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THE SPECIFIC RISK MANAGEMENT PRACTICES USED BY CONSTRUCTION FIRMS IN ABUJA, NIGERIA

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Abstract
The study aimed to assess the project risk management (PRM) practices utilized in the construction of high-rise buildings in Abuja and evaluate their direct impact on achieving project success (measured by time, cost, quality, and structural safety). This study employed a descriptive and correlational survey design within a quantitative framework. The population consists of construction professionals actively involved in the delivery of high-rise buildings. The primary instrument is a self-administered structured questionnaire. Descriptive Statistics: Mean scores, Standard Deviation, are used to rank the most critical risk factors and success criteria. The study shows that site inspections and checklists, SWOT analysis, documentation reviews and brainstorming and expert judgment were found to be moderately risk identification practices for the specific risk management practices used by construction firms ranked the most in the study area.. Also, the study shows that risk avoidance, risk transfer and risk mitigation was found to be moderately risk treatment and response practices for the specific risk management practices used by construction firms in the study area. The result also shows that risk registers, periodic risk audits and early warning systems were found to be moderately risk monitoring and control practices for the specific risk management practices used by construction firms in the study area respectively.It is recommended that management formalizes the risk management lifecycle by integrating risk registers and periodic audits into the mandatory project reporting structure, ensuring these are not treated as optional tasks but as essential decision-making tools. By providing targeted technical training on proactive response strategies like risk transfer and mitigation, firms can transition from a reactive moderate engagement to a robust, integrated risk culture that consistently protects project objectives.

Keys: Specific, Risk, Management, Practices, Construction Firms

Introduction
The construction of high-rise buildings represents the pinnacle of engineering complexity, characterized by high capital intensity, lengthy durations, and susceptibility to environmental and market fluctuations. Research indicates that such monumental projects are inherently risk-prone due to vertical delivery challenges, wind loads, and stringent safety requirements (Chauhan*et al.,* 2022; Paul & Xavier, 2024). While developed economies have integrated advanced Project Risk Management (PRM) frameworks and digital tools like Building Information Modeling (BIM) to achieve project success, many projects worldwide still suffer from cost overruns and delays because of inadequate quantitative risk analysis (Zhao, 2024; Kadir*et al.,* 2025). The global consensus underscores that the success of these vertical structures is directly proportional to the systematic identification and mitigation of technical and socio-economic risks from the project inception stage (Singh, 2025; Moza& Paul, 2024).
In Nigerian, the construction industry is a primary driver of the national economy, yet it is plagued by a high rate of project failure, abandonment, and structural collapses. The high-rise projects in Nigerian urban centers are particularly vulnerable to under resourced risk management where safety protocols and quality standards are often compromised to save costs (Akande*et al.,* 2024). The tragic incidents of building collapses in major cities like Lagos and Abuja serve as stark reminders of the disparity between professional standards and actual site practices (Uthman, 2022; Onochie,

2022). Scholars have noted that while the industry contributes significantly to the GDP, the absence of formal risk management protocols among indigenous firms remains a critical barrier to achieving consistent project performance (Butt *et al.*, 2021; Sadeghi*et al.,* 2022).

The consequences of these deficient risk management practices have been devastating, manifesting in a rise of structural failures and severe economic losses. Between January and July 2024 alone, the Council for the Regulation of Engineering in Nigeria (COREN) recorded 22 building collapses nationwide with Abuja identified as a major hotspot for such incidents (Okhueleigbe, 2023). Specifically, high-profile collapses such as the 2023 Gwarimpa collapse which claimed lives and the 2025 partial collapse in the Mabushi District have been directly linked to the compromise of engineering standards, use of substandard materials, and unauthorized vertical extensions (Goodluck*et al.,* 2025).Furthermore, there is a lack of recent empirical data on how modern digital risk tools, such as Building Information Modeling (BIM), are being integrated into the risk frameworks of Abuja-based firms to prevent the increasing trend of structural collapses This study seeks to fill the above gap by assessing specific risk management practices used by construction firms in Abuja, Nigeria.

Literature Review

Specific Risk Management Practices Used by Construction Firms

Construction firms operating in the high-rise sector of Abuja typically utilize a blend of qualitative and intuitive risk management practices that align with the complexity of vertical developments. According to Pirmah et al. (2021) and Shehu and Wang (2022), the most frequently deployed identification techniques include brainstorming sessions and expert interviews, which allow seasoned professionals to flag structural and environmental hazards unique to the Federal Capital Territory. Furthermore, Mohammed et al. (2021) highlight that safety risk assessment is a critical practice, with firms increasingly using risk prioritization numbers to evaluate the severity and probability of high-risk work items like lift installations and steel structural works. These practices are often documented in a project risk register, though the level of detail varies significantly between large-scale multinational firms and smaller indigenous contractors (Zailani*et al*., 2025).

In terms of risk response and control, firms in Abuja primarily rely on traditional financial and contractual mitigation strategies. Ayodele (2025) and Irfan*et al.* (2024) observe that risk transfer through comprehensive insurance policies and performance bonds is the dominant response for financial uncertainties, while technical risks are managed through regular site meetings and staged quality audits. Recent literature by Jegede*et al.* (2025) also notes an emerging trend toward digital monitoring, where Tier-1 firms incorporate Building Information Modelling (BIM) to simulate clash detections and identify technical risks before they manifest on-site. However, for the majority of projects, the "retention" of risk remains common, with firms setting aside a 10% contingency budget to absorb inflationary material costs and payment delays a practice that remains the primary safeguard against project abandonment in the region (Amade&Akpan, 2020; Shehu& Wang, 2022).

Risk identification practices

Risk identification is widely considered the most critical phase of the risk management cycle for high-rise projects in Abuja, as it lays the foundation for all subsequent mitigation strategies. According to Pirmah et al. (2021), the predominant practices among construction firms in the Federal Capital Territory are largely qualitative with a heavy reliance on brainstorming sessions and site inspections. These methods allow project teams to identify visible technical hazards and environmental constraints specific to the Abuja landscape, such as soil instability or logistical bottlenecks in the Central Business District. Furthermore, Shehu and Wang (2022) note that while formal tools like the Delphi Technique are recognized in academic circles, most practitioners favor

expert judgment and the review of historical project data to flag potential risks during the pre-contract stage.

Recent studies highlight a gradual shift toward more structured identification frameworks though adoption remains uneven across the industry. Jegede et al. (2025) observe that Tier-1 firms involved in high-rise developments are increasingly utilizing Checklist Analysis and Strengths, Weaknesses, Opportunities, and Threats (SWOT) analysis to categorize risks into financial, technical, and legal domains. However, Ayodele (2025) argues that a significant portion of indigenous firms still struggle with hidden risks such as fluctuating regulatory requirements or complex subsurface conditions which are often missed due to the lack of advanced sensing technologies or Geographic Information Systems (GIS). This reliance on traditional and manual identification processes often leads to a reactive management style where risks are only formally acknowledged once they begin to impact the project's critical path (Zailani et al., 2025; Amade&Akpan, 2020).

Risk assessment and analysis

Risk assessment and analysis in the Abuja construction industry is characterized by a transition from qualitative appraisals to semi-quantitative frameworks though the latter remains less frequent. According to Mohammed *et al.* (2021), the most pervasive practice among construction professionals is the use of the Probability-Impact (P-I) Matrix, which allows teams to rank risks based on their perceived likelihood and potential severity. This qualitative approach is favored for its simplicity and ease of communication during stakeholder meetings. However, Umar (2024) points out that this method is often criticized for its subjectivity as different professionals may assign varying scores to the same risk based on personal bias rather than empirical data. Consequently, the reliance on expert intuition during the analysis phase continues to dominate particularly in the assessment of technical risks for high-rise structures where structural complexity is high (Pirmah*et al.,* 2021).

Despite the growing complexity of high-rise developments in Abuja, the adoption of advanced quantitative analysis tools remains limited. Shehu and Wang (2022) observe that sophisticated techniques such as Monte Carlo Simulations, Sensitivity Analysis, and Decision Tree Analysis are rarely utilized by indigenous firms due to a lack of specialized software training and high computational costs. Research by Jegede*et al.* (2025) further suggests that while Tier-1 international firms operating in the FCT are beginning to integrate Building Information Modelling (BIM) for automated risk clash detection and 4D schedule analyses, the broader industry still struggles with data scarcity. Without accurate historical cost and time data, the ability to perform rigorous quantitative risk modeling is significantly hindered, often leading to inaccurate contingency forecasting and subsequent cost overruns (Ayodele, 2025; Zailani*et al.,* 2025).

Risk response strategies

Risk response strategies in the Abuja construction industry represent the decisive phase where professionals select specific actions to address identified and analyzed threats. According to Hassan *et al.* (2023) and Zailani*et al.* (2025), the most prevalent strategies among Nigerian construction firms are risk reduction (mitigation) and risk transfer. Risk reduction is typically achieved through rigorous site supervision, quality control audits, and regular stakeholder meetings to prevent technical errors before they escalate. Conversely, risk transfer remains a cornerstone of financial protection in the Federal Capital Territory; firms extensively utilize Contractor's All-Risk insurance and performance bonds to shift the financial burden of potential accidents or structural failures to third-party insurers (Ajemunigbohun&Adeoye, 2023; Shehu& Wang, 2022).

Despite the availability of diverse strategies, literature highlights an uneven application that often leans toward risk retention (acceptance) for critical economic variables. Ayodele (2025) and Irfan et al. (2024) observe that many Abuja-based contractors are forced to accept risks such as

hyper-inflation and material price fluctuations by maintaining informal contingency funds, as these risks are often deemed non-transferable in the local market. Furthermore, research by Jegede et al. (2025) suggests that risk avoidance the practice of refusing high-risk contracts is becoming more common among Tier-1 firms to protect their corporate reputation amidst Abuja's increasingly volatile economic climate. However, the lack of a standardized risk response framework often leads to unconscious retention where risks are neither transferred nor mitigated due to poor planning ultimately manifesting as the cost overruns and project abandonments prevalent in high-rise developments (Pirmah*et al.,* 2021; Umar, 2024).

Risk monitoring and control

Risk monitoring and control is the final and iterative stage of the risk management cycle focused on tracking identified risks, monitoring residual risks, and identifying new threats as the project evolves. In the context of Abuja, Shehu and Wang (2022) and Hassan et al. (2023) highlight that while monitoring is theoretically recognized as essential for the high-rise sector; its practical implementation often remains weak. Firms frequently rely on traditional weekly progress meetings and site supervisor reports as primary control mechanisms. However, as noted by Zailani et al. (2025), these methods are often reactive rather than proactive meaning that risks like structural settling or material price surges are typically addressed only after they begin to impact the critical path. Despite this, recent empirical evidence suggests that effective monitoring can reduce project cost overruns by up to 45%, making it the most influential factor in project cost performance among Abuja's estate developers.

The literature further identifies a significant gap in the adoption of automated or monitoring tools. According to Jegede*et al.* (2025) and Umar (2024), the lack of real-time data integration such as using Building Information Modelling (BIM) or specialized risk management software limits the ability of Abuja-based firms to conduct look-ahead risk audits. Instead, control measures are often limited to adjusting contingency buffers or implementing work stoppages when budget thresholds are breached. Furthermore, Aikpokhio*et al*. (2024) argue that the absence of a standardized risk reporting framework across the Federal Capital Territory (FCT) leads to inconsistent monitoring quality between project phases. To move beyond this, researchers emphasize the need for professional bodies like the NIOB and NIQS to mandate formal risk audit protocols that ensure continuous scanning of the complex social, economic, and technical environments inherent in vertical construction (Ayodele, 2025; Shehu& Wang, 2022).

Methodology

This study employed a descriptive and correlational survey design within a quantitative framework.The population consists of construction professionals actively involved in the delivery of high-rise buildings. This includes: Registered Architects (ARCON) Registered Builders (CORBON) Quantity Surveyors (NIQS) Project Managers and Civil Engineers (COREN).A sample of 300 respondents was used to achieve sufficient power for multivariate analysis.The primary instrument is a self-administered structured questionnaire. It is designed using a 5-point Likert Scale (ranging from 1 = Very Low to 5 = Very High) to measure the extent of risk management practices in the study area. Data analysis is conducted in two stages using SPSS v.29. Descriptive Statistics: Mean scores, Standard Deviation, are used to rank the most critical risk management practices.

Result and finding

Demographics result of the respondents was assessed by using the frequency analysis.

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Table 1: Demographics Result

S/N	Questions	Options	Frequency	Percentage
1	Age	30-45 years	95	35.2
		46-55 years	150	55.6
		56-65 years	25	9.2
		Total	**270**	**100.00**
2	Education	ND/HND	58	21.4
		B.Sc/B.Tech	135	50.1
		MSc/M.Tech	70	25.9
		PhD	7	2.6
		Total	**270**	**100.00**
3	Profession	Architecture	50	18.5
		Builders	70	25.9
		C/Engineers	102	37.8
		Quantity Survey	48	17.8
		Total	**270**	**100.00**
	Your Role	Project Manager/Director	58	21.5
		Project Engineer	78	28.9
		Site Supervisor/Foreman	52	19.3
		Client/Project Owner Representative	21	7.8
		Contractor	61	22.6
		Total	**270**	**100.00**

Table 1: Demographic Information of Respondents

The Table 1 reveals that age between 46-55 years of respondent constitutes the majority with 55.6% while age between 56-65 years of the respondent constitutes the minority with 9.2%. Then most of the respondents were B.Sc/B.Tech qualification with 50.1% and the least qualification of the respondent was PhD with only 2.6% respectively. The table also reveals that engineers constitute the majority of the profession with 37.8% in the study area. Project engineer constitutes the majority of the respondent in the project role.

The demographic profile suggests a survey population dominated by mid-career professionals with strong foundational technical expertise. With the majority of respondents falling into the 46–55 age brackets (55.6%) and holding B.Sc. or B.Tech. degrees (50.1%), the data implies a workforce that is highly experienced but perhaps more focused on practical implementation than academic research, given the very low representation of PhD holders (2.6%). The heavy concentration of engineers (37.8%) and the prevalence of project engineers in leadership roles indicate that the study's findings are likely grounded in technical project management and field execution. This combination of seniority and technical background suggests that the responses carry significant weight in terms of industry experience, though the minority of older participants (56–65 years) and highly specialized academics might indicate a potential gap in perspectives regarding late-career mentorship or high-level theoretical innovation.

The specific risk management practices used by construction firms in the study area.

Table 2 presents the result based on mean and standard deviation analysis.

Table 2: Specific Risk Management Practices Used by Construction Firms

Risk Management Practices	Mean	Std. Deviation	Rank	Remarks
Risk Identification Practices				
Site inspections and checklists	3.4775	1.47331	1	Moderate
SWOT analysis	3.3873	1.28238	2	Moderate
Documentation reviews	3.2958	1.34584	3	Moderate
Brainstorming and expert judgment	3.0704	1.35181	4	Moderate
Risk Analysis and Evaluation Practices				
Probability-impact (P-I) matrix	3.3239	1.30803	1	Moderate
Quantitative analysis	3.2993	1.32862	2	Moderate
Risk ranking	3.2570	1.26692	3	Moderate
Qualitative assessment	3.2113	1.34680	4	Moderate
Step-in rights	3.0352	1.39870	5	Moderate
Risk Treatment and Response Practices				
Risk avoidance	3.6972	1.23259	1	High
Risk transfer	3.6937	1.23028	2	High
Risk mitigation	3.5458	1.25031	3	High
Risk acceptance/retention	3.2113	1.35725	4	Moderate
Risk Monitoring and Control Practices				
Risk registers	3.1120	1.390	1	Moderate
Periodic risk audits	3.1101	1.350	2	Moderate
Early warning systems	3.0121	1.371	3	Moderate

Table 2: Risk Management Practices Used by Construction Firms

Table 2 shows that site inspections and checklists, SWOT analysis, documentation reviews and brainstorming and expert judgment with mean values of 3.4775, 3.3873, 3.2958 and 3.0704 were found to be moderately risk identification practices as the specific risk management practices used by construction firms ranked 1st and 4th in the study area. While probability-impact (P-I) matrix, quantitative analysis and risk ranking with mean values of 3.3239, 3.2993 and 3.2570 were found to be moderately risk analysis and evaluation practices for the specific risk management practices used by construction firms ranked 1st and 4th in the study area. Also, the Table shows that risk avoidance, risk transfer and risk mitigation with mean values of 3.6972, 3.6937 and 3.5458 and was found to be moderately risk treatment and response practices for the specific risk management practices used by construction firms ranked 1st and 3rd in the study area. The result also shows that risk registers, periodic risk audits and early warning systems with mean values of 3.1120, 3.1101 and 3.0121 were found to be moderately risk monitoring and control practices for the specific risk management practices used by construction firms ranked 1st and 3rd in the study area respectively.

Discussion of Finding

The findings indicate a strong preference for traditional, qualitative risk management methods within the construction firms studied. The moderate use of site inspections and checklists (mean=3.4775) and SWOT analysis (mean=3.3873) as primary identification tools aligns with the research of Enshassi and Mosa (2015), who found that construction professionals favor practical, experience-based identification over complex modeling. This focus on "visual" and "experiential" identification is typical in the industry because it allows for immediate site-level intervention. Furthermore, the moderate application of the Probability-Impact (P-I) matrix (mean=3.3239) for evaluation agrees with Zou*et al.* (2014), who noted that while P-I matrices are technically simple, they remain the most widely adopted analytical tool in developing construction markets due to their ease of communication among project stakeholders.

However, the results regarding risk treatment specifically the moderate scores for risk avoidance (mean=3.6972) and risk transfer (mean=3.6937) partially disagree with the findings of Akintoye and MacLeod (1997) and more recent studies by Rostami (2016), which often report that construction firms have a low appetite for avoidance due to competitive pressures. The relatively high mean values here suggest a more cautious approach to risk in the study area, possibly due to a volatile economic climate or high project complexity. Additionally, the lower mean for early warning systems (mean=3.0121) in the monitoring category highlights a significant weakness. This result agrees with Al-Bahar and Crandall (2014), who argued that many firms remain reactive rather than proactive, focusing heavily on initial identification and transfer while neglecting the continuous monitoring required to catch emerging risks before they escalate.

Conclusion and Recommendations

The study reveals that construction firms maintain a moderate level of engagement across all stages of the risk management lifecycle. While foundational practices like site inspections and SWOT analysis are the primary methods for identification, the use of P-I matrices and quantitative analysis for evaluation remains only moderately established. Similarly, response strategies (such as risk transfer and mitigation) and monitoring tools (like risk registers and audits) are utilized with moderate frequency. Overall, the findings suggest that while these specific practices are recognized and ranked as top priorities in the study area, there is significant room to move from moderate usage to a more robust integrated application of these techniques.

Construction firms should move beyond basic site inspections by institutionalizing more rigorous, data-driven techniques such as quantitative risk analysis and P-I matrices to enhance the accuracy of their evaluations. It is recommended that management formalizes the risk management lifecycle by integrating risk registers and periodic audits into the mandatory project reporting structure to ensure these are not treated as optional tasks but as essential decision-making tools. By providing targeted technical training on proactive response strategies like risk transfer and mitigation, firms can transition from a reactive moderate engagement to a robust integrated risk culture that consistently protects project objectives.

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