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IMPACT OF BUILDING INFORMATION MODELLING ON CONSTRUCTION PROJECT PERFORMANCE IN NIGERIA

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ABSTRACT

Building Information Modelling (BIM) has become a transformative digital technology for improving construction project delivery; however, empirical evidence on its impact in Nigeria remains limited. This study examined the impact of BIM on construction project performance by assessing awareness, adoption, perceived benefits, and barriers to implementation among construction professionals. A mixed-methods research design was employed, involving a questionnaire survey of 529 construction professionals across Lagos, Abuja, Port Harcourt, Kano, and Enugu. A total of 515 valid responses were analysed, representing a 97.4% response rate, while qualitative insights were obtained through interviews with 15 BIM experts. Quantitative data were analysed using descriptive statistics, and qualitative data were subjected to thematic analysis. The findings revealed a moderately high level of BIM awareness (overall mean = 3.39), with awareness of the BIM concept recording the highest mean score (3.54). BIM adoption was highest for design visualization and quantity take-off, while advanced applications such as 4D scheduling and facility management remained limited. Respondents agreed that BIM positively influences project performance (overall mean = 3.44), particularly in design quality (3.55) and collaboration (3.47). The principal barriers were the absence of a national BIM policy (3.88), inadequate technical skills (3.78), and high software costs (3.75). The study concludes that strengthening policy support, professional capacity, and organizational investment is essential for accelerating BIM adoption and improving construction project performance in Nigeria.

KEYWORDS: Building Information Modelling (BIM); construction project performance; BIM adoption; digital transformation; Technology Acceptance Model; Nigeria.

INTRODUCTION

The construction industry is a major contributor to economic growth, infrastructure development, and employment generation worldwide. Despite its strategic importance, the industry continues to experience persistent challenges, including project delays, cost overruns, material wastage, poor quality delivery, and inadequate coordination among project stakeholders. These challenges have negatively affected project performance and limited the industry's contribution to sustainable development, particularly in developing countries (Umar et al., 2023). As construction projects become increasingly complex, the demand for innovative technologies that improve efficiency, collaboration, and decision-making has continued to grow. Among these innovations, Building Information Modelling (BIM) has emerged as one of the most transformative digital technologies in the Architecture, Engineering, and Construction (AEC) industry (Olawumi & Chan, 2020).

Building Information Modelling is an integrated digital process that enables the creation, management, and exchange of project information throughout the lifecycle of a facility. Unlike conventional design approaches, BIM facilitates real-time collaboration among project stakeholders by integrating architectural, structural, engineering, scheduling, and cost information into a shared digital environment. This integrated approach improves project visualization, minimizes design conflicts, enhances communication, supports informed decision-making, and reduces construction errors and material waste (Abubakar et al., 2023). Consequently, BIM has become an important tool for improving project delivery by enhancing cost efficiency, schedule adherence, quality performance, and stakeholder collaboration.

The benefits of BIM have been widely demonstrated in developed economies where governments and industry stakeholders have integrated digital technologies into construction practices. Countries such as the United Kingdom and Singapore have institutionalized BIM through national standards and public procurement requirements, resulting in improved project coordination, reduced rework, enhanced cost predictability, and better construction quality (Saka et al., 2020). Similarly, several African countries, including South Africa, Kenya, and Ghana, have recorded increasing levels of BIM adoption on major infrastructure and commercial projects, demonstrating its potential to improve multidisciplinary collaboration and project efficiency (Akinlolu et al., 2021). However, BIM implementation across many developing countries remains constrained by inadequate digital infrastructure, shortage of skilled professionals, high implementation costs, and weak institutional support (Saka et al., 2020).

Nigeria's construction industry continues to face many of the challenges that BIM is designed to address. Project delays, budget overruns, poor coordination among project participants, and quality deficiencies remain common features of construction projects despite increasing investments in infrastructure development (Oyewobi et al., 2022). Although awareness of BIM has improved among construction professionals, its practical application remains limited and is often confined to three-dimensional visualization during the design stage. More advanced applications, such as project scheduling, cost management, facility management, and lifecycle information management, are rarely implemented (Abubakar et al., 2023). The slow pace of BIM adoption has been attributed to several factors, including high software acquisition and training costs, limited technical expertise, organizational resistance to change, inadequate digital infrastructure, and the absence of a comprehensive national BIM implementation framework (Saka et al., 2020).

Despite increasing scholarly attention to BIM adoption in Nigeria, important knowledge gaps remain. Existing studies have largely focused on professionals' awareness of BIM, perceived benefits, and barriers to adoption, while relatively little empirical evidence exists regarding the extent to which BIM adoption influences construction project outcomes within the Nigerian context (Abubakar et al., 2023; Oyewobi et al., 2022). Furthermore, limited attention has been given to examining how barriers to BIM adoption affect project performance, particularly in terms of cost efficiency, time performance, quality delivery, and collaboration among construction professionals. This lack of empirical evidence limits the ability of policymakers, professional bodies, and construction firms to develop effective strategies for accelerating digital transformation within the Nigerian construction industry.

This study addresses these gaps by examining the impact of Building Information Modelling on construction project outcomes in Nigeria. Specifically, the study assesses the level of BIM awareness among construction professionals, identifies the barriers affecting BIM adoption, evaluates the influence of these barriers on project performance, and proposes strategies for improving BIM implementation within the Nigerian construction industry. The findings are expected to contribute to the growing body of knowledge on digital transformation in construction while providing practical evidence to support policy formulation, professional capacity development, and the wider adoption of BIM for improved construction project performance in Nigeria.

LITERATURE REVIEW

Building Information Modelling and Construction Project Performance

Building Information Modelling (BIM) has transformed the global construction industry by providing an integrated digital platform for planning, designing, constructing, and managing built assets throughout their lifecycle. Unlike conventional two-dimensional design methods, BIM integrates geometric, technical, financial, and operational information into a shared digital environment that facilitates collaboration among project stakeholders. The technology enables architects, engineers, quantity surveyors, contractors, and clients to access real-time project information, thereby improving coordination, minimizing design conflicts, and supporting informed decision-making (Abou-Ibrahim & Hamzeh, 2021).

The adoption of BIM has been associated with significant improvements in construction project performance. Studies have shown that BIM enhances project visualization, improves communication among multidisciplinary teams, reduces design errors, minimizes material waste, and supports accurate cost estimation and scheduling (Olawumi & Chan, 2020). Its multidimensional capabilities, including three-dimensional visualization (3D), scheduling (4D), cost estimation (5D), and lifecycle management (6D), enable project teams to identify potential construction challenges before physical implementation, thereby reducing rework and improving project efficiency (Latiffi et al., 2021).

Project performance in construction is commonly evaluated using indicators such as cost efficiency, timely completion, quality of work, and stakeholder satisfaction (Adeleke et al., 2023). Research indicates that organizations implementing BIM consistently achieve better project outcomes than those relying solely on conventional project delivery methods. Improved information sharing and integrated project planning reduce uncertainties during construction, leading to better schedule adherence and enhanced quality performance (Enshassi & El-Ghandour, 2023). Consequently, BIM is increasingly recognized as a strategic tool for improving construction productivity and promoting sustainable infrastructure development.

Although BIM adoption has expanded rapidly in developed economies, implementation in many developing countries remains limited. The slow pace of adoption has been linked to inadequate digital infrastructure, shortage of skilled professionals, high implementation costs, organizational resistance to change, and weak policy support (Saka et al., 2023). These constraints are particularly evident in Nigeria, where BIM implementation remains at an early stage despite increasing awareness among construction professionals (Abubakar et al., 2023).

Theoretical Foundation

This study is anchored on the Technology Acceptance Model (TAM) developed by Davis (1989). TAM explains technology adoption by proposing that an individual's intention to use a technology is primarily influenced by two factors: Perceived Usefulness and Perceived Ease of Use. Perceived usefulness refers to the extent to which users believe that a technology improves their job performance, while perceived ease of use relates to the degree to which the technology is considered simple and effortless to use (Venkatesh & Davis, 2000).

The model has been extensively applied to explain the adoption of digital technologies in the construction industry. Previous studies have shown that professionals are more willing to adopt BIM when they perceive it as capable of improving project coordination, reducing errors, and enhancing productivity (Mahamadu et al., 2021). Conversely, inadequate training, high implementation costs, poor management support, and organizational resistance reduce users' willingness to adopt BIM despite recognizing its potential benefits (Akinlolu et al., 2021).

The Technology Acceptance Model is particularly relevant to this study because BIM adoption in Nigeria remains voluntary and largely depends on professionals' perceptions of its usefulness and ease of implementation. The model therefore provides an appropriate theoretical framework for understanding how awareness, organizational factors, and adoption barriers influence BIM implementation and ultimately affect construction project performance.

Empirical Review

Empirical studies consistently demonstrate that BIM contributes positively to construction project performance. Olawumi and Chan (2020) reported that management commitment, stakeholder collaboration, and government support were among the most important factors influencing successful BIM implementation. Similarly, Latiffi et al. (2021) found that organizations with higher BIM maturity achieved better cost control, fewer design conflicts, and improved adherence to project schedules.

Research conducted in developed economies also indicates that BIM enhances productivity through improved collaboration and information sharing. Abou-Ibrahim and Hamzeh (2021) observed that BIM significantly reduced rework and improved communication among project stakeholders, resulting in shorter construction periods and better project outcomes. Likewise, Alenezi and Almalki (2022) identified top management support, client requirements, and anticipated cost savings as key drivers of BIM adoption, while high implementation costs and shortage of skilled personnel remained major constraints.

Studies conducted within Africa reveal similar findings. Akinlolu et al. (2021) found that BIM improved multidisciplinary coordination and reduced design conflicts in South African construction projects, although adoption remained significantly higher among large organizations than small and medium-sized firms. In Kenya, Maina et al. (2022) reported that BIM integration improved project scheduling efficiency but highlighted interoperability challenges resulting from the use of incompatible software platforms.

In Nigeria, empirical evidence indicates that BIM awareness has increased considerably, yet practical implementation remains relatively low. Abubakar et al. (2023) found that although many construction professionals were familiar with BIM concepts, actual application was constrained by inadequate technical expertise, high software acquisition costs, limited client demand, and weak government support. Similarly, Oyewobi et al. (2022) established a positive relationship between BIM adoption and improvements in project cost control, schedule performance, and quality delivery but observed that these benefits were more evident among multinational construction firms than indigenous organizations. Other studies have emphasized the influence of organizational culture, professional competence, policy support, and digital infrastructure on successful BIM implementation in Nigeria (Aghimien et al., 2022; Abdullahi et al., 2022).

Overall, the empirical literature suggests that BIM has significant potential to improve construction project performance. However, its successful implementation depends on supportive organizational structures, adequate professional capacity, and enabling institutional policies.

RESEARCH GAP

Although previous studies have demonstrated the potential benefits of Building Information Modelling, several gaps remain within the Nigerian literature. First, many studies have concentrated on BIM awareness and adoption barriers without comprehensively examining how these factors influence project performance outcomes such as cost efficiency, time performance, quality, and stakeholder collaboration (Abubakar et al., 2023). Second, limited studies have applied the Technology Acceptance Model to explain BIM adoption behaviour within the Nigerian construction industry, thereby restricting theoretical understanding of professionals' adoption decisions. Third, most existing studies have relied predominantly on quantitative survey methods, providing limited qualitative insights into the institutional and organizational factors influencing BIM implementation (Adebayo & Ibrahim, 2022).

This study addresses these gaps by integrating quantitative and qualitative evidence to examine the relationship between BIM awareness, adoption barriers, and construction project outcomes in Nigeria. By applying the Technology Acceptance Model, the study provides a more comprehensive understanding of the factors influencing BIM adoption and offers practical recommendations for improving digital transformation within the Nigerian construction industry.

METHODOLOGY

This study adopted a mixed-methods research design to investigate the impact of Building Information Modelling (BIM) on construction project outcomes in Nigeria. The mixed-methods approach combines the strengths of quantitative and qualitative research, enabling a more comprehensive understanding of complex research problems than either approach alone (Creswell & Creswell, 2018; Saunders et al., 2019). While the quantitative component generated measurable evidence on BIM awareness, adoption, barriers, and project performance, the qualitative component provided contextual insights into the practical experiences of construction professionals regarding BIM implementation.

The study targeted professionals within Nigeria's Architecture, Engineering, and Construction (AEC) industry, including architects, civil engineers, builders, quantity surveyors, project managers, and construction firm executives. These professionals were selected because they are directly involved in project planning, design, coordination, and execution and therefore possess the technical knowledge required to evaluate BIM implementation and its influence on project performance. Similar respondent groups have been employed in previous BIM adoption studies within Nigeria and other developing economies (Oyewobi et al., 2022; Abubakar et al., 2023; Adeleke et al., 2023). The study covered major construction hubs in Nigeria, namely Lagos, Abuja, Port Harcourt, Kano, and Enugu, where BIM awareness and construction activities are relatively more advanced.

The study population comprised approximately 25,000 registered construction professionals, based on membership records obtained from the Council for the Regulation of Engineering in Nigeria (COREN), the Nigerian Institute of Architects (NIA), the Nigerian Institute of Quantity Surveyors (NIQS), and the Nigerian Institute of Building (NIOB). The required sample size was determined using the Yamane (1967) sample size determination formula with a 95% confidence level and a 5% margin of error, resulting in a minimum sample of 529 respondents. The Yamane formula is widely applied in social science and construction management research because it provides an efficient method for determining representative sample sizes from finite populations (Yamane, 1967; Saunders et al., 2019). In addition, 15 BIM experts and project managers were purposively selected for semi-structured interviews to obtain in-depth perspectives on BIM implementation, adoption challenges, and strategies for improving project performance.

A stratified random sampling technique was employed for the questionnaire survey to ensure adequate representation of the major professional groups within the AEC industry. The study population was first stratified according to professional discipline before respondents were randomly selected from each stratum in proportion to its population size. Stratified sampling improves representativeness and minimizes sampling bias in heterogeneous populations (Saunders et al., 2019). For the qualitative component, purposive sampling was adopted to select interview participants with substantial knowledge and practical experience in BIM implementation. This approach ensured that the interview data reflected informed professional opinions capable of complementing the quantitative findings (Creswell & Creswell, 2018).

Primary data were collected using a structured questionnaire and semi-structured interviews, which are among the most widely adopted instruments in construction management and technology adoption research (Abubakar et al., 2023). The questionnaire was developed from established BIM adoption literature and organized into five sections covering respondents' demographic characteristics, BIM awareness, BIM adoption, project performance, and barriers to implementation. Responses were measured using a five-point Likert scale ranging from Strongly Disagree (1) to Strongly Agree (5), a scale that has been extensively applied in studies examining technology adoption and organizational behaviour (Oyewobi et al., 2022). Semi-structured interviews were conducted with selected BIM professionals to explore issues relating to organizational readiness, implementation challenges, policy support, and strategies for enhancing BIM adoption in Nigeria's construction industry.

To ensure the quality of the research instruments, the questionnaire and interview guide were subjected to expert review by specialists in construction management and research methodology to establish content validity. Thereafter, a pilot survey involving 20 construction professionals was conducted to assess the clarity, relevance, and comprehensibility of the questionnaire before the main survey. The reliability of the questionnaire was evaluated using Cronbach’s Alpha, yielding a reliability coefficient of 0.84, which exceeds the minimum threshold of 0.70 recommended for establishing acceptable internal consistency in social science research (Hair et al., 2019). The pilot study also provided an opportunity to refine ambiguous items and improve the overall quality of the research instrument.

Quantitative data were analysed using the Statistical Package for the Social Sciences (SPSS) Version 25. Descriptive statistical techniques, including frequencies, percentages, mean scores, and standard deviations, were employed to summarize respondents' characteristics and evaluate BIM awareness, adoption, barriers, and project performance indicators. These descriptive techniques are appropriate for analysing perception-based survey data and have been widely applied in BIM and construction management studies (Adeleke et al., 2023). The qualitative interview data were transcribed verbatim and analysed using thematic analysis, which involved coding responses, identifying recurring themes, and interpreting patterns across participants' experiences (Braun & Clarke, 2006). The integration of quantitative and qualitative findings through methodological triangulation enhanced the credibility, validity, and robustness of the study's conclusions (Creswell & Creswell, 2018).

Ethical principles were observed throughout the study. Participants were informed of the objectives of the research, their participation was entirely voluntary, and informed consent was obtained before data collection commenced. Respondents were assured of confidentiality and anonymity, and all information obtained during the study was used exclusively for academic purposes in accordance with accepted research ethics (Saunders et al., 2019).

RESULTS AND DISCUSSION

Response Rate and Respondents' Profile

A total of 529 questionnaires were distributed to construction professionals across Lagos, Abuja, Port Harcourt, Kano, and Enugu. Of these, 515 valid questionnaires were retrieved and used for analysis, representing an effective response rate of 97.4%, which exceeds the minimum response rate generally considered adequate for construction management surveys. The high response rate enhances the reliability and generalizability of the study findings.

Table 1.0: Questionnaire Distribution and Response Rate.

Location	Distributed	Valid Responses	Response Rate (%)
Lagos	185	172	93.0
Abuja	130	123	94.6
Port Harcourt	95	89	93.7
Kano	70	65	92.9

Enugu	49	46	93.9
Total	**529**	**515**	**97.4**

Source: Field Survey (2025).

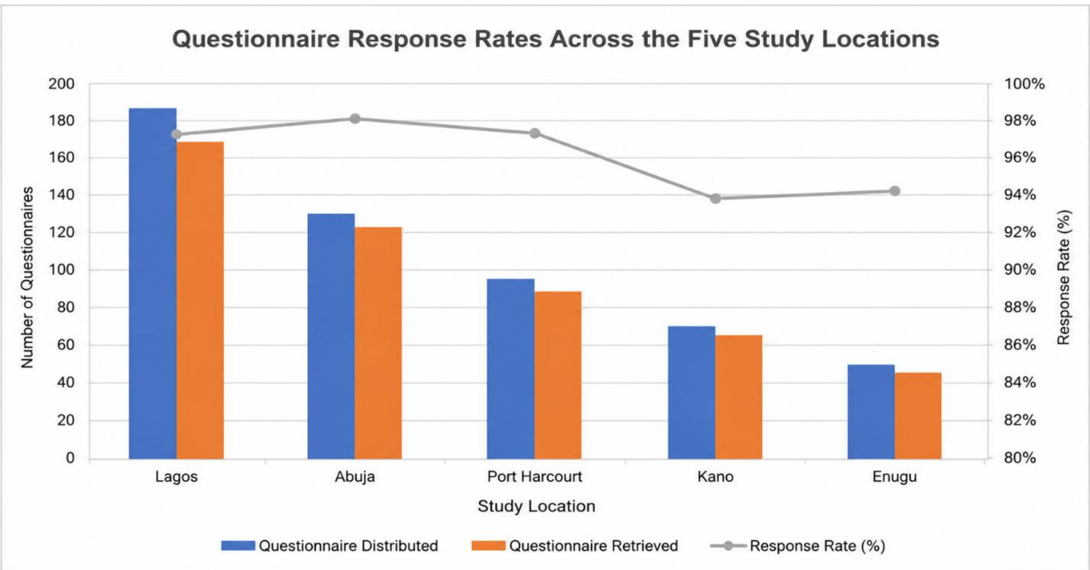

Figure 1.0: Questionnaire response rates across the five study locations.

Source: Field Survey, 2025

The wide geographical spread of respondents indicates that the findings reflect perspectives from the major construction centres in Nigeria, thereby reducing regional bias and improving the representativeness of the survey. Similar nationwide sampling approaches have been adopted in BIM studies by Oyewobi et al. (2022) and Abubakar et al. (2023).

Level of BIM Awareness among Construction Professionals

The first objective examined the level of BIM awareness among construction professionals. The findings indicate an overall awareness mean score of 3.39, suggesting a moderate to high level of awareness. Awareness of the BIM concept recorded the highest mean score (3.54), whereas awareness of government and industry BIM initiatives (2.95) and BIM standards and protocols (2.99) recorded the lowest scores.

Table 2.0: Level of BIM Awareness.

Variable	Mean	Rank
Awareness of BIM concept	3.54	1
Knowledge of BIM software	3.26	2
Understanding of BIM workflow	3.21	3
BIM standards and protocols	2.99	4
Government BIM initiatives	2.95	5
Overall Mean	**3.39**	

Source: Field Survey (2025).

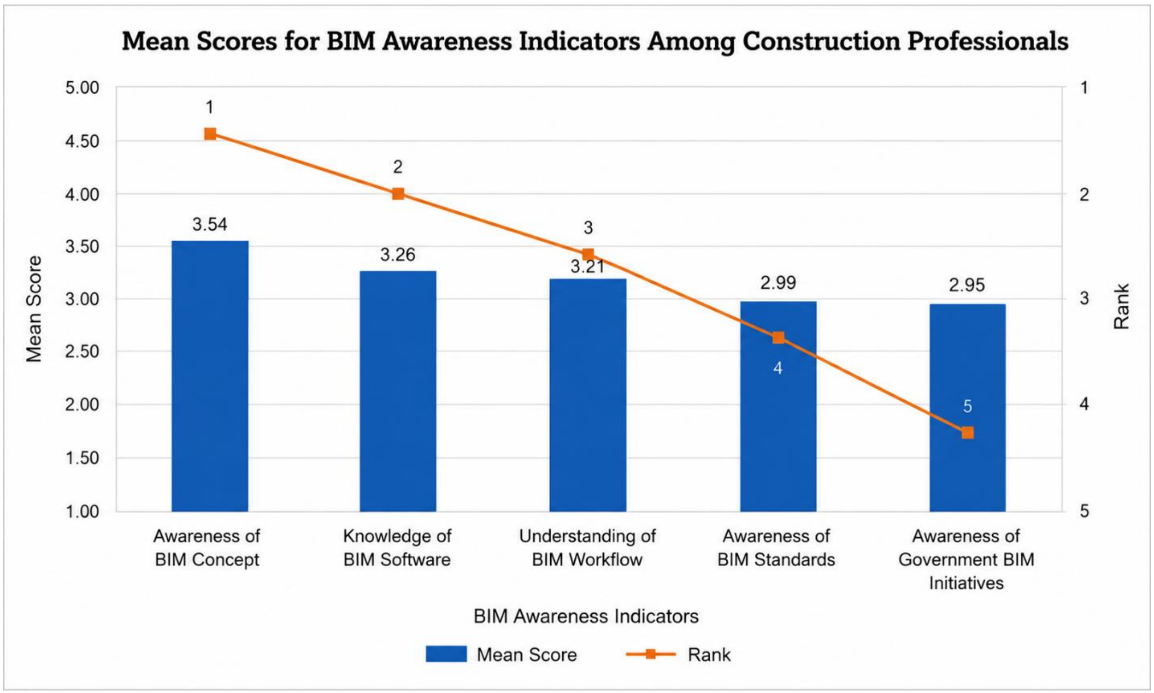

Figure 2.0: Mean scores for BIM awareness indicators among construction.

Source: Field Survey, 2025

The findings suggest that although construction professionals are familiar with BIM as a concept, awareness has not translated into comprehensive understanding of implementation standards and regulatory frameworks. This indicates that awareness is largely conceptual rather than operational.

These findings corroborate Abubakar et al. (2023), who reported relatively high BIM awareness but low practical implementation among Nigerian professionals. Similarly, Saka et al. (2023) argued that awareness alone does not guarantee adoption unless supported by institutional frameworks and professional capacity building. Within the Technology Acceptance Model, awareness contributes to perceived usefulness, which influences users' intention to adopt new technologies (Davis, 1989; Venkatesh & Davis, 2000).

BIM Adoption and Utilization

The second objective evaluated the extent of BIM adoption among construction firms. The results reveal that BIM adoption remains partial and uneven, with most organizations using it primarily for design visualization. In contrast, more advanced applications such as project scheduling, lifecycle management, and facility management remain limited. Adoption is concentrated in Lagos and Abuja, where large firms and multinational contractors are more active.

Table 3.0 Major BIM Applications.

BIM Application	Adoption Level
Design visualization	High
Quantity take-off	Moderate
Cost estimation	Moderate
Project scheduling (4D)	Low
Facility management	Very Low

Source: Field Survey (2025).

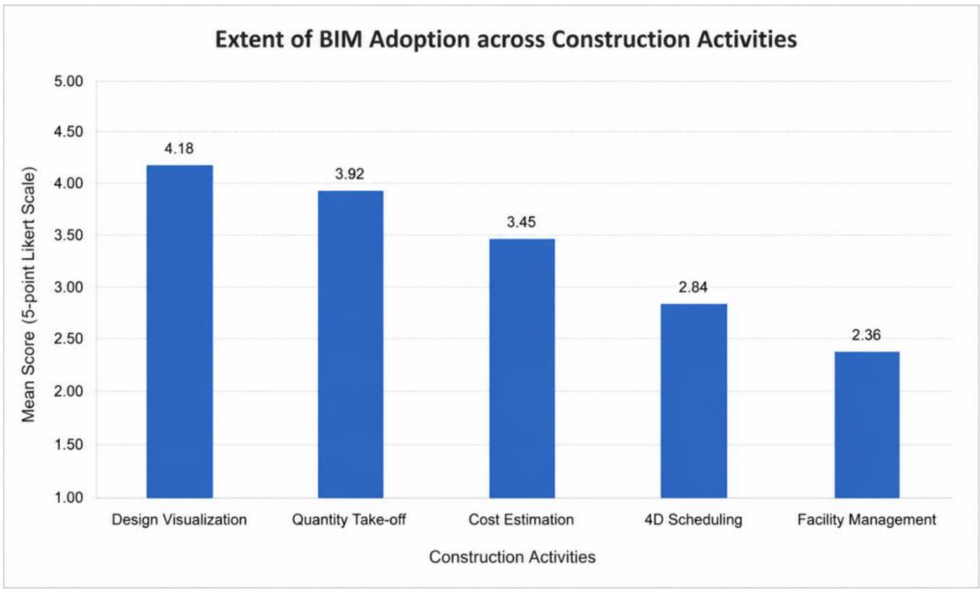

Figure 3.0: Extent of BIM adoption across major construction activities.

Source: Field Survey, 2025

The results demonstrate that Nigeria remains in the early stages of BIM maturity. Organizations have embraced BIM mainly for visualization rather than exploiting its full lifecycle capabilities.

These findings are consistent with Oyewobi et al. (2022), Abubakar et al. (2023), and Latiffi et al. (2021), who reported similar incremental adoption patterns in developing economies. According to the Technology Acceptance Model, these findings indicate that professionals recognize BIM's usefulness but perceive implementation as technically demanding, thereby reducing adoption.

Impact of BIM on Construction Project Outcomes

The third objective examined the perceived influence of BIM on project performance. Respondents generally agreed that BIM positively affects project outcomes, with an overall mean score of 3.44. The highest-rated benefits were improved design quality (3.55) and enhanced collaboration (3.47), followed by reduced rework and improved cost estimation.

Table 4.0: Perceived Impact of BIM.

Performance Indicator	Mean
Design quality	3.55
Collaboration	3.47
Reduced rework	3.45
Cost estimation	3.44
Project scheduling	3.38
Documentation	3.38

Source: Field Survey (2025).

The findings demonstrate that BIM contributes most strongly to improving design quality and multidisciplinary collaboration. These benefits arise from the technology's ability to integrate project information and facilitate early detection of design conflicts.

The results support previous studies by Abou-Ibrahim and Hamzeh (2021), Olawumi and Chan (2020), and Umar et al. (2023), which found that BIM enhances coordination, reduces errors, and improves project efficiency. From the TAM perspective, these positive perceptions strengthen perceived usefulness, thereby increasing professionals' willingness to adopt BIM.

Barriers to BIM Adoption

The fourth objective identified barriers hindering BIM implementation. Respondents perceived all investigated factors as moderate to severe barriers, with an overall mean score of 3.62. The most significant barriers were the absence of government policy (3.88), inadequate technical skills (3.78), and high software costs (3.75).

Table 5.0: Major Barriers to BIM Adoption.

Barrier	Mean	Rank
Lack of government policy	3.88	1
Insufficient technical skills	3.78	2
High software costs	3.75	3
Resistance to change	3.64	4
Poor interoperability	3.47	5
Weak collaboration	3.45	6
Low client demand	3.38	7

Source: Field Survey (2025).

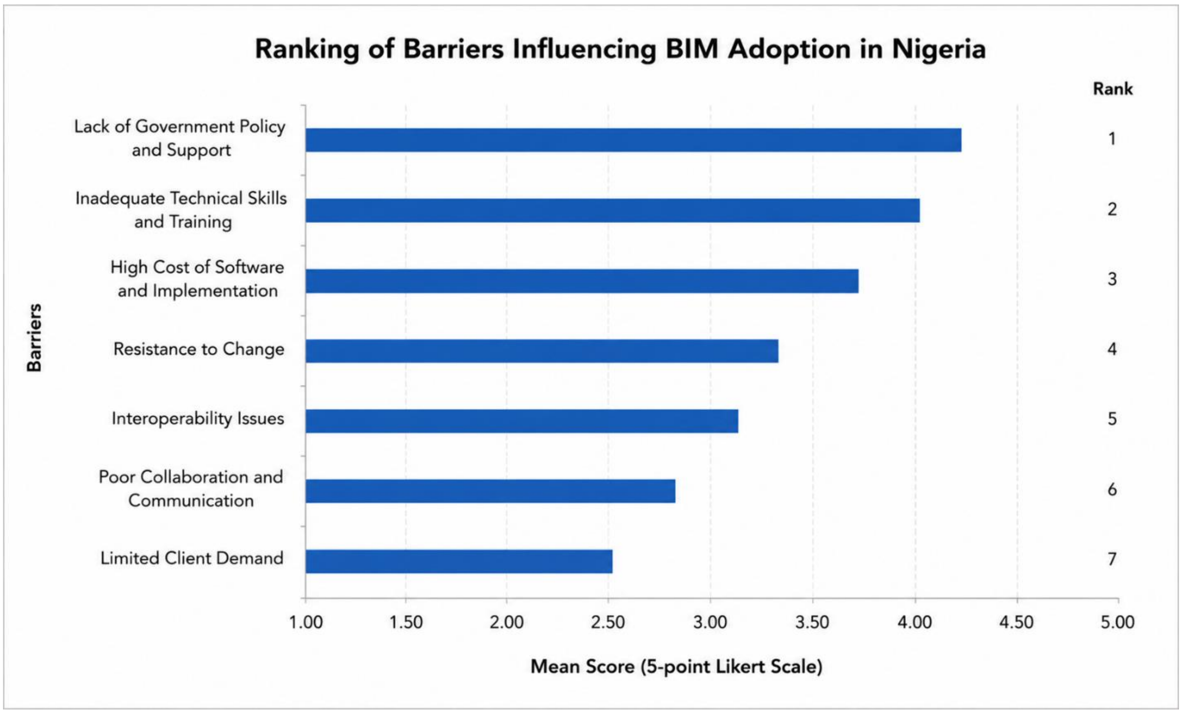

Figure 4.0: Ranking of barriers influencing BIM adoption in Nigeria.

Source: Field survey, 2025

These findings indicate that institutional and economic constraints are more influential than professional resistance. The absence of a national BIM implementation framework appears to be the most critical impediment to widespread adoption.

The results are consistent with Abubakar et al. (2023), Olawumi and Chan (2020), and Saka et al. (2023), who identified policy support, technical capacity, and affordability as key determinants of BIM diffusion. Under TAM, these barriers primarily reduce perceived ease of use, limiting professionals' behavioural intention to adopt BIM despite recognising its benefits.

Synthesis of Findings

The combined quantitative and qualitative evidence suggests that BIM awareness among Nigerian construction professionals is increasing, and respondents generally recognise its potential to improve project quality, collaboration, cost management, and scheduling. However, adoption remains constrained by inadequate institutional support, limited technical capacity, and financial barriers. Consequently, BIM implementation is largely driven by organisational initiatives rather than a coordinated national strategy. These findings underscore the need for policy reforms, capacity building, and stronger industry collaboration to accelerate digital transformation within Nigeria's construction sector.

CONCLUSION AND RECOMMENDATIONS

Conclusion

This study examined the impact of Building Information Modelling (BIM) on construction project outcomes in Nigeria using a mixed-methods approach grounded in the Technology Acceptance Model (TAM). Specifically, the study assessed the level of BIM awareness among construction professionals, evaluated the extent of BIM adoption, examined its perceived impact on construction project performance, and identified the barriers limiting its implementation.

The findings indicate that awareness of BIM among Nigerian construction professionals is moderately high, suggesting that the industry has moved beyond the introductory stage of digital transformation. However, awareness remains largely conceptual, with relatively low understanding of BIM standards, implementation protocols, and government-led initiatives. This suggests that increased awareness has not yet translated into widespread professional competence or institutional implementation.

The study further revealed that BIM adoption remains moderate and is concentrated primarily in design visualization, quantity take-off, and cost estimation. More advanced applications such as integrated project scheduling, clash detection, facility management, and lifecycle information management are still uncommon. This indicates that BIM implementation in Nigeria remains at an early stage of maturity compared with countries where BIM has become an integral component of project delivery.

Despite the relatively modest level of adoption, respondents generally agreed that BIM contributes positively to construction project performance. The strongest benefits identified include improvements in design quality, multidisciplinary collaboration, communication, cost estimation, and reduction of design conflicts and material wastage. These findings demonstrate that BIM has considerable potential to improve project efficiency, reduce project risks, and enhance overall construction performance within the Nigerian construction industry.

The study also established that BIM implementation continues to be constrained by institutional, financial, and technical barriers. The absence of a national BIM policy framework, inadequate professional training, high software acquisition costs, limited client demand, and insufficient organizational capacity were identified as the most significant obstacles to wider BIM adoption. These findings suggest that the slow pace of BIM implementation is driven more by systemic challenges than by resistance among construction professionals.

Viewed through the Technology Acceptance Model, the findings demonstrate that while construction professionals generally perceive BIM as a useful technology capable of improving project outcomes, several structural barriers reduce its perceived ease of use. Consequently, increasing awareness alone is unlikely to achieve widespread adoption unless supported by enabling policies, affordable technology, professional training, and stronger institutional commitment.

Overall, the study concludes that Building Information Modelling has significant potential to transform construction project delivery in Nigeria. However, realizing this potential will require coordinated efforts by government, professional institutions, educational establishments, and private construction firms to create an enabling environment for sustainable BIM implementation.

Recommendations

Based on the findings of this study, the following recommendations are proposed to promote the effective adoption of Building Information Modelling (BIM) and improve construction project performance in Nigeria.

1. Establish a National BIM Policy and Regulatory Framework

The Federal Government of Nigeria, in collaboration with relevant regulatory agencies and professional bodies, should develop and implement a comprehensive national BIM policy and regulatory framework. Such a framework should establish standardized guidelines for BIM implementation, promote consistency in project delivery, and encourage the integration of BIM into public procurement and infrastructure development projects.

2. Strengthen Professional Capacity and BIM Education

Professional institutions and higher education institutions should strengthen capacity-building initiatives through continuous professional development programmes, certification courses, and curriculum reforms. Integrating BIM into architecture, engineering, quantity surveying, building, and project management programmes will equip both current professionals and future graduates with the technical competencies required for effective BIM implementation.

3. Increase Organizational Investment in BIM Technologies

Construction firms should increase investment in BIM software, digital infrastructure, and staff training to enhance organizational readiness for digital project delivery. Organizations should also adopt change management strategies that encourage collaboration, knowledge sharing, and the gradual integration of BIM across all phases of the project lifecycle rather than limiting its application to design visualization.

4. Promote Multi-Stakeholder Collaboration and Incentives

Government agencies, professional bodies, clients, software vendors, and construction firms should establish collaborative partnerships to accelerate BIM adoption. This can be achieved through awareness campaigns, demonstration projects, subsidized software licensing, financial incentives, and industry-wide knowledge-sharing platforms that reduce implementation costs and encourage wider adoption, particularly among small and medium-sized construction firms.

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