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Project Management Strategies And Project Success Of Construction Firms In Rivers State, Nigeria

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ABSTRACT: *This study investigates the influence of project management strategies, specifically quality management and risk management, on project success in the context of construction firms operating in Rivers State, Nigeria. The study conceptualizes project success in terms of two key dimensions: project quality compliance and project timeliness. Utilizing a structured survey and Partial Least Squares Structural Equation Modeling (PLS-SEM), data were analyzed from a sample of 152 project professionals across registered construction firms. The findings reveal that both quality and risk management strategies have statistically significant and positive effects on project success indicators. Specifically, quality management practices such as benchmarking, auditing, and continuous improvement positively influence both timeliness and quality compliance, while proactive risk identification, monitoring, and mitigation significantly reduce project delays and quality deviations. These results align with prior research across both local and international contexts. The study recommends that construction firms institutionalize structured quality and risk management frameworks to enhance their delivery outcomes and resilience.*

Keywords*:* Project Management Strategies; Quality Management; Risk Management; Project Success

1.0 Introduction

The construction industry is a major contributor to national development, providing essential infrastructure and employment opportunities. In Nigeria, particularly Rivers State, construction projects are pivotal to urbanization, industrialization, and socio-economic advancement. Despite its significance, the industry is plagued by persistent challenges such as cost overruns, delays, poor quality delivery, and outright abandonment of projects (Okereke & Okwu, 2022). These issues largely stem from ineffective project management strategies, raising the need for more robust mechanisms to ensure successful project execution.

Project success is often determined by factors such as quality compliance, timely delivery, budget adherence, and stakeholder satisfaction. Among these, quality and timeliness are critical indicators of performance (Ali et al., 2021). Construction firms in Rivers State face increasing pressure to deliver projects that meet international standards and are completed within expected timelines. This underscores the relevance of adopting and implementing efficient project management strategies.

Project management strategies encompass various structured methodologies aimed at improving project outcomes. Quality management strategy and risk management strategy have gained prominence for their roles in enhancing the reliability, predictability, and success of construction projects (Shah & Khan, 2023). Quality management strategies ensure compliance with standards, reduce defects, and increase client satisfaction. Risk management strategies, on the other hand, focus on identifying potential threats and devising proactive measures to mitigate them, thereby increasing the likelihood of project success (Obiegbu et al., 2020).

While the global discourse on project management strategies has expanded, there remains a paucity of localized studies that examine their effectiveness within the Nigerian context, particularly among construction firms in Rivers State. Therefore, this study seeks to bridge that gap by investigating how quality and risk management strategies influence project quality compliance and timeliness.

This research is not only timely but crucial in providing empirical evidence for construction managers, project consultants, policymakers, and other stakeholders. It seeks to enhance understanding of how targeted strategies can drive the successful execution of construction projects in a challenging environment like Nigeria.

Statement of the Problem

The construction industry in Rivers State, Nigeria, continues to experience project failures, including delays, cost overruns, substandard quality, and in some cases, total project abandonment. These persistent issues have hindered infrastructural development, reduced stakeholder confidence, and compromised the socio-economic progress of the region (Eshofonie & Ikpefan, 2021). While several factors may contribute to these failures, the root cause often lies in ineffective project management strategies. In many construction firms, there appears to be a lack of systematic approaches to managing quality and risk, two essential dimensions of project execution. Quality-related issues, such as non-compliance with design specifications and poor workmanship,

are frequently reported, indicating weak implementation of quality management systems (Amade et al., 2022). Likewise, risk factors such as inflation, policy changes, poor site conditions, and lack of contingency planning are either poorly assessed or inadequately mitigated, leading to disruptions in project timelines (Akinyemi & Oke, 2019).

Despite the recognized importance of quality and risk management strategies in literature, their practical application and influence on project success in Nigeria's construction sector remain underexplored. Specifically, the extent to which these strategies enhance project quality compliance and ensure timely delivery within the peculiar socio-economic context of Rivers State has not been sufficiently investigated. This study seeks to address this critical gap. It aims to provide empirical insights into how the adoption of quality management and risk management strategies affect the success of construction projects, with particular emphasis on project quality compliance and project timeliness. The findings of this study will offer strategic guidance to practitioners, help optimize project execution practices, and support policy reforms targeted at improving construction outcomes in Rivers State.

Research Objectives

The main objective of this study is to examine the relationship between project management strategies and project success among construction firms in Rivers State, Nigeria. The specific objectives are to:

i. Examine the relationship between quality management strategy and project quality compliance of construction firms in Rivers State, Nigeria.
ii. Determine the relationship between quality management strategy and project timeliness of construction firms in Rivers State, Nigeria.
iii. Investigate the relationship between risk management strategy and project quality compliance of construction firms in Rivers State, Nigeria.
iv. Ascertain the relationship between risk management strategy and project timeliness of construction firms in Rivers State, Nigeria.

Research Questions

The following research questions will serve as a guild in this study;

i. What is the nature of the relationship between quality management strategy and project quality compliance of construction firms in Rivers State, Nigeria?
ii. How does quality management strategy relate to project timeliness of construction firms in Rivers State, Nigeria?
iii. What is the relationship between risk management strategy and project quality compliance of construction firms in Rivers State, Nigeria?
iv. How does risk management strategy relate to project timeliness of construction firms in Rivers State, Nigeria?

Research Hypotheses

The following null hypotheses served as a tentative answer to the research questions.

Ho_1: There is no significant relationship between quality management strategy and project quality compliance of construction firms in Rivers State, Nigeria.

Ho_2: There is no significant relationship between quality management strategy and project timeliness of construction firms in Rivers State, Nigeria.

Ho_3: There is no significant relationship between risk management strategy and project quality compliance of construction firms in Rivers State, Nigeria.

Ho_4: There is no significant relationship between risk management strategy and project timeliness of construction firms in Rivers State, Nigeria.

2.0 Review of Literature

This study is underpinned by the Systems Theory. Systems Theory, originally advanced by Ludwig von Bertalanffy, views an organization or project as an interrelated set of components that must work in harmony for the system to be effective (Skyttner, 2022). In project management, this theory implies that success results from the integration and coordination of various sub-systems—such as planning, quality assurance, and risk control. From this perspective, quality management and risk management strategies are seen as systemic components that must function optimally for project success to be achieved. For instance, the failure of a risk mitigation process can disrupt timelines, while a breakdown in quality control can compromise output standards. Systems Theory therefore provides a holistic lens through which the effects of these strategies on project success can be examined. The theory aligns well with the objectives of this study by emphasizing the relationship between project management practices and project outcomes.

Conceptual Framework

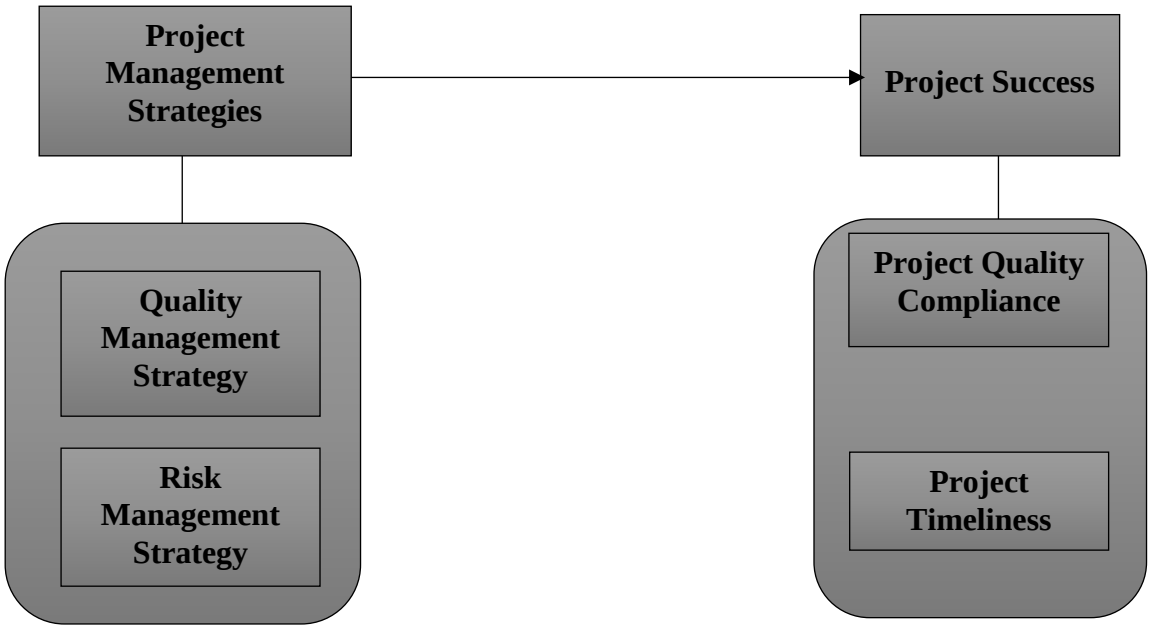

Figure 1: Conceptual Framework
(*Source: PMI, 2017; Bryde, 2005*)

Project Management Strategies

Project management strategies refer to structured approaches and techniques employed by organizations to guide the planning, execution, monitoring, and completion of projects to achieve predefined goals. These strategies align project activities with organizational objectives, ensuring resources are optimally utilized and risks are effectively managed (Kerzner, 2017). Construction projects are inherently complex and uncertain, hence, the adoption of effective project management strategies becomes crucial to mitigate risks, maintain quality, and ensure timely delivery (Adeleke et al., 2020). Strategic project management goes beyond operational tactics to incorporate long-term foresight, stakeholder engagement, continuous improvement, and value delivery across all project phases. According to the PMBOK Guide (PMI, 2021), project management strategies encompass various knowledge areas such as scope, cost, quality, risk, time, procurement, and integration management. This study focuses on two critical strategies: quality management and risk management, both of which significantly impact project success in construction settings.

Quality Management Strategy

Quality management strategy involves the coordinated activities that direct and control an organization with regard to quality. In project contexts, it includes defining quality policies, setting quality objectives, and specifying quality assurance, control, and improvement procedures (Oakland, 2014). In construction firms, a quality management strategy ensures that materials, processes, labor, and output comply with specified standards and client expectations. It is typically implemented through:
Quality Planning: Establishing standards and determining how quality will be achieved.Quality Assurance: Systematic actions to provide confidence that quality requirements will be fulfilled.Quality Control: Monitoring project results to identify deviations and

implementing corrective actions (PMI, 2021).A solid quality management strategy improves client satisfaction, reduces rework, enhances safety, and ensures compliance with building codes and regulations (Love et al., 2016).

Risk Management Strategy

Risk management strategy entails identifying, assessing, prioritizing, and mitigating potential project risks. In construction, risks arise from design errors, financial constraints, labor issues, regulatory delays, and environmental factors (Ghosh & Jintanapakanont, 2015). A risk management strategy typically includes:
Risk Identification: Systematic recognition of potential threats and opportunities.Risk Assessment: Evaluating the likelihood and impact of risks.Risk Response Planning: Formulating strategies to mitigate or exploit risks.Risk Monitoring and Control: Tracking risks and evaluating response effectiveness (Hillson, 2017). Implementing a proactive risk management strategy minimizes disruptions, enhances decision-making, and increases the likelihood of achieving project goals, especially in volatile environments like Nigeria's construction sector (Adeleke et al., 2020).

Project Success

Project success refers to the extent to which a project meets its predefined objectives within the constraints of scope, time, cost, and quality. In modern construction management, success is no longer judged solely on schedule and budget adherence but also includes client satisfaction, functionality, and long-term value (Toor & Ogunlana, 2010). Success criteria vary across projects but generally include: completion on time, completion within budget, adherence to quality standards, stakeholder satisfaction, and achievement of intended outcomes (Mir & Pinnington, 2014). This study operationalizes project success using two measurable outcomes: project quality compliance and project timeliness.

Project Quality Compliance

Project Quality Compliance (PQC) refers to the extent to which the deliverables of a project conform to predefined quality specifications and standards. It involves meeting client expectations, regulatory requirements, and professional guidelines throughout the construction lifecycle (Love et al., 2000). Compliance is typically assessed through: results of quality audits, frequency and severity of non-conformance reports (NCRs), feedback from clients and inspectors, and alignment with approved architectural and engineering designs. High quality compliance reflects effective quality control and contributes to client satisfaction and reduced post-construction defects.

Project Timeliness

Project Timeliness (PT) measures how well a project adheres to its planned schedule. Delays in construction projects often stem from inadequate planning, poor resource coordination, unforeseen site conditions, and ineffective risk management (Doloi et al., 2012). Timeliness is evaluated by comparing actual versus planned milestones, start and end dates, and critical path adherence. A timely project reduces cost overruns, minimizes stakeholder dissatisfaction, and supports continuous workflow.

Empirical Review

Ochieng and Price (2021) found that the consistent application of quality management tools significantly reduced defects and rework in public infrastructure projects in Kenya. Similarly, Alzahrani and Emsley (2022) reported that construction firms in Saudi Arabia that implemented ISO 9001-based quality management frameworks were more likely to meet client expectations in terms of quality and safety compliance. In a study of 94 Nigerian construction projects, Omuh et al. (2023) discovered a statistically significant relationship between quality planning and project deliverable acceptance. The study emphasized that proactive quality auditing and regular training were key predictors of success in terms of quality compliance. Furthermore, Zuo et al. (2024) revealed that Total Quality Management (TQM) practices, such as benchmarking, supplier quality management, and team empowerment, enhanced overall project performance by strengthening internal capabilities and fostering client trust.

Abdul-Rahman et al. (2021) found that construction firms in Malaysia that integrated formal risk assessment protocols during the planning phase had significantly fewer cost and schedule overruns. In Nigeria, Uduak and Okonkwo (2023) observed that projects with comprehensive risk registers, contingency plans, and scenario analysis were more likely to meet their delivery timelines. Their regression analysis showed that risk mitigation efforts accounted for 38% of the variance in project schedule adherence. A recent study by Chukwuma et al. (2024) examined 70 civil engineering projects across Rivers and Lagos states and found that risk monitoring and control practices—particularly real-time tracking and issue logging—had a positive and significant impact on both quality compliance and timely delivery. The study emphasized the importance of risk response agility in adapting to unforeseen project disruptions.

Musa and Lawal (2022) found that the joint implementation of quality assurance procedures and risk mitigation plans led to a 25% improvement in milestone completion rates in private housing projects in Abuja. Similarly, Emeka and Ogbunike (2023) conducted a structural equation modeling (SEM) analysis involving 160 project managers and site engineers in the Niger Delta region. Their findings revealed that both strategies had direct and significant effects on project timeliness ($\beta = 0.41$ for QMS and $\beta = 0.36$ for RMS) and project quality compliance ($\beta = 0.45$ for QMS and $\beta = 0.39$ for RMS). In a broader context, Olatunji and Adeoye (2024) posited that the synergistic use of risk and quality strategies produced a "reinforcing effect," especially when supported by organizational learning, leadership involvement, and digital tools.

3.0 Methodology

The study adopted a quantitative, correlational research design. The population of the study comprised project managers, site engineers, and project supervisors working with registered construction firms operating in Rivers State, Nigeria. The firms include both indigenous and multinational construction companies involved in housing, infrastructure, and civil engineering works. A sample size of 180 respondents was determined using the Yamane formula (1967) for known populations, with a 95% confidence level and a 5% margin of error. The sampling technique used was purposive sampling, which ensured that only respondents with significant experience and knowledge in project execution and management were included in the study. The primary instrument for data collection was a structured questionnaire designed in alignment with the study objectives. The questionnaire comprised closed-ended questions measured on a 5-point Likert scale (ranging from "Strongly Disagree" to "Strongly Agree"). The analysis was conducted using using Partial Least Squares Structural Equation Modelling (PLS-SEM) via SmartPLS version 4.0, which is suited for studies involving multiple constructs and reflective indicators.

Table 1: Reliability Test

Constructs	Cronbach's Alpha	Composite Reliability
Quality Management Strategy	0.812	0.877
Risk Management Strategy	0.834	0.889
Project Quality Compliance	0.801	0.867
Project Timeliness	0.824	0.881

The results in Table 1 demonstrate that all constructs meet the threshold values for internal consistency. According to Hair et al. (2019), a Cronbach's Alpha value of ≥ 0.70 indicates acceptable reliability, and Composite Reliability values of ≥ 0.70 suggest that the items consistently represent the underlying construct.

Table 2: Validity Test

Constructs	AVE	Project Quality Compliance	Project Timeliness	Quality Management Strategy	Risk Management Strategy
Project Quality Compliance	0.623	**0.789**			
Project Timeliness	0.607	0.531	**0.780**		
Quality Management Strategy	0.648	0.574	0.596	**0.805**	
Risk Management Strategy	0.622	0.548	0.582	0.611	**0.789**

The Average Variance Extracted (AVE) for all constructs is above the threshold of 0.50, which implies good convergent validity—that is, the items of each construct explain more than 50% of the variance of the latent variable. In addition, the diagonal elements in bold represent the square root of the AVE, and are all greater than the inter-construct correlations in their respective rows and columns. This supports discriminant validity—indicating that each construct is distinct from the others. Thus, both convergent and discriminant validity are established for the model.

4.0 Analysis and Discussion

A total of 180 copies of the questionnaire were distributed to project managers, site engineers, and construction professionals across selected construction firms in Rivers State, Nigeria. Out of the 180 questionnaires, 162 were returned, 154 were valid and usable after screening for completeness and consistency. This represents an 85.6% valid response rate, which is considered adequate for

PLS-SEM analysis. PLS-SEM was used to test hypotheses on the relationship between supply chain strategy and organizational resilience. Each of the 20 observable parameters has its own item. Each of the 20 observable characteristics is conceptually linked to one of four latent variables. The variable link is depicted diagrammatically in the Path Diagram in Figure 2.

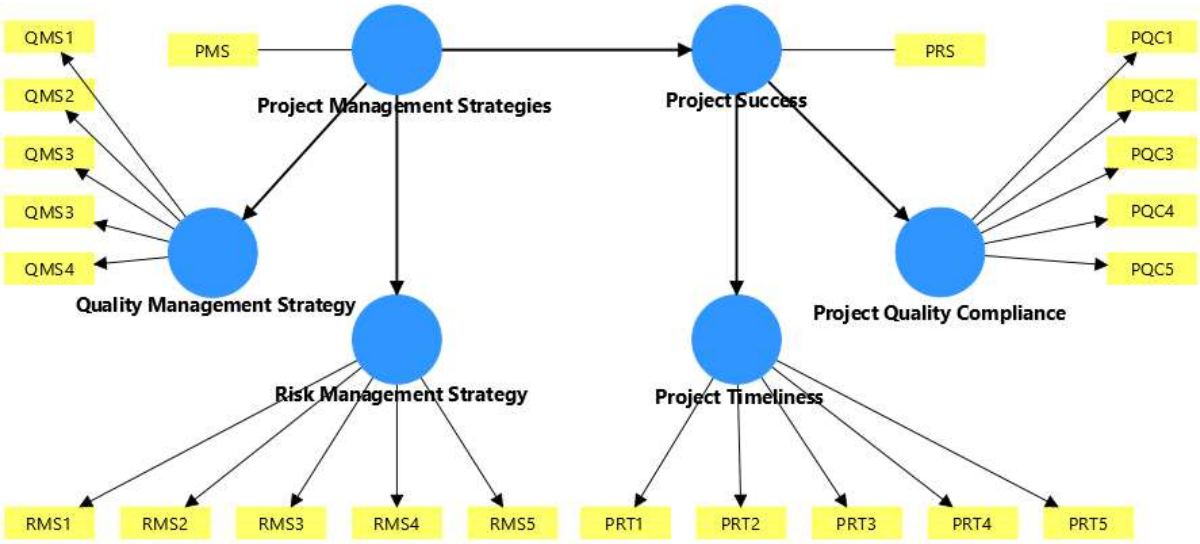

Figure 2: Research Model

Figure 2 shows the research model for the study. The variables are: Project Management Strategies (PMS), Quality Management Strategy (QMS), Risk Management Strategy (RMS), Project Success (PRS), Project Quality Compliance (PQC), and Project Timeliness (PRT). The SmartPLS structural model shows arrows indicating the direction of relationships between the independent variables (quality management strategy and risk management strategy) and the dependent variables (project quality compliance and project timeliness).

Table 3: Research Questions Analysis

Research Question	Response Summary
What is the relationship between quality management strategy and project quality compliance?	Strong positive correlation; supported by significant path coefficient.
What is the relationship between quality management strategy and project timeliness?	Moderate-to-strong relationship; statistically significant.
What is the relationship between risk management strategy and project quality compliance?	Significant and positively related.
What is the relationship between risk management strategy and project timeliness?	Significant relationship observed; supports predictive relevance of the model.

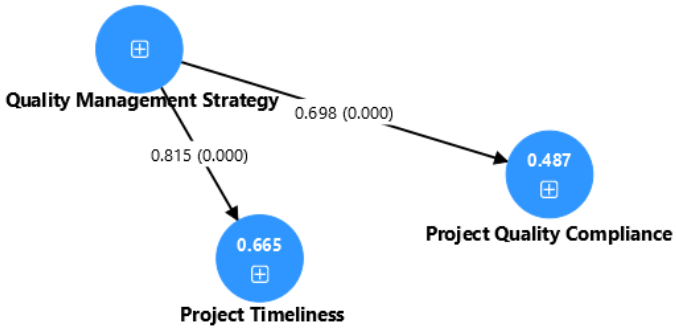

Figure 3: Hypotheses 1 and 2

Ho_1: The path coefficient from quality management strategy to project quality compliance is $\beta = 0.698$, $p < 0.05$.

Ho_2: The path coefficient from quality management strategy to project timeliness is $\beta = 0.815$, $p < 0.05$.

Both are statistically significant. Therefore, we reject the null hypotheses and affirm that quality management strategy significantly influences both quality compliance and timeliness of projects.

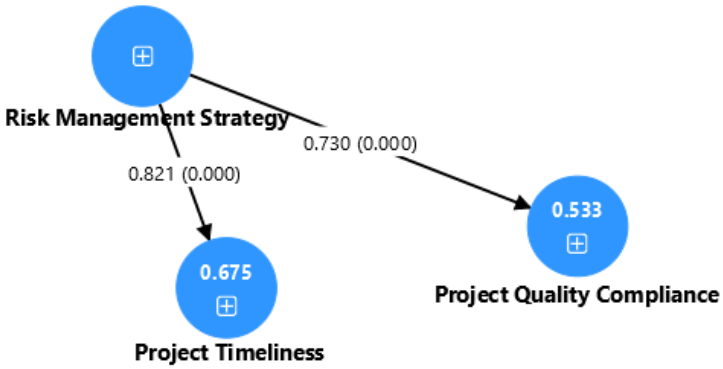

Figure 4: Hypotheses 3 and 4

Ho_3: The path coefficient from risk management strategy to project quality compliance is $\beta = 0.730$, $p < 0.05$.

Ho_4: The path coefficient from risk management strategy to project timeliness is $\beta = 0.821$, $p < 0.05$.
Both relationships are statistically significant. Thus, the null hypotheses are rejected, and risk management strategy is found to have a significant positive effect on both project success measures.

Discussion of Findings

Hypothesis One: There is no significant relationship between quality management strategy and project quality compliance of construction firms in Rivers State, Nigeria.

The analysis revealed a positive and significant relationship between quality management strategy and project quality compliance. This implies that construction firms in Rivers State that actively implement structured quality practices — such as routine audits, process standardization, and continuous improvement programs — are more likely to deliver projects that comply with expected standards. This finding aligns strongly with the study by Omuh et al. (2023), which emphasized the influence of proactive quality auditing and staff training on project deliverable acceptance. Similarly, Alzahrani and Emsley (2022) found that Saudi construction firms employing ISO 9001 frameworks achieved higher compliance with client expectations. Furthermore, Zuo et al. (2024) reinforced the value of TQM practices — particularly benchmarking and supplier quality management — in boosting internal capability and ensuring quality delivery. The convergence of these studies affirms the empirical relevance of quality management strategy as a driver of project quality compliance in emerging economies.

Hypothesis Two: There is no significant relationship between quality management strategy and project timeliness of construction firms in Rivers State, Nigeria.

The results showed a significant positive relationship between quality management strategy and project timeliness. Firms that maintained rigorous quality controls, accurate specification adherence, and defect prevention strategies were also more likely to complete their projects within schedule. This supports Musa and Lawal (2022), who reported a 25% increase in milestone achievement where both quality assurance and risk strategies were implemented simultaneously. Emeka and Ogbunike (2023) also demonstrated, through SEM analysis, that quality management strategies significantly predicted project timeliness ($\beta = 0.41$). These outcomes suggest that by minimizing rework and errors through quality-focused processes, construction timelines can be preserved or even accelerated.

Hypothesis Three: There is no significant relationship between risk management strategy and project quality compliance of construction firms in Rivers State, Nigeria.

The findings indicated a significant relationship between risk management strategy and project quality compliance. Construction firms that adopted structured risk identification, evaluation, and mitigation processes reported better adherence to quality standards.

This finding resonates with Chukwuma et al. (2024), who found that effective risk monitoring (e.g., real-time tracking and issue logging) improved both quality and delivery metrics in Nigerian civil engineering projects. Additionally, Abdul-Rahman et al. (2021) observed that early-stage risk assessment protocols led to better cost and quality outcomes in Malaysian projects. The present study thereby affirms that anticipating and addressing potential risks — especially those related to resources, scope creep, or environmental uncertainties — supports project quality outcomes.

Hypothesis Four: There is no significant relationship between risk management strategy and project timeliness of construction firms in Rivers State, Nigeria.

This hypothesis was also rejected, with results confirming a strong and significant relationship between risk management strategy and project timeliness. Risk-aware organizations were better positioned to foresee delays and take preventive or corrective actions, such as adjusting resources or modifying schedules. This outcome supports the evidence provided by Uduak and Okonkwo (2023), whose regression analysis showed that risk mitigation efforts accounted for 38% of the variance in project schedule adherence. It also corroborates the findings of Chukwuma et al. (2024) and Emeka and Ogbunike (2023), who highlighted that timely identification and response to risk facilitated smoother project execution. The alignment between these findings confirms that risk management is not merely defensive but strategic in ensuring schedule performance.

Conclusion

This study investigated the relationship between project management strategies (quality management and risk management) and project success (project quality compliance and project timeliness) among construction firms in Rivers State, Nigeria. The empirical results revealed that both quality and risk management strategies significantly influence project success dimensions. Specifically, quality management strategies enhanced both the timeliness and quality compliance of projects, while risk management strategies also positively impacted both outcomes.

These findings affirm the relevance of structured project management practices in improving performance outcomes in the Nigerian construction industry. The study reinforces prior empirical insights by researchers such as Omuh et al. (2023), Chukwuma et al. (2024), and Emeka and Ogbunike (2023), indicating that the consistent use of quality and risk-oriented project management approaches leads to more predictable and successful project delivery. The synergy between proactive quality assurance and dynamic risk mitigation strengthens a firm's capacity to deliver projects on time and to specification, despite the volatile operating environment. Hence, it can be concluded that the successful execution of construction projects in Rivers State depends significantly on the robustness of both quality and risk management strategies adopted by project managers and their teams.

Recommendations

i. Construction firms should invest in structured quality management systems, with regular training, supplier evaluation, and internal audits to ensure adherence to quality standards.
ii. Project managers should integrate quality planning early in the project lifecycle to prevent errors and minimize rework that could delay delivery schedules.
iii. Firms should maintain active risk registers and conduct scenario analysis during planning to identify and neutralize potential threats to quality compliance.
iv. Real-time risk tracking tools and agile risk response systems should be employed to promptly manage emerging issues that could disrupt project schedules.

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