of KM platforms, poor leadership, inadequate retention strategies, and unclear performance metrics—ranked as more significant than cultural resistance or behavioural factors. This highlights the urgent need for system-level interventions to address structural and strategic weaknesses that undermine knowledge sharing and retention. Theoretically, the study contributes to the Knowledge Management discourse by reinforcing the relevance of the SECI model and Knowledge-Based View (KBV) in a developing professional services context, showing how systemic barriers hinder the conversion and integration of knowledge. These results bridge a gap in the KM literature by contextualising established theories in a low-resource, profession-specific environment.

Based on these findings, the study recommends the implementation of ICT-enabled KM platforms, the

integration of KM metrics into project and staff performance reviews, and the initiation of mentorship programmes to preserve and transfer tacit knowledge. Leadership capacity must also be strengthened to promote a culture of knowledge sharing, and continuous KM training should be institutionalised. However, the study has limitations, including its focus on a single geographic area—Kaduna State—which limits the general applicability of the results. Future research should address these limitations by conducting comparative studies across states or regions, employing qualitative case studies for deeper insights into organisational KM strategies, and applying longitudinal approaches to assess the impact of KM interventions over time. Such efforts would further advance the development of context-specific KM models for the Nigerian construction and professional services sectors.

From the SECI model perspective (Nonaka & Takeuchi, 1995), the high impact of KM barriers reflects disruptions in the externalisation and combination stages of knowledge conversion. These stages require strong systems for transforming tacit knowledge into explicit forms (e.g., documentation, processes) and then integrating this knowledge across departments. Without such systems, knowledge remains fragmented, undocumented, and underutilised.

Similarly, the Knowledge-Based View (KBV) posits that knowledge is a key organisational asset that must be managed strategically through leadership and infrastructure (Hassan & Nisar, 2021). The study's findings highlight a disconnect between knowledge as a resource and the systems required to mobilise it, thus limiting competitive advantage.

Strategic priority: Efforts to improve KM in the Nigerian quantity surveying sector should prioritise systemic and managerial enablers, including leadership buy-in, KM frameworks, and performance measurement tools.

Capacity building: Organisations must invest in affordable and context-appropriate KM platforms, which can serve as foundations for more advanced practices.

Secondary gains: Addressing technical and structural gaps could have indirect benefits for culture, as structured KM environments have been shown to promote transparency, reduce hoarding, and build trust.

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