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Research Article



ENHANCING PROJECT EFFICIENCY: A COMPREHENSIVE COURSEWORK ON CONSTRUCTION PROJECT MANAGEMENT STRATEGIES

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ABSTRACT

Aims: The aim of this study was to explore the relationship between construction project management strategies and project efficiency, with a specific focus on key strategies such as project planning, resource management, and risk mitigation. The research sought to determine whether the effective application of these strategies could enhance project efficiency in terms of time, cost, and quality outcomes, particularly in the context of the Philippine construction industry. Study design: This research utilized a correlational study design to examine the strength and direction of the relationship between construction project management strategies (independent variable) and project efficiency (dependent variable). The study involved surveying construction professionals to assess their perceptions of the effectiveness of various project management strategies in improving project performance. Methodology: A purposive sampling technique was employed to select a sample of 100 construction professionals who were directly involved in project management. Data was collected using structured surveys designed to assess participants' experiences with key management strategies and their perceived impact on project efficiency. The data was analyzed using Pearson's correlation coefficient to determine the statistical relationship between the strategies employed and the efficiency of construction projects. Results: The findings revealed a strong positive correlation (r = 0.722) between the application of project management strategies and the efficiency of construction projects, with a statistically significant p-value of 0.000. This indicates that the more effectively construction project management strategies are implemented, the more likely a project is to meet its time, cost, and quality objectives. Respondents expressed agreement that project planning, resource management, and risk management were essential to improving overall project efficiency. Conclusion: The study concluded that effective construction project management strategies significantly enhance project efficiency, particularly in terms of time, cost, and quality. Despite general agreement on the importance of these strategies, the research identified areas for improvement in their implementation, especially among smaller firms. Recommendations include investing in continuous training for construction professionals, adopting modern project management tools, fostering better collaboration among stakeholders, and integrating more proactive risk management practices to further optimize project outcomes.

Keywords: Construction Project Management, Project Efficiency, Resource Management, Risk Management, Philippines.

INTRODUCTION

The construction industry is undeniably one of the most crucial sectors in the global economy, contributing significantly to economic growth and employment opportunities. It is a central pillar in shaping infrastructure, whether roads, buildings, energy facilities, or other critical structures that drive national and international progress. According to the International Labour Organization (ILO, 2020), the construction industry accounts for approximately 13% of global Gross Domestic Product (GDP), a considerable portion of the world economy. However, despite its importance, the industry has long been plagued by inefficiencies that limit its potential. These inefficiencies, such as delays, cost overruns, and quality control issues, have stifled the sector's ability to reach its full productivity and economic impact (Ofori, 2020; Robinson *et al.*, 2021).

The demand for infrastructure has never been higher, particularly as countries worldwide strive to modernize and improve their urban areas, address climate change challenges, and meet the growing needs of their populations. As cities expand and new construction projects emerge, it becomes increasingly clear that traditional management methods are inadequate to address the complexities and scale of modern construction projects. Today's construction projects are larger, more complex, and demand higher levels of coordination among multiple stakeholders, making effective project

*Corresponding Author: AHMAD RAUF LAKIBUL PANDUGA, Philippine Christian University, Philippines. management more critical than ever (Chen *et al.*, 2020). For this reason, the industry is in dire need of more efficient, systematic, and innovative management strategies that can ensure the on-time and on-budget completion of projects without sacrificing quality or sustainability (Zuo *et al.*, 2020).

Globally, the construction industry faces various challenges that hinder its ability to operate efficiently. While the sector is instrumental in driving global development, it remains one of the least productive industries, especially regarding project efficiency. According to the World Economic Forum (WEF, 2020), productivity growth in construction has stagnated over the past few decades, far behind other sectors such as manufacturing and technology. Much of the industry still relies on outdated processes, manual labor, and fragmented workflows, often leading to inefficiencies, errors, and delays. Despite significant advancements in technology, including the introduction of tools like Building Information Modeling (BIM), automation, and Artificial Intelligence (AI), the widespread adoption of these technologies has been slow. The integration of such innovations has been challenging due to the industry's fragmented nature, which often includes diverse stakeholders such as contractors, subcontractors, suppliers, and project owners, each of whom manages their part of the project (Kiviniemi et al., 2020; Mahalingam et al., 2021).

The push for smart cities, sustainable construction, and green building practices has gained momentum in the international context, particularly in developed countries. These initiatives emphasize efficiency and sustainability, aiming to minimize environmental impacts and optimize the use of resources throughout the lifecycle of a project (Hasan *et al.*, 2021; Mollah *et al.*, 2022). As cities grow and evolve, adopting advanced project management methodologies like Integrated Project Delivery (IPD) and Lean Construction is becoming increasingly important. IPD fosters collaboration and accountability across all project stakeholders, creating a shared responsibility for project success. This approach has been widely adopted in countries like the United States, the United Kingdom, and Canada, where integrated project teams work together from their inception to their completion, minimizing delays and improving overall performance (Zhang *et al.*, 2021).

Despite these advancements, adopting such strategies has been less widespread in developing nations, where the construction industry relies on traditional management techniques. The implementation of advanced technologies and management strategies has been hampered by factors such as the high cost of implementation, lack of skilled professionals, and insufficient infrastructure to support these innovations (Brunoehler *et al.*, 2021). Thus, while countries in the global North are adopting cutting-edge construction technologies and methods, many countries in the global South, including the Philippines, continue to grapple with inefficiency and a lack of innovation (Manalo *et al.*, 2022).

One promising development internationally is the rise of digital technologies that promise to revolutionize construction project management. BIM, for example, has gained significant traction in regions like Europe and North America, offering significant improvements in project planning, coordination, and execution. BIM allows all stakeholders to collaborate within a single digital model, reducing errors, improving communication, and enhancing project transparency. However, adopting BIM and similar technologies in developing nations is still early, often constrained by cost and the lack of necessary infrastructure (Cheng *et al.*, 2020).

In the Philippines, the construction industry has become a cornerstone of the nation's economic growth, particularly in recent years. The Philippine government's "Build, Build, Build" program, initiated in 2017, has injected substantial investments into infrastructure development, including roads, bridges, airports, and urban development. This initiative has significantly boosted the construction industry, leading to the rapid expansion of construction projects nationwide. With a growing demand for residential, commercial, and public infrastructure projects, the Philippine construction sector faces the challenge of improving project efficiency to meet the increasing demands of urbanization and development (Delgado & de Guzman, 2022).

Despite this growth, the Philippine construction industry has consistently faced project delays, cost overruns, and inefficiencies. According to the Philippine Constructors Association (PCA, 2019), approximately 60% of construction projects in the country experience significant delays, with many projects exceeding their budgets by more than 20%. These delays often result from poor project planning, lack of stakeholder coordination, inadequate risk management, and insufficient resource management practices (Sanchez et al., 2020; Castro & Ibarra, 2021). Additionally, issues such as corruption, the lack of skilled labor, and outdated project management practices contribute to the overall inefficiency of the sector (Reyes & Valdez, 2021). While booming, the construction industry in the Philippines continues to operate using traditional management strategies that emphasize cost control and time management but often neglect the integration of risk management and resource optimization. While applicable in specific contexts, conventional methods are inadequate

in managing the increasing complexity of modern construction projects (Santos & Uy, 2020). The failure to incorporate advanced project management methodologies, such as Integrated Project Delivery (IPD), Lean Construction, and technology like Building Information Modeling (BIM), has led to a continued struggle in optimizing project efficiency (Liu & Lee, 2020).

Furthermore, the rapid urbanization of cities like Metro Manila has greatly strained the construction industry. The demand for infrastructure, exceptionally affordable housing, public transport, and other essential facilities has surged. This has further complicated the challenge of delivering projects on time and within budget (Villegas *et al.*, 2021). As the construction sector grows, there is a pressing need for construction professionals to adopt more modern and effective project management strategies to ensure that projects are completed efficiently (Andres *et al.*, 2021).

Despite the government's efforts to modernize the industry and attract foreign investment, the lack of a comprehensive educational framework for construction management remains a significant barrier. While some training programs exist, many focus on traditional project management skills, with little emphasis on advanced techniques such as resource management and risk mitigation. This gap in education and training means that many construction professionals in the Philippines are still ill-prepared to tackle the complexities of modern construction projects. As a result, the industry continues to rely heavily on outdated practices, which impede progress and innovation (Bautista *et al.*, 2021).

While the issues of cost overruns, delays, and inefficiency in the Philippine construction industry are well-documented, there remains a significant gap in research on addressing these challenges through modern project management strategies. Much of the existing literature on the Philippine construction industry focuses on identifying the problems but offers few practical solutions (Alvarez & Dela Cruz, 2022). There is also limited research on applying advanced project management strategies in the local context, particularly in integrating project planning, resource management, and risk management (Escalante *et al.*, 2020).

The integration of modern project management practices, such as Lean Construction, Integrated Project Delivery (IPD), and technology like Building Information Modeling (BIM), remains underexplored in the Philippine context. Although there is increasing awareness of these techniques, their application has been slow, especially in smaller construction firms, which may lack the resources or expertise to implement them effectively (Bismark *et al.*, 2021). Additionally, while several training programs exist, they often fail to provide a comprehensive and cohesive approach that combines all the critical elements of modern project management (Diaz & Reyes, 2020).

This research aims to fill this gap by developing a comprehensive coursework on construction project management strategies that integrates project planning techniques, resource management, and risk management. By offering a structured educational framework, this study will provide construction professionals with the tools they need to improve project efficiency and achieve better outcomes in terms of time, cost, and quality. Moreover, this study will examine the impact of these integrated strategies on key performance indicators, such as the completion time, project costs, and quality of deliverables (Torres *et al.*, 2021; Dizon & Magtibay, 2021).

Theoretical Framework

The study was anchored on the Theory of Project Management Efficiency (Kerzner, 2017) for the Independent Variable (IV) -Construction Project Management Strategies, and the Theory of Project Success (Cooke-Davies, 2002) for the Dependent Variable (DV) - Project Efficiency. The Theory of Project Management Efficiency posited that the application of effective project management strategies, including strategic planning, resource management, and risk mitigation, enhanced project outcomes by reducing inefficiencies, controlling costs, and ensuring timely completion (Lee et al., 2023). These strategies were central to achieving project success, particularly in construction projects where coordination of scope, time, cost, and quality was crucial (Vargas et al., 2023). In turn, the Theory of Project Success argued that project efficiency was measured by the successful balance of time, cost, and quality, with efficiency being directly influenced by the management strategies employed (Sharma & Mehta, 2023). The study drew on these theories to explore how the implementation of construction project management strategies impacted the efficiency of construction projects, specifically in terms of timeliness, costeffectiveness, and quality of deliverables (Lo et al., 2023; González et al., 2023).

The Conceptual Framework of this study examined the relationship between Construction Project Management Strategies (Independent Variable, IV) and Project Efficiency (Dependent Variable, DV). Construction Project Management Strategies included essential components such as Project Planning Techniques, which established clear goals, schedules, and budgets; Resource Management, which ensured optimal utilization of human and material resources; and Risk Management Strategies, which helped identify and mitigate potential project risks (Mills & Rojas, 2023). These strategies directly influenced project efficiency by enhancing Time Efficiency, ensuring projects were completed on schedule, Cost Efficiency, maintaining adherence to budget constraints without sacrificing quality, and Quality of Deliverables, ensuring that the final output met the required standards (Hernandez & Tan, 2023; Robinson et al., 2023). The framework suggested that the effective implementation of these strategies led to improved project efficiency, optimizing time, cost, and quality outcomes (Zhang et al., 2023; Silva et al., 2023). Therefore, the study explored how these management strategies contributed to the overall efficiency of construction projects, providing a comprehensive understanding of their impact on project success (Yung et al., 2023).

METHODOLOGY

This study employed a correlational research design to examine the relationship between Construction Project Management Strategies (Independent Variable) and Project Efficiency (Dependent Variable). The correlational design was appropriate for this research as it enabled the identification of the strength and direction of the relationship between the two variables, specifically how the application of construction project management strategies influenced project efficiency, including time management, cost control, and quality of deliverables (Martínez et al., 2023; Pugh et al., 2023). By exploring this relationship, the study aimed to determine whether the use of specific project management strategies was associated with improvements in the efficiency of construction projects (Hwang & Li, 2023). A purposive sampling technique was utilized to select a sample of 100 respondents who were directly involved in construction project management. This method was ideal as it targeted individuals with relevant experience and knowledge of the subject matter. Participants included project managers, construction engineers,

contractors, and other professionals who had significant involvement in managing construction projects. This sampling approach ensured that the data collected was both relevant and reflective of the professional practices in the field (Carvalho *et al.*, 2023). Data was gathered through structured surveys, designed to assess the participants' experiences with construction project management strategies and their perceived effectiveness in improving project efficiency. The surveys included questions regarding the use of project planning techniques, resource management, and risk management strategies, as well as the level of project efficiency in terms of time, cost, and quality outcomes. A sample size of 100 respondents was sufficient to provide meaningful insights while maintaining manageability and focus for data analysis (Singh *et al.*, 2023).

The data collected was analyzed using Pearson's correlation coefficient to assess the strength and direction of the relationship between the independent and dependent variables. This statistical method helped determine if there was a significant correlation between the strategies employed in construction project management and the overall efficiency of the projects. The findings provided valuable insights into the impact of specific project management practices on the success and efficiency of construction projects (Lee & Zhang, 2023).

RESULTS AND DISCUSSIONS

1. What is the perceived level of Construction Project Management Strategies among the respondents?

Table 1 presents the summary of the perceived level of Construction Project Management Strategies among the respondents, revealing that all three components-Project Planning Techniques, Resource Management, and Risk Management Strategies-were perceived positively, with mean scores indicating agreement. The overall mean score of 3.20 (SD = 0.69) suggests that the respondents generally agreed with the relevance and application of these strategies in their daily work. Specifically, Project Planning Techniques scored the highest mean of 3.25 (SD = 0.68), highlighting the importance placed on thorough planning in ensuring the success of construction projects. Proper project planning, including clear objectives, realistic timelines, and a structured allocation of resources, serves as the foundation for achieving project goals and mitigating delays and cost overruns (Jang & Kim, 2022; Li et al., 2023). Effective planning has long been associated with improved project outcomes, including better time management and cost control (Zhao et al., 2022).

Resource Management received a mean of 3.17 (SD = 0.69), which reflects the respondents' acknowledgment of the critical role that managing human, material, and financial resources plays in project efficiency. Effective resource management ensures that projects do not face delays due to shortages or misallocation of resources, thus contributing to the overall timeliness and cost-effectiveness of projects (Goh *et al.*, 2023; Kumar & Sharma, 2022). Effective resource allocation, particularly in the face of limited budgets and labor shortages, has been shown to significantly affect the delivery of construction projects on time and within budget (Nguyen *et al.*, 2023). Furthermore, the application of resource management practices has been linked to improved communication and coordination, which are critical in minimizing inefficiencies (Brown *et al.*, 2023).

Similarly, Risk Management Strategies scored 3.19 (SD = 0.72), indicating that respondents recognize the importance of anticipating and mitigating potential risks throughout the project lifecycle. Effective risk management practices, such as identifying potential hazards,

planning for contingencies, and monitoring risks during the execution phase, are essential for minimizing disruptions and ensuring the project's success in budget and time constraints (Martinez & Zhang, 2022). Effective risk management has been identified as a crucial factor in reducing project delays and cost overruns, particularly in large-scale construction projects (Lee *et al.*, 2022). The integration of advanced risk management strategies, such as real-time risk monitoring and predictive analytics, has contributed to more successful project outcomes (Liu *et al.*, 2023).

These results imply that while respondents generally agreed on the importance of these project management strategies, the consistency and effectiveness of their application might vary. The relatively close mean scores and moderate standard deviations suggest that while these strategies are valued, there may be room for improvement in their full-scale implementation, particularly among small and medium-sized firms that might lack the resources or expertise to apply them comprehensively (Anderson *et al.*, 2023). To further enhance construction project efficiency, there is a need for continuous professional development and targeted training in these areas, emphasizing not only their theoretical importance but also practical and contextual applications (Tan & Lee, 2022). Strengthening these strategies, especially in resource-constrained settings, could improve project performance, reduce costs, enhance quality, and consistently meet deadlines (Wang *et al.*, 2022; Poon *et al.*, 2023).

 Table 1. The Summary of the perceived level of Construction

 Project Management Strategies among the respondents

ltems	Mean	SD	Description
Project Planning Techniques	3.25	0.68	Agree
Resource Management	3.17	0.69	Agree
Risk Management Strategies	3.19	0.72	Agree
Overall Mean	3.20	0.69	Agree

Legend: 1.00 – 1.75 (Strongly Disagree), 1.76 – 2.50 (Disagree), 2.51 – 3.25 (Agree), 3.26 – 4.00 (Strongly Agree)

2. What is the level of project efficiency in construction projects as perceived by the respondents?

Table 2 summarized the perceived level of Project Efficiency in construction projects as perceived by the respondents. The overall mean score of 3.11 (SD = 0.76) indicated that respondents generally agreed with the effectiveness of the project efficiency measures in their construction projects (Martínez et al., 2022). Specifically, Time Efficiency scored a mean of 3.14 (SD = 0.87), reflecting that respondents agreed that managing and meeting project deadlines was a key priority in construction projects. While this indicated a positive perception of time management, the higher standard deviation suggested there may be varying levels of success in meeting deadlines, possibly due to differing project complexities, team coordination, or resource availability (Zhao et al., 2021; Wong et al., 2023). Several studies have shown that time efficiency can be influenced by factors like the complexity of tasks, the experience of project managers, and the effectiveness of project planning techniques (Liu et al., 2021).

Cost Efficiency received a mean of 3.13 (SD = 0.63), suggesting that respondents perceived construction projects to generally meet budgetary expectations. This indicated that cost control practices were being effectively applied, though there were still instances where unforeseen expenses or budget overruns occurred (Jang & Kim, 2022). The relatively lower standard deviation reflected a more consistent perception across respondents regarding cost

management effectiveness (Wang *et al.*, 2022). However, challenges such as fluctuations in material costs or labor rates continued to influence the final project cost, a challenge that has been widely discussed in recent literature (Nguyen *et al.*, 2023; Goh *et al.*, 2023). A robust project budgeting process and continuous cost monitoring have been found to mitigate such budget overruns in construction projects (Martínez & Zhang, 2023).

The Quality of Deliverables scored the lowest mean of 3.08 (SD = 0.78), indicating agreement that the guality of the construction deliverables met the required standards, though with some variability in respondent perception (Li et al., 2022). This suggested that while most respondents believed that the quality of the work met expectations, there were occasional challenges in maintaining highquality standards across all aspects of the project. Factors such as time pressures, resource constraints, and the involvement of subcontractors could contribute to these variations in perceived quality (Kumar & Sharma, 2022; Hwang & Li, 2023). The quality issues observed in construction projects have been attributed to poor coordination, lack of skilled labor, and inadequate inspection processes (Robinson et al., 2022). Several studies have emphasized the importance of implementing stronger quality control mechanisms, particularly in high-stakes or complex construction environments (Zhang et al., 2022).

These results implied that, while respondents generally perceived their projects as being efficient in terms of time, cost, and quality, there were areas where improvements could be made, particularly in ensuring that projects consistently meet quality standards and deadlines (Jiang & Lee, 2022). The variability in perceptions, especially in time efficiency and quality of deliverables, suggested that construction projects could benefit from stronger project monitoring and more rigorous quality control measures (Zhang *et al.,* 2023). Enhancing coordination among teams, increasing resource availability, and adopting better time management practices could improve project efficiency, reduce delays, minimize costs, and ensure higher-quality outputs in future projects (Poon *et al.,* 2023). Li *et al.,* 2023).

Table 2. The summary of the level of project efficiency in construction projects as perceived by the respondents

Items	Mean	SD	Description
Time Efficiency	3.14	0.87	Agree
Cost Efficiency	3.13	0.63	Agree
Quality of Deliverables	3.08	0.78	Agree
Overall Mean	3.11	0.76	Agree

Legend: 1.00 – 1.75 (Strongly Disagree), 1.76 – 2.50 (Disagree), 2.51 – 3.25 (Agree), 3.26 – 4.00 (Strongly Agree)

3. Is there a significant relationship between Construction Project Management Strategies and project efficiency?

Table 3 presented the results of the Test of the Significant Relationship between Construction Project Management Strategies and Project Efficiency. The r-value of 0.722 indicated a strong positive correlation between the two variables, which suggested that the implementation of construction project efficiency (Nguyen *et al.*, 2022; Zhang *et al.*, 2023). This means that as project management strategies such as planning, resource allocation, and risk mitigation were applied more effectively, the efficiency of construction projects, in terms of time, cost, and quality, also improved (Li *et al.*, 2021).

Studies have consistently shown that effective project planning and resource management directly contribute to better project outcomes, such as meeting deadlines and controlling costs (Martínez *et al.*, 2022).

The p-value of 0.000, well below the typical significance threshold of 0.05, indicated that the relationship was statistically significant (Zhao *et al.*, 2021). As a result, the null hypothesis (Ho), which proposed no significant relationship between the two variables, was rejected, and we accepted the alternative hypothesis that an important relationship did exist (Hwang & Li, 2023). Statistical significance supports the argument that the application of systematic project management strategies plays a crucial role in enhancing project efficiency, a finding that has been corroborated by recent studies (Wong *et al.*, 2023; Liu *et al.*, 2021).

These findings implied that effective project management strategies were key to construction project efficiency. With a strong correlation identified, the results suggested that projects managed with precise planning, efficient resource management, and proactive risk management strategies were more likely to meet their objectives, stay within budget, adhere to timelines, and produce high-quality outcomes (Goh *et al.*, 2023). Several recent studies have emphasized that a robust project management approach, particularly one incorporating risk identification and resource optimization, leads to improved project performance (Martínez & Zhang, 2022).

Furthermore, the statistical significance of the relationship emphasized the importance of incorporating comprehensive management practices to enhance project success (Tan & Lee, 2022). In practice, this meant that construction companies should prioritize these strategies and continually refine their approach to project management to maximize efficiency. As shown in recent research, the integration of project management methodologies such as Lean Construction, Integrated Project Delivery (IPD), and Building Information Modeling (BIM) significantly enhances efficiency and reduces waste in construction projects (González *et al.*, 2022).

This research also suggested that improving the understanding and application of these strategies in the Philippine construction sector could significantly reduce inefficiencies and improve the overall performance of construction projects (Anderson *et al.*, 2023). Thus, organizations should invest in training and capacity-building efforts to ensure that project managers have the necessary skills to implement these strategies effectively (Li *et al.*, 2023). Enhancing project management capabilities, particularly in resource-constrained environments, could substantially increase the efficiency and success rates of construction projects (Kumar & Sharma, 2022).

Table 3. The Test of the significant relationship between Construction Project Management Strategies and project efficiency

	Project Efficiency			
	r- value	p- value	Decision on Ho	
Construction Project Management Strategies	.722**	.000	Rejected	

Significant if P-value <0.05

Legend: Ho is rejected if Significant Ho is accepted if Not Significant

CONCLUSION

This study explored the relationship between Construction Project Management Strategies and Project Efficiency in the construction industry, focusing on key strategies such as project planning, resource management, and risk management. The results indicate a strong positive correlation between the effective implementation of project management strategies and the efficiency of construction projects. The analysis revealed that project efficiency, measured by time, cost, and quality, is significantly influenced by how well these strategies are applied. Respondents generally agreed on the importance of planning techniques, resource management, and risk mitigation, suggesting that these strategies are vital for successful project outcomes. Despite this, there is still room for improvement in fully optimizing the application of these strategies, particularly in smaller construction firms with limited resources or expertise.

The statistical findings confirmed a significant relationship between project management strategies and project efficiency, rejecting the null hypothesis. This implies that better application of project management practices leads to higher efficiency in construction projects. The study contributes to the understanding that strategic management practices are integral to the success of construction projects and that enhancing these strategies can lead to improved project outcomes in terms of time, cost, and quality.

Recommendations

- Enhanced Training and Development: To improve the application of construction project management strategies, it is recommended that construction professionals undergo continuous training programs that focus on advanced project management techniques. These programs should emphasize the integration of project planning, resource management, and risk mitigation strategies, with a focus on practical application tailored to the specific challenges of the Philippine construction industry.
- Adoption of Modern Project Management Tools: It is recommended that construction firms, especially small and medium-sized enterprises, invest in modern project management tools and technologies such as Building Information Modeling (BIM) and project management software. These tools can assist in improving project planning, resource allocation, and risk management, making it easier to monitor and control project efficiency in real-time.
- 3. Strengthening Collaboration and Communication: Successful project management in construction requires effective communication and collaboration among stakeholders. Construction companies should foster a culture of teamwork by improving communication channels among project managers, contractors, subcontractors, and clients. This can be achieved through regular meetings, updates, and collaborative platforms that ensure all parties are aligned and informed throughout the project lifecycle.
- 4. Fostering a Proactive Risk Management Culture: Risk management should be a core component of construction project management. It is recommended that construction firms implement more proactive risk management practices, including regular risk assessments, mitigation strategies, and contingency plans. This will help reduce unexpected delays and budget overruns, enhancing the overall efficiency of projects.

5. Continuous Evaluation and Feedback Mechanism: Finally, it is recommended that construction firms establish a continuous evaluation and feedback mechanism to assess the effectiveness of their project management strategies. Regular post-project evaluations and performance reviews can provide valuable insights into areas for improvement, helping firms refine their strategies and implement best practices in future projects.

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