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RESOURCE OPTIMIZATION, RESOURCE PRIORITIZATION, AND PROJECT PERFORMANCE AMONG CONSTRUCTION FIRMS IN RIVERS STATE, NIGERIA

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ABSTRACT

This study explores the relationship between resource optimization, resource prioritization, and project performance among construction firms in Rivers State, Nigeria. The primary objectives were to examine how effective resource allocation strategies influence project outcomes in terms of cost efficiency, quality, and timely delivery. Adopting a cross-sectional research design underpinned by the positivist paradigm, the study utilized a census approach involving 222 management staff from 10 construction firms. Data were collected using a structured questionnaire with 15 items covering demographic details, resource optimization, resource prioritization, and project performance. Responses were analyzed using the Kendall rank correlation coefficient, allowing for an objective and statistical exploration of the relationships between the variables. The findings reveal a strong positive correlation ($\tau = 0.678$, $p < 0.05$) between resource optimization and project performance, indicating that efficient resource management significantly enhances project outcomes. Additionally, a moderate correlation ($\tau = 0.591$, $p < 0.05$) was found between resource prioritization and project performance, suggesting that allocating resources to critical tasks improves project success, though to a lesser extent. These results align with the Resource-Based View Theory, emphasizing the importance of strategic resource management in a resource-constrained environment. The study concludes that construction firms in Rivers State can improve project performance by enhancing resource optimization and prioritization. Recommendations include adopting digital tools like Primavera or Microsoft Project to optimize resource allocation and implementing regular training workshops for project managers. Firms should also establish frameworks such as ABC or Pareto analysis for effective resource prioritization and regularly review projects to adjust resource allocation as needed. These measures will enhance efficiency, minimize delays, and improve overall project performance in Nigeria's construction sector.

KEYWORDS

Resource Optimization, Resource Prioritization, Project Performance, Construction Firms

Introduction

The construction sector is a cornerstone of Nigeria's economy, significantly contributing to the nation's Gross Domestic Product (GDP), generating substantial employment opportunities, and facilitating foreign exchange earnings through infrastructure development and foreign investments (Osamudiamen et al., 2022). The construction industry plays a pivotal role in economic growth but faces persistent challenges such as cost overruns, project delays, and quality deficiencies, which undermine project performance (Buba, 2023; Mustapha et al., 2023). These issues are exacerbated by resource constraints, regulatory changes, political instability, and supply chain disruptions, which complicate effective project execution in the region (Osamudiamen et al., 2022). Despite these challenges, the construction sector remains vital for socioeconomic development, necessitating strategies to enhance project outcomes and maintain competitiveness in a dynamic market environment.

Project performance is critical for construction firms to achieve client satisfaction and organizational success (Mustapha et al., 2023). Effective project performance ensures projects are delivered within budget, on schedule, and to the required quality standards, directly impacting stakeholder trust and firm reputation (Olasunkanmi et al., 2024). Metrics such as the Cost Performance Index (CPI), Schedule Performance Index (SPI), and quality compliance indicators are essential tools for monitoring and evaluating performance, enabling managers to address deviations promptly (Mustapha et al., 2023). A collaborative organizational culture further enhances performance by fostering efficient resource utilization and informed decision-making (Olasunkanmi et al., 2024). However, persistent performance issues, including delays and cost overruns, highlight the need for strategic interventions to improve project outcomes in Nigeria's construction sector (Buba, 2023).

Resource optimization focuses on maximizing the efficiency of resource use, employing techniques like resource leveling and digital tools to minimize waste and ensure timely, cost-effective project delivery (Kibagendi & Sang, 2024; Kiungo & Otieno, 2023). Resource prioritization, on the other hand, involves allocating resources to high-impact tasks using methods like ABC or Pareto analysis, ensuring critical activities are adequately resourced to meet project goals (Agyei et al., 2023; Mustapha et al., 2023). Grounded in the Resource-Based View (RBV) Theory, which emphasizes the strategic deployment of valuable, rare, inimitable, and non-substitutable resources to achieve competitive advantage (Barney, 1991; Wernerfelt, 1984), these strategies enable firms to leverage resources like skilled labor and technology to improve project efficiency and outcomes (Agyei et al., 2023). By optimizing and prioritizing resources, construction firms can address resource constraints and project complexities, aligning with RBV's focus on resource heterogeneity as a driver of performance (Kibagendi & Sang, 2024).

Despite the recognized importance of project performance, previous studies have largely focused on factors like team effectiveness or financial management, with limited attention to the specific roles of resource optimization and prioritization in the construction sector (Hassan et al., 2023; Mustapha et al., 2023). For instance, Hassan et al. (2023) explored team effectiveness in Bauchi State, focusing solely on cost performance, while Kibagendi and Sang (2024) examined resource allocation in Kenyan housing projects but did not explicitly address prioritization or broader performance metrics like quality. Agyei et al. (2023) investigated resource allocation for innovation in Ghana but lacked primary data and a focus on construction-specific performance. Mustapha et al. (2023) analyzed project success in Ghana without employing a theoretical framework like RBV or directly exploring resource optimization and prioritization. These gaps indicate a lack of comprehensive research on how these

strategies influence cost, time, and quality outcomes in the construction industry of developing areas like Rivers State, Nigeria.

To this end, this study investigated the nature of the impact of resource optimization and resource prioritization on project performance of construction companies in Rivers State.

Hypotheses

The following hypotheses guided the study:

H_{01}: Resource optimization does not have any significant relationship with project performance.

H_{02}: There is no significant relationship between Resource prioritization and organizational performance.

Literature Review

Conceptual Review

Resource Optimization: Resource optimization is a pivotal strategy in construction project management, focusing on maximizing the efficiency and effectiveness of resource utilization to enhance project outcomes while minimizing waste and costs. In the construction industry, where resource constraints are common, optimization techniques such as resource leveling and smoothing are critical for balancing resource demand and availability, ensuring that projects are completed within budget and on time (Kibagendi & Sang, 2024). These strategies help reduce idle time and resource overuse, addressing challenges like cost overruns and delays that are prevalent in the Nigerian construction sector (Buba, 2023). By employing digital tools and real-time monitoring, construction firms can further enhance resource optimization, allowing for dynamic adjustments to resource allocation in response to project changes (Kiungo & Otieno, 2023). However, accurate resource estimation remains a challenge, requiring continuous coordination and communication among stakeholders to align resources with project needs (Ahsun & Elly, 2024). Effective resource optimization not only improves project efficiency but also contributes to sustainability by reducing environmental impact and aligning with organizational goals, making it essential for construction firms striving to remain competitive in a resource-constrained environment.

Resource Prioritization: Resource prioritization is a strategic approach in project management that involves allocating resources to tasks based on their criticality to project success, ensuring that high-priority activities receive adequate attention and resources. This strategy is vital due to the limited availability of resources and the complexity of projects, which often face competing demands (Osamudiamen et al., 2022). Techniques such as ABC analysis and Pareto analysis are employed to identify and prioritize tasks that have the most significant impact on project outcomes, enabling project managers to focus resources on time-sensitive or high-impact activities (Agyei et al., 2023). This prioritization is particularly crucial in managing resource conflicts and aligning resource allocation with organizational objectives, thereby enhancing project efficiency and stakeholder satisfaction (Mustapha et al., 2023). However, challenges such as inaccurate prioritization and the need for continuous monitoring to adapt to changing project conditions can complicate implementation (Kibagendi & Sang, 2024).

Project Performance: Project performance is a multidimensional construct that measures the success of a project in meeting its objectives, including cost, time, and quality targets, and is particularly critical in the construction industry, where external and internal challenges significantly impact outcomes. Effective resource allocation strategies, such as optimization and prioritization, are essential for achieving strong project performance by ensuring resources are used efficiently to meet project goals (Buba, 2023). Organizational culture also plays a significant role, as a collaborative and innovative culture can enhance resource utilization and decision-making, leading to better project outcomes (Olasunkanmi et al., 2024). Metrics such as the Cost Performance Index (CPI), Schedule Performance Index (SPI), and quality compliance indicators are used to monitor and evaluate performance, helping project managers address deviations promptly (Mustapha et al., 2023). However, the Nigerian construction industry faces challenges like regulatory changes, political instability, and supply chain disruptions, which can hinder performance (Osamudiamen et al., 2022).

Theoretical Framework

Resource-Based View Theory: The Resource-Based View (RBV) Theory, first articulated by Edith Penrose in 1959 and later formalized by Jay Barney in 1991, posits that a firm's competitive advantage stems from its unique bundle of resources that are valuable, rare, inimitable, and non-substitutable (VRIN). The core tenet of RBV is that organizational performance is driven by the strategic deployment of these resources, which include tangible assets like equipment and intangible assets like organizational culture or expertise (Barney, 1991). By leveraging these resources effectively, firms can achieve sustained competitive advantage, as competitors struggle to replicate or substitute them. RBV emphasizes resource heterogeneity, suggesting that differences in resource endowments explain variations in firm performance (Wernerfelt, 1984). However, critics argue that RBV focuses too heavily on internal resources, often neglecting external factors like market dynamics or competitive forces, as highlighted by Porter (1985). Additionally, the complexity of identifying and measuring VRIN resources can make practical application challenging, limiting its prescriptive power (Pfeffer, 1981).

RBV provides a robust framework for understanding how resource optimization and prioritization influence project performance. The theory underscores the importance of strategically managing resources such as skilled labor, advanced technology, and financial capital to enhance project outcomes like cost efficiency, timely delivery, and quality (Agyei et al., 2023). For instance, firms that optimize their resource use through techniques like resource leveling or digital tools can minimize waste and improve efficiency, aligning with RBV's focus on leveraging unique resources for competitive advantage (Kibagendi & Sang, 2024). Similarly, prioritizing resources for critical tasks ensures that high-impact project activities are adequately resourced, reflecting RBV's emphasis on strategic resource allocation (Mustapha et al., 2023).

Empirical Review

Table 1: Webometrics of Gaps in Literature

S/N	Author(s)/ Year	Country	Topic/ Objectives	Methodology	Findings	Conclusion	Gaps	Comparison with Current Study
1	Hassan et al. (2023)	Nigeria	Examine the influence of construction project team effectiveness on cost performance in higher institutions' building projects in Bauchi State, Nigeria.	Quantitative survey research design; 150 questionnaires administered to project team members in four higher institutions, with 134 valid responses (89% response rate); data analyzed using statistical methods.	56.5% of changes in cost performance explained by variations in team effectiveness.	Team effectiveness is a critical determinant of cost performance, emphasizing the need for collaborative and well-coordinated teams.	Focuses solely on team effectiveness and cost performance, not broader resource allocation strategies or other performance metrics (time, quality).	The current study examines a broader scope, including resource optimization and prioritization, and multiple performance metrics (cost, time, quality) across 10 firms in Rivers State, using Kendall rank correlation coefficient and RBV Theory, unlike the focus on team effectiveness in Bauchi State.
2	Agyei et al. (2023)	Ghana	Investigate resource allocation strategies for maintaining competitiveness and achieving innovation success, focusing on organizational outcomes relevant to construction.	Literature review and bibliographic analysis using systematic review procedure; analyzed empirical and theoretical studies on resource allocation, innovation, and competitiveness, guided by RBV Theory.	Companies allocating more resources to R&D are more likely to launch innovative products/services, enhancing competitiveness and financial performance.	Effective resource allocation strategies are key to maintaining competitiveness and innovation success.	Focuses on innovation and competitiveness, not directly on construction project performance metrics (cost, time, quality); lacks primary data collection.	The current study uses primary data from 222 management staff in Rivers State, focuses on construction-specific performance metrics, and employs a cross-sectional design with Kendall rank correlation, while sharing the RBV Theory framework with Agyei et al.
3	Kibagendi & Sang (2024)	Kenya	Investigate the impact of resource allocation on the performance of housing construction projects in Kiambu County, Kenya.	Descriptive research approach; examined 120 completed housing complexes (2019–2022) with 92% professional respondents (architects, engineers); stratified random sampling; data analyzed using descriptive and inferential statistics, guided by RBV Theory.	Resource allocation significantly influences housing project performance, particularly through effective human resource strategies.	Strategic resource allocation is critical for project success; recommends efficient human resource strategies.	Limited to housing projects in Kiambu County; does not explicitly address resource prioritization or broader performance metrics like quality.	The current study covers a wider range of construction projects in Rivers State, includes resource prioritization, and analyzes cost, time, and quality using Kendall rank correlation, but shares the RBV Theory and focus on resource allocation.
4	Mustapha et al. (2023)	Ghana	Examine construction project success in relation to time, cost, quality, and safety in the Ashanti Region, Ghana.	Structured questionnaire administered to construction professionals (architects, contractors, engineers, quantity surveyors); data analyzed using descriptive methods.	Delays in payments, layoffs, and work suspensions negatively affect time; poor cash flow and high equipment costs impact costs; quality issues linked to poor coordination and absenteeism.	Financial support and effective contract management are essential for project success.	Does not directly explore resource allocation or prioritization strategies; focuses on broader success factors without a theoretical framework like RBV.	The current study explicitly examines resource optimization and prioritization, uses RBV Theory, and employs a cross-sectional design with Kendall rank correlation for 222 management staff in Rivers State, unlike Mustapha et al.'s broader focus without a specific theoretical lens.

Methodology:

The study adopted a cross-sectional research design, underpinned by the positivist philosophical paradigm, to investigate the relationships between resource allocation strategies and project outcomes. A census approach was employed, involving all 222 management staff from 10 selected construction companies, ensuring comprehensive data collection without sampling bias (Baridam, 2001; Saunders et al., 2012). Data were gathered using a structured questionnaire with 15 items, divided into sections addressing resource optimization, resource prioritization, and project performance. The questionnaire utilized a four-point Likert-like scale, adapted from Pratama et al. (2023) for resource allocation measures and Ahmed (2023) for project performance metrics, ensuring relevance and specificity to the construction context (Creswell & Creswell, 2018).

Face and content validity were ensured through expert consultations and literature reviews, while reliability was confirmed via a pilot study with 25 management staff, using Cronbach's Alpha to verify internal consistency (Bolarinwa, 2015; Taherdoost, 2016). The inclusion of diverse companies enhanced the generalizability of findings within Rivers State's construction sector, addressing variations in organizational structures and project types (Gray, 2018; (Kothari & Garg, 2014). Responses were analyzed using the Kendall rank correlation coefficient to test hypotheses, aligning

with the positivist emphasis on objective, statistical analysis to uncover patterns and relationships (Bryman, 2016; Zikmund et al., 2013).

Results and Discussion

Results and Analyses

Table 1: Demographic Analyses

		Frequency	Percent	Valid Percent	Cumulative Percent
Age Group Distribution					
Valid	Less than 35 years	48	21.6	21.6	21.6
	35 - 45 years	69	31.1	31.1	52.7
	46 - 55 years	75	33.8	33.8	86.5
	56 years and above	30	13.5	13.5	100.0
	Total	**222**	**100.0**	**100.0**	
Educational Level Distribution					
Valid	B.Sc. or Equivalent	56	25.2	25.2	25.2
	Masters or Equivalent	135	60.8	60.8	86.0
	PhD or Equivalent	31	14.0	14.0	100.0
	Total	**222**	**100.0**	**100.0**	
Length of Time in Construction Industry Distribution					
Valid	1 to 5 Years	73	32.9	32.9	32.9
	6 to 10 Years	67	30.2	30.2	63.1
	10 Years and Above	82	36.9	36.9	100.0
	Total	**222**	**100.0**	**100.0**	

Table 1 the demographic profile of the 222 respondents from construction firms in Rivers State, Nigeria, reveals a workforce that is relatively mature, highly educated, and experienced, which likely influences their capacity to engage with resource optimization and prioritization strategies to enhance project performance. The age distribution shows that 64.9% of respondents are aged 35–55 years (31.1% aged 35–45 and 33.8% aged 46–55), with only 21.6% younger than 35 and 13.5% older than 56, indicating a predominantly middle-aged workforce that balances experience with adaptability. The educational level distribution is notably high, with 60.8% holding master's degrees or equivalent and 14.0% possessing PhDs, suggesting a workforce capable of sophisticated decision-making and strategic resource management. Additionally, the length of time in the construction industry shows a balanced mix, with 36.9% having over 10 years of experience, 30.2% with 6–10 years, and 32.9% with 1–5 years, reflecting a blend of seasoned professionals and newer entrants who bring diverse perspectives to project execution.

Univariate Analyses

Table 2: Descriptive Statistics on Resource Optimization

Item	N	Min	Maxi	Mean	Std. Deviation	Skewness (Statistic)	Skewness (Std. Error)	Kurtosis (Statistic)	Kurtosis (Std. Error)
Our company strives to maximize resource utilization to achieve optimal project outcomes.	222	1	5	2.82	1.106	.090	.163	-.747	.325
We regularly evaluate and refine resource usage to eliminate inefficiencies in projects.	222	1	5	2.97	1.133	-.172	.163	-.840	.325
Resource optimization strategies in our organization balance cost, time, and quality requirements.	222	1	5	2.84	1.093	.096	.163	-.640	.325
The company invests in training to improve resource management and optimization practices.	222	1	5	3.48	1.036	-.641	.163	.046	.325
Our resource optimization efforts ensure that resources are not underutilized or overburdened.	222	1	5	3.28	1.026	-.633	.163	-.243	.325

The descriptive statistics for resource optimization (Table 2) indicate moderate agreement among respondents. The highest mean score was for "The company invests in training to improve resource management and optimization practices" (M = 3.48, SD = 1.036), suggesting that firms prioritize capacity building. The negative skewness (-0.641) indicates a tendency toward agreement. Other items, such as "Our company strives to maximize resource utilization" (M = 2.82, SD = 1.106) and "Resource optimization strategies balance cost, time, and quality" (M = 2.84, SD = 1.093), show lower agreement, with standard deviations above 1.0 indicating varied perceptions. Negative kurtosis values suggest flatter response distributions, reflecting diverse opinions on resource optimization effectiveness. These findings suggest that while training is a strength, broader resource optimization efforts may require further refinement to consistently achieve desired project outcomes.

Table 3: Descriptive Statistics on Resource Prioritization

Item	N	Min	Max	Mean	Std. Deviation	Skewness (Statistic)	Skewness (Std. Error)	Kurtosis (Statistic)	Kurtosis (Std. Error)
Our organization prioritizes resource allocation based on the criticality of project tasks.	222	1	5	3.18	.998	-.332	.163	-.301	.325
We have a clear framework for determining which projects or tasks receive resource priority.	222	1	5	3.35	1.025	-.508	.163	-.202	.325
Resource prioritization decisions in our company align with strategic project objectives.	222	1	5	3.30	1.107	-.398	.163	-.415	.325
The prioritization of resources helps our organization meet deadlines for high-priority projects.	222	1	5	3.17	1.065	-.315	.163	-.462	.325
Effective resource prioritization in our company minimizes delays in project execution.	222	1	5	3.27	1.023	-.374	.163	-.338	.325

Table 3 shows that respondents generally agree with statements on resource prioritization, with means ranging from 3.17 to 3.35. The highest agreement was for "We have a clear framework for determining which projects or tasks receive resource priority" (M = 3.35, SD = 1.025), suggesting structured prioritization processes. Negative skewness values (e.g., -0.508 for the framework item) indicate a slight tendency toward agreement. Standard deviations around 1.0 reflect moderate variability, suggesting some inconsistency in perceptions. Negative kurtosis values indicate flatter distributions, implying diverse opinions. These results suggest that while prioritization frameworks exist, their effectiveness in minimizing delays and aligning with objectives could be enhanced.

Table 4: Descriptive Statistics on Project Performance

Item	N	Min	Max	Mean	Std. Deviation	Skewness (Statistic)	Skewness (Std. Error)	Kurtosis (Statistic)	Kurtosis (Std. Error)
Our projects are consistently completed within the allocated budget, ensuring cost efficiency.	222	1	5	3.40	1.023	-.421	.163	-.307	.325
Effective resource planning enables our organization to meet project deadlines consistently.	222	1	5	3.44	1.008	-.546	.163	.077	.325
The quality of our project deliverables meets or exceeds client expectations and industry standards.	222	1	5	3.10	1.133	-.215	.163	-.751	.325
Proactive resource allocation minimizes delays and enhances the timely completion of project phases.	222	1	5	3.43	1.003	-.572	.163	-.025	.325
Our resource management strategies prioritize high-quality outcomes, contributing to the durability and functionality of projects.	222	1	5	3.54	.982	-.665	.163	.291	.325

Table 4 indicates generally positive perceptions of project performance. The highest mean was for "Our resource management strategies prioritize high-quality outcomes" (M = 3.54, SD = 0.982), followed closely by "Effective resource planning enables our organization to meet project deadlines consistently" (M = 3.44, SD = 1.008). Negative skewness values (e.g., -0.665 for quality outcomes) suggest a tendency toward agreement. The item on quality deliverables had the lowest mean (M = 3.10, SD = 1.133), with higher variability, indicating mixed perceptions about meeting quality standards. Negative kurtosis for most items suggests varied responses, highlighting areas for improvement in achieving consistent quality performance.

Bivariate Analyses

Table 5: Test of Relationships between Resource Optimization, Resource Prioritization, and Project Performance

			Resource Optimization	Resource Prioritization	Project Performance
Kendall's tau_b	Resource Optimization	Correlation Coefficient	1.000	.686**	.678**
		Sig. (2-tailed)	.	.000	.000
		N	222	222	222
	Resource Prioritization	Correlation Coefficient	.686**	1.000	.591**
		Sig. (2-tailed)	.000	.	.000
		N	222	222	222
	Project Performance	Correlation Coefficient	.678**	.591**	1.000
		Sig. (2-tailed)	.000	.000	.
		N	222	222	222

**. Correlation is significant at the 0.05 level (2-tailed).

Table 4.5 shows significant positive correlations between resource optimization, resource prioritization, and project performance. The strongest correlation is between resource optimization and project performance ($\tau = 0.678$, $p < 0.05$), suggesting that effective resource utilization strongly influences cost, time, and quality outcomes. Resource prioritization also correlates positively with project performance ($\tau = 0.591$, $p < 0.05$), indicating that prioritizing critical tasks enhances project success.

Discussion of Findings

Resource Optimization and Project Performance

The strong positive correlation ($\tau = 0.678$, $p < 0.05$) between resource optimization and project performance underscores the critical role of efficient resource utilization in enhancing cost, time, and quality outcomes in construction projects in Rivers State, Nigeria. This finding aligns with the Resource-Based View (RBV) Theory, which posits that strategic deployment of valuable and inimitable resources, such as skilled labor and advanced technology, drives organizational performance (Barney, 1991; Agyei et al., 2023). Kibagendi and Sang (2024) found that resource allocation significantly influences housing project performance in Kenya, particularly through effective human resource strategies, which supports the current study's emphasis on resource optimization. Techniques such as resource leveling and smoothing, as highlighted by Kibagendi and Sang (2024), are vital in balancing resource demand and availability, reducing idle time, and addressing prevalent challenges like cost overruns and delays in the Nigerian construction sector (Buba, 2023). Furthermore, the use of digital tools and real-time monitoring, as suggested by Kiungo and Otieno (2023), enhances dynamic resource adjustments, contributing to improved project efficiency and sustainability. However, accurate resource estimation remains a challenge, requiring continuous stakeholder coordination to align resources with project needs (Ahsun & Elly, 2024). The strong correlation in this study suggests that construction firms in Rivers State leveraging these optimization strategies can mitigate resource constraints and achieve competitive project outcomes, reinforcing RBV's focus on resource heterogeneity as a driver of performance (Wernerfelt, 1984).

Resource Prioritization and Project Performance

The moderate positive correlation ($\tau = 0.591$, $p < 0.05$) between resource prioritization and project performance indicates that allocating resources based on task criticality enhances project outcomes, though its impact is less pronounced than resource optimization. This finding is consistent with RBV Theory, which emphasizes strategic resource allocation to high-impact activities to achieve competitive advantage (Barney, 1991; Mustapha et al., 2023). In Rivers State's construction industry, where resource scarcity and project complexity are prevalent, prioritization techniques like ABC analysis and Pareto analysis help focus resources on time-sensitive or high-impact tasks, improving efficiency and stakeholder satisfaction (Agyei et al., 2023; Osamudiamen et al., 2022). Mustapha et al. (2023) noted that poor coordination can hinder project success, suggesting that effective prioritization, as found in this study, mitigates such risks by ensuring critical tasks are adequately resourced. However, challenges such as inaccurate prioritization and the need for continuous monitoring, as identified by Kibagendi and Sang (2024), may explain the moderate correlation, indicating inconsistent application of prioritization frameworks in some firms. By aligning resource allocation with strategic project objectives, as emphasized by Mustapha et al. (2023), construction firms can reduce delays and enhance

performance, though the less robust correlation suggests that prioritization alone may not fully address the multifaceted challenges of cost, time, and quality in Rivers State's construction sector (Osamudiamen et al., 2022).

Conclusion and Recommendations

The study demonstrated that effective resource management significantly enhances project outcomes. Specifically, a strong positive correlation ($\tau = 0.678$, $p < 0.05$) between resource optimization and project performance highlights the critical role of efficient resource utilization in achieving cost efficiency, timely delivery, and quality outcomes. A moderate correlation ($\tau = 0.591$, $p < 0.05$) between resource prioritization and project performance indicates that allocating resources to critical tasks improves project success, though less robustly. These findings underscore the importance of strategic resource management in navigating the resource-constrained and complex construction environment in Rivers State, aligning with the Resource-Based View Theory's emphasis on leveraging unique resources for competitive advantage.

i. To enhance resource optimization, construction firms should implement digital tools and training programs to improve resource allocation efficiency. Management can adopt project management software, such as Primavera or Microsoft Project, to enable real-time monitoring and resource leveling, ensuring balanced resource distribution and minimizing waste. Regular training workshops for project managers and site supervisors on optimization techniques, such as resource smoothing, can build capacity to address cost overruns and delays. Additionally, establishing a centralized resource database can facilitate accurate resource estimation and stakeholder coordination, reducing inefficiencies and supporting sustainable project outcomes.

ii. To strengthen resource prioritization, firms should develop clear frameworks, such as ABC or Pareto analysis, to prioritize high-impact project tasks. Management can create a prioritization committee to assess task criticality based on project objectives, ensuring resources are allocated to time-sensitive activities. Weekly project review meetings can help monitor and adjust prioritization in response to changing project conditions, minimizing delays. Integrating prioritization metrics, like the Schedule Performance Index, into project dashboards can enhance decision-making, ensuring alignment with strategic goals and improving overall project performance in Nigeria's construction sector.

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