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Challenges Encountered and Management Strategies of Contractors in Handling Multiple Construction Projects

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Abstract

Managing multiple construction projects has become a defining challenge in the Philippine construction industry, particularly in Laguna, where contractors face overlapping schedules, shared resources, and diverse stakeholder demands. This study investigates the common problems encountered and the management strategies employed to address them. A mixed-methods design was adopted, combining quantitative surveys and qualitative recommendations from 50 contractors, project managers, and engineers. The instrument measured challenges in resource allocation, prioritization, communication, and scope management, while open-ended responses provided insights into recommended solutions. Weighted mean analysis and thematic coding were used to interpret the data. Findings revealed that contractors frequently encounter issues in specialized skill shortages, equipment delays, miscommunication, and scope changes. Resource allocation and communication barriers were the most pressing concerns, with language and cultural differences exacerbating collaboration difficulties. Scope creep was also identified as a recurring problem. To mitigate these challenges, contractors applied strategies such as centralized project management offices, comprehensive resource assessments, prioritization frameworks, and project management software. Continuous communication and clear objectives were also emphasized as critical to success. The study highlights the importance of structured planning, adaptive leadership, and technological integration in multi-project management. Strategies, such as Lean–Agile approaches, BIM integration, and sustainability-driven practices, were identified as promising solutions to enhance efficiency and reduce risks. Effective management of multiple construction projects requires proactive resource planning, disciplined scope control, and collaborative communication systems. The proposed action plan underscores the need for continuous improvement and digital transformation to strengthen industry practices.

Keywords: multi-project management, resource allocation, communication barriers, scope creep, construction strategies, project portfolio management

INTRODUCTION

Multitasking in construction is distinct from other industries because it requires contractors, project managers, and engineers to coordinate resources, schedules, and problem-solving across multiple sites simultaneously. Overlapping timelines, shared manpower and equipment, and concurrent stakeholder demands make Multi-Project Management (MPM) and Project Portfolio Management (PPM) essential. When managed effectively, construction multitasking optimizes resource use and performance, but poor coordination can lead to scheduling conflicts, productivity losses, and heightened risks (Zou et al., 2007; Ling & Hoi, 2006; Ju & Rowlinson, 2014; Bajjou & Chafi, 2022).

Project success in construction is often measured by cost control, resource productivity, and risk management. Handling multiple projects simultaneously affects these indicators at the portfolio level. Delays in one project can disrupt shared resource schedules, cost overruns can strain finances across sites, and unforeseen risks can cascade through multiple projects. Poor MPM therefore jeopardizes not just individual projects but the organization's overall performance, underscoring the importance of effective portfolio-level management strategies.

At the individual level, contractors and project managers face significant pressure when juggling multiple construction projects, which can lead to inefficiencies if not managed well. This highlights the need to understand multitasking behavior among construction professionals in both project and portfolio contexts. While studies have examined risks and challenges in construction across different countries (Zou et al., 2007; Ling & Hoi, 2006; Ju & Rowlinson, 2014; Bajjou & Chafi, 2022), there remains a gap in research on how contractors in the Philippine setting manage multiple projects as a portfolio and how these practices affect key performance indicators. The present study addresses this gap, aiming to identify challenges and management solutions that can strengthen industry practices and provide valuable insights for contractors, supervisors, and the broader construction sector.

LITERATURE REVIEW

Strategies. In this study, strategies were defined as the actions, techniques, and decision-making processes contractors, project managers, and engineers use to achieve project goals efficiently. These extend beyond organizational policies to include practices such as coordinating activities across sites, allocating resources, adjusting timelines, and resolving conflicts. Gómez Sánchez et al. (2023) analyzed the Resource-Constrained Multi-Project Scheduling Problem (RCMPSP), showing how overlapping tasks and shared resources create scheduling conflicts, and emphasized heuristic and metaheuristic techniques for near-optimal scheduling, resource allocation, and workload balancing. Adaptive strategies like real-time scheduling modifications, modeling uncertainty, and dynamic resource allocation were also identified as crucial for addressing disruptions such as weather, labor shortages, and material delays. Deloitte (2024) further highlighted workforce shortages and fragmented planning as major challenges, recommending digital transformation through smart jobsite technologies, digital twins, and AI-enabled design tools to improve coordination and productivity. They also stressed workforce development and integrated planning systems to address operational fragmentation. For contractors, these findings underscore the importance of organized planning, effective workforce allocation, and collaboration tools that enable real-time tracking and proactive risk management, ultimately reducing inefficiencies, mitigating risks, and improving the likelihood of completing projects on time and within budget.

Handling Problems. Handling problems in multi-project construction management is shaped by leadership style and adaptive methodologies. Ochieng and Price (2022) highlight transformational leadership as most effective, fostering team cohesion, motivation, and adaptability, which are critical for managing resource constraints, scheduling conflicts, and stakeholder demands across multiple sites. Unlike transactional leadership, which lacks flexibility, or laissez-faire leadership, which often leads to poor accountability, transformational leaders reduce inter-project friction by promoting shared vision, open communication, and empowering initiative. Complementing this, Power, et al (2024) demonstrate the benefits of integrating Lean and Agile methods, such as the Last Planner System, Takt planning, and Scrum, to improve productivity, planning reliability, and coordination. Their pilot study shows that hybrid Lean–Agile strategies enhance responsiveness through collaborative planning, real-time feedback, and iterative execution, resulting in more consistent Planned Percent Complete (PPC) and fewer delays. For contractors, these approaches provide practical solutions to fragmented communication, schedule variability, and inefficient resource use, ultimately reducing waste and improving overall project performance.

Resource Allocation. Resource allocation is a critical factor in multi-project construction management, where concurrent activities often face constraints. Aghileh, et al (2025) emphasized that unpredictable factors such as shifting resource availability, supply delays, and

weather disruptions make deterministic scheduling inadequate, highlighting the need for resource flexibility through reallocating multiskilled personnel, sharing equipment, and cross-training employees. They recommended hybrid algorithms combining management intuition with optimization tools, alongside flexible planning, real-time coordination, and decision-support systems to balance time, cost, and resource use. Kang and Kim (2024) found that AI-powered systems using machine learning and predictive analytics can improve resource planning, reduce cost overruns by up to 11%, and optimize labor and material utilization. Similarly, Al Taie, et al (2024) demonstrated the effectiveness of the Last Planner System (LPS) in disruptive environments such as Iraqi conflict zones, reporting significant improvements in planning accuracy, safety, quality, and waste reduction, with 75% noting better planning and quality, 65% improved safety, and 95% reduced waste. Collectively, these studies show that contractors benefit from AI-driven tools, flexible resource strategies, and Lean Construction frameworks to minimize delays, strengthen coordination, and maintain performance even in unstable or resource-limited environments.

Prioritization and Time Management. Prioritization and time management are crucial in multi-project construction, where adaptability directly impacts outcomes. Martinsuo and Huemann (2022) note that inter-organizational settings intensify challenges such as resource conflicts, fragmented information flows, and misaligned incentives, with contractors often facing supplier dependencies, unclear authority, and competing demands that cause delays and disputes. Addressing these issues requires strategies beyond internal scheduling, including formal governance, contractual alignment, shared information systems, and relational management across firm boundaries. Zhang and Liu (2025) provide evidence from China's construction industry showing that centralized digital platforms for cross-project resource sharing reduce idle time and improve equipment utilization. Their simulation-based analysis highlights the benefits of data-driven coordination, real-time tracking, and predictive scheduling, enabling contractors to forecast requirements, balance workloads, and minimize downtime. These findings underscore the importance of technological integration and coordinated planning to enhance efficiency, reduce operational inefficiencies, and achieve smoother project delivery in complex multi-project environments.

Communication and Collaboration. Communication and collaboration are essential in multi-project construction management, where leadership and adaptability directly shape outcomes. Jääskä, et al (2024) emphasize that many challenges stem from the human side of management, highlighting adaptive leadership, stakeholder engagement, open communication, and organizational readiness as key to success. Incorporating change management practices, such as participative decision-making, proactive communication, and flexible leadership, helps contractors reduce conflict, sustain morale, and manage overlapping projects. Hassan and Omar (2023) similarly found that project managers' leadership, coordination, and communication skills strengthen stakeholder cooperation, reduce misunderstandings, and enable timely information exchange. Building on these insights, Alnajjar, et al (2025) developed a framework integrating Building Information Modeling (BIM), Lean Construction, and emerging technologies, validated with a 20% reduction in rework, improved stakeholder satisfaction, and stronger decision-making. By combining BIM's data-rich modeling, Lean's waste-reduction strategies, and digital automation tools, contractors can overcome inefficiencies, fragmented workflows, and poor coordination, promoting real-time collaboration, lifecycle optimization, and process efficiency. Collectively, these studies underscore that managerial competence, adaptive leadership, and technological integration are strategic elements for success in complex multi-project construction environments.

Scope and Scope Creep. Scope and scope creep are critical in multi-project construction management, as they directly affect alignment with organizational goals. Crawford and Pollack (2023) emphasized the need for clear frameworks for accountability, decision-making, and performance evaluation, noting challenges such as overlapping authorities, competing priorities, uneven resource distribution, and poor communication that often cause inefficiencies and delays. For contractors, applying portfolio governance concepts ensures transparent decision-making, centralized coordination, and effective resource distribution. Complementing this, Wang et al. (2023) showed that integrating Building Information Modeling (BIM) reduces change orders by 15%, improving efficiency and minimizing delays and cost overruns, while León (2025) demonstrated that combining BIM with structural analysis reduces scheduling conflicts, miscommunication, and design inconsistencies. By serving as a hub for interdisciplinary collaboration, BIM enables proactive conflict resolution, real-time monitoring, and streamlined decision-making. Together, these studies highlight that BIM integration and portfolio governance are essential strategies for mitigating scope creep, strengthening collaboration, and ensuring efficient delivery across multiple construction projects.

Management Strategies Used by Contractors to Solve Problems When Handling Multiple Construction Projects. Li, et al (2024) highlight sustainability as a strategic tool in multi-project construction management, showing how green building practices, stakeholder participation, and sustainable resource use improve efficiency by reducing waste, optimizing resources, and enhancing long-term cost-effectiveness. By integrating sustainability into design, procurement, and execution, contractors can track objectives with digital tools, manage risks, and meet deadlines while addressing resource scarcity and compliance. Complementing this, Ahn and Suh (2022) examined hybrid scheduling in South Korea's infrastructure projects, combining the Critical Path Method (CPM) with Agile principles to enhance flexibility, coordination, and responsiveness compared to traditional linear scheduling. Their findings show that incorporating interactive planning, continuous communication, and collaborative decision-making into CPM's structured framework helps teams handle unexpected challenges, minimize conflicts, and optimize resource use. Together, these studies demonstrate that sustainability-driven strategies and CPM–Agile hybrid scheduling tools enable contractors to improve adaptability, real-time communication, and proactive problem-solving, ultimately strengthening coordination and efficiency in complex multi-project construction environments.

Other Recommended Management Solutions when Handling Multiple Construction Projects. Hu et al. (2024) examined how collaborative decision-making tools and multi-agent systems (MAS) transform coordination in construction, showing that conventional hierarchical structures often cause inefficiencies and delays in multi-project contexts. Their study identified distributed optimization, collaborative scheduling, and agent-based modeling as tools that allow autonomous agents to negotiate, allocate resources, and resolve disputes in real time, reducing reliance on a single project manager while fostering transparency and responsiveness. For contractors, MAS offers innovative solutions to resource conflicts, communication breakdowns, and coordination issues, aligning with modern practices such as BIM integration, automation, and lean planning. Complementing this, Peng et al. (2023) introduced the Multi-Skill Resource-Constrained Multi-Modal Project Scheduling Problem (MRCMPSP), using a hybrid quantum particle swarm optimization (HQPSO) algorithm to show that flexible resource assignments, where workers possess multiple skills, can reduce project delays by up to 12%. Their findings highlight that multi-skilled workforce strategies improve scheduling flexibility, accuracy, and convergence performance compared to traditional models. Together, these studies demonstrate that adopting MAS

frameworks, advanced scheduling algorithms, and multi-skilled labor deployment provides contractors with practical solutions to resource limitations, coordination challenges, and scheduling conflicts, ultimately enhancing efficiency in multi-project construction management.

Action Plan for the Management Strategies Application when Handling Multiple Construction Projects. Agrawal et al. (2024) investigated lean construction through automation of the Last Planner System (LPS), showing how digital tools enhance collaboration, scheduling, resource allocation, and real-time monitoring while fostering accountability, transparency, and continuous improvement. Automated LPS improves coordination among suppliers, subcontractors, and contractors, reducing delays and rework, and providing a cooperative framework for managing multiple projects. Similarly, Power, et al (2024) proposed a hybrid Lean–Agile model combining LPS, Takt production, and Scrum to strengthen communication, flexibility, and workflow predictability through collaborative scheduling, continuous balancing, and adaptive problem-solving. Broader industry studies reinforce these approaches: McKinsey & Company (2024) identified digital twins, AI-enabled design, and smart worksite technology as key drivers of productivity and risk reduction amid labor shortages, while Van Eynde and Vanhoucke (2023) examined the Stochastic Resource-Constrained Multi-Project Scheduling Problem (RCMPSP), showing that heuristic-based priority rules significantly improve scheduling efficiency under uncertainty. Collectively, these studies demonstrate that lean automation, hybrid Lean–Agile models, digital transformation, and heuristic scheduling techniques are essential strategies for contractors to overcome overlapping timelines, resource shortages, and unpredictable site conditions, ensuring more efficient and reliable multi-project management

Theoretical Framework. The present study is anchored in Prospect Theory by Kahneman (1979), which explains how individuals make decisions under risk, particularly financial risk, by weighing losses more heavily than gains. In construction, contractors, engineers, and managers constantly face uncertainty from schedule disruptions, scope changes, and resource constraints, requiring them to prioritize projects, allocate resources, and control costs. Prospect Theory clarifies why decision-makers often choose actions that minimize losses, even at the expense of overall efficiency, and how limited attention affects prioritization when multiple projects compete for time and resources. By framing contractor behavior in terms of risk perception and cognitive effort, the theory provides a foundation for understanding how decisions are made in environments with overlapping schedules, shared resources, and simultaneous stakeholder demands, offering insight into why certain challenges persist despite management strategies.

Conceptual Framework. Figure 1 shows the conceptual framework of the study, specifically indicating the utilization of the Input-Process-Output paradigm. The study's input includes feedback from managerial positions in construction firms on problems encountered and management strategies for handling multiple construction projects, particularly in Resource Allocation, Prioritization and Time Management, Communication and Collaboration, and Scope and Scope Creep. The study's process involves distributing the survey questionnaire, using descriptive statistics, and thematic analysis to analyze respondents' answers and feedback. The output of the study is the management strategies, management solution, and the Action Plan.

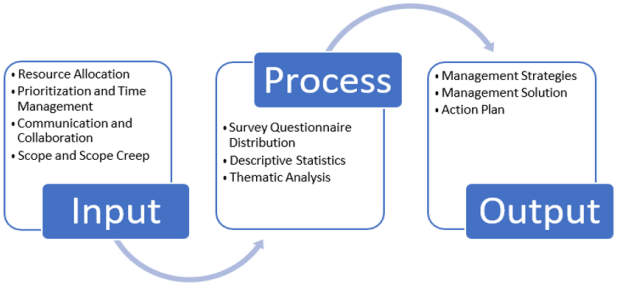

Figure 1
Research Paradigm

The present study aims to determine the contractors' perspectives on the challenges they encountered and the management strategies they used to handle multiple construction projects.

Specifically, the study aims to answer the following questions:

1. What are the common problems encountered by contractors when handling multiple construction projects in terms of:
   a. Resource Allocation;
   b. Prioritization and Time Management;
   c. Communication and Collaboration; and,
   d. Scope and Scope Creep?

2. What management strategies do contractors use to solve the problems they have encountered when handling multiple construction projects?

3. What other management solutions can be recommended to avoid these problems when working on multiple construction projects?

4. What action plan can be proposed for the application of management strategies when handling multiple construction projects?

METHODS

Research Design. This study employed a mixed-methods research design to provide a comprehensive understanding of the topic. The quantitative component examined respondents' feedback on challenges and management strategies in handling multiple construction projects, while the qualitative component captured their recommendations for additional management strategies. Together, these approaches offered both measurable insights and contextual depth, forming a balanced foundation for the study's research questions.

Population and Sampling. A total of 50 respondents, consisting of contractors, project managers, and engineers based in Laguna, were selected to answer the prepared survey questionnaire, which included both closed- and open-ended questions. The target respondents had direct involvement in handling multiple projects, had professional experience in construction planning, coordination, and execution, and have sufficient exposure to provide informed responses regarding project management challenges and strategies.

Instrumentation. The study utilized a survey questionnaire with specific statements and open-ended questions. The instruments consisted of three parts. The preliminary part of the study collected demographic information from the respondents. The first part of the instruments consisted of the common problems encountered when handling multiple construction projects. The second part of the questionnaire inquired about the management solutions used to address these problems. The prepared instrument was distributed and answered subjectively by the respondents.

Data Gathering Procedure. The researcher used the generation method of process by conducting a survey questionnaire distribution, first-hand observation, and participant observation, which certainly fit the form of quantitative and qualitative data gathering. Using the generation method helped the researcher develop a deeper understanding and find innovative solutions to the said problems.

Ethical Considerations. The researcher upheld rigorous ethical standards throughout the study to ensure integrity and respect for participants. Respondents were fully informed of the research purpose and provided consent prior to data collection. Their views and experiences were treated with respect, and confidentiality was strictly maintained to safeguard privacy. Care was taken to ensure participants felt secure in sharing their perspectives, with data handled accurately, stored privately, and used solely for academic purposes. Findings were acknowledged to respondents, and disclosure of information that could potentially cause harm was conscientiously avoided.

Data Analysis. The weighted mean was used to measure common problems and the application

of management strategies. It is a statistical measure that accounts for the relative importance of data points by assigning weights. Each value is multiplied by its weight, the products are summed, and the total is divided by the sum of the weights to produce an average that reflects varying significance. On the other hand, the qualitative data on recommended management solutions were analyzed using thematic analysis, a method that identifies recurring patterns and categories within textual responses. Codes were systematically assigned to participants' insights, which were then clustered into broader themes such as delegation and leadership, resource optimization, communication, and risk management. This process allowed the researcher to distill complex narratives into coherent strategies, ensuring that the findings reflected both the diversity of perspectives and the underlying commonalities across respondents' experiences.

RESULTS

Common problems encountered by contractors when handling multiple construction projects. Table 1 shows the frequency of problems encountered by contractors when handling multiple projects. The table presented a summary of common problems encountered by contractors when handling multiple construction projects, along with their mean scores and standard deviations, which help gauge the frequency/variability of these issues.

Contractors managing multiple construction projects face recurring challenges in resource allocation, time management, communication, and scope control. Resource issues often arise from limited availability of specialized skills and equipment, with current systems tending to react rather than anticipate problems. Khattak and Qureshi (2017) note that only 17% of contractors recognize the importance of project management, while Roshdi et al. (2022) highlight barriers within the "5M" framework—money, machinery, manpower, materials, and methods and Zerjav (2015) shows how resource constraints affect stakeholder coordination.

Table 1

Common Problems Encountered by Contractors When Handling Multiple Construction Projects

Problems Encountered	Mean	SD	Interpretation
Resource Allocation			
1. Insufficient resources leading to project delays or compromised quality.	2.14	0.86	Rarely Encountered
2. Overallocation of resources resulting in burnout or decreased productivity.	2.12	0.59	Rarely Encountered
3. Lack of clear roles and responsibilities, causing confusion and conflicts.	2.36	0.92	Rarely Encountered
4. Inadequate availability of specialized skills or expertise for certain projects.	3.62	1.07	Frequently Encountered
5. Difficulty in obtaining necessary equipment or materials, hindering project progress.	3.34	0.94	Sometimes Encountered
Overall Mean	**2.72**	**0.59**	**Sometimes Encountered**
Prioritization and Time Management			
6. Conflicting project deadlines and difficulty in determining priority order.	2.52	0.89	Rarely Encountered
7. Inaccurate estimation of project timelines, leading to missed deadlines.	3.40	0.83	Sometimes Encountered
8. Ineffective delegation of tasks, resulting in bottlenecks and delays.	2.58	0.97	Rarely Encountered
9. Lack of visibility in resource availability, making it challenging to allocate time effectively.	2.66	0.87	Sometimes Encountered
10. Inability to adapt to unexpected changes, causing disruptions in project schedules.	2.62	1.01	Sometimes Encountered
Overall Mean	**2.76**	**0.71**	**Sometimes Encountered**
Communication and Collaboration			
11. Inadequate information sharing and lack of transparency between project teams.	3.20	0.76	Sometimes Encountered
12. Miscommunication or misunderstandings leading to errors or rework.	3.46	1.03	Frequently Encountered
13. Language or cultural barriers hampering effective collaboration.	3.62	1.34	Frequently Encountered
14. Lack of clear channels for feedback or escalation of issues.	2.42	0.88	Rarely Encountered
15. Inefficient coordination between stakeholders, causing delays in decision-making.	2.56	0.93	Rarely Encountered
Overall Mean	**3.05**	**0.73**	**Sometimes Encountered**
Scope and Scope Creep			
16. Poorly defined project objectives and requirements, leading to scope ambiguity.	2.38	0.78	Rarely Encountered
17. Frequent changes in project scope without proper evaluation or control.	3.72	1.34	Frequently Encountered
18. Failure to manage stakeholder expectations and demands effectively.	2.60	0.93	Rarely Encountered
19. Inability to identify and address scope creep promptly, resulting in increased project complexity.	2.42	0.88	Rarely Encountered
20. Lack of a change management process to handle scope modifications and their impacts.	2.60	0.90	Rarely Encountered
Overall Mean	**2.74**	**0.63**	**Sometimes Encountered**
Common Problems Encountered Overall Mean	**2.82**	**0.59**	**Sometimes Encountered**

Time management difficulties include inaccurate activity duration estimates and limited visibility of resource allocation, with Arefazar et al. (2022) recommending Agile strategies, Aziz and Abdel-Hakam (2016) pointing to poor estimation and misalignment,

and Mahpour (2018) stressing weak stakeholder integration. Communication challenges persist due to miscommunication and cultural barriers; Liu et al. (2017) emphasize BIM's potential to enhance collaboration, though Ghaffarianhoseini et al. (2017) note software complexity and resistance to change limit effectiveness, while Aziz and Abdel-Hakam (2016) identify contractor-consultant gaps. Scope creep remains problematic, with Ajmal et al. (2022) linking it to task complexity and unclear specifications, Teye Amoatey and Anson (2017) citing client-driven changes, and Kermanshachi et al. (2017) highlighting inconsistencies in scope development. Collectively, these studies suggest contractors would benefit from proactive planning, structured resource allocation, stronger communication systems, and disciplined change management to reduce delays, cost overruns, and inefficiencies.

Management strategies used by contractors to solve problems when handling multiple construction projects. Table 2 presented the various management strategies contractors employ to address challenges associated with handling multiple construction projects.

The most highly applied management strategy, with a mean score of 4.64, is monitoring project progress using KPIs and metrics, indicating Very High Application among contractors. KPIs enable contractors to track progress, detect issues early, and make timely adjustments, supporting the importance of monitoring and data-driven decision-making highlighted by Olawale and Sun (2015) and the role of real-time ICT-enabled monitoring emphasized by Martínez-Rojas et al. (2016). Another strategy with Very High Application is setting clear project objectives, milestones, and deadlines (mean = 4.54), reflecting the importance of structured planning, consistent with Monghasemi et al. (2015). Other widely applied strategies include conducting resource assessments, providing project management training, establishing centralized PMOs (mean = 4.44), and prioritizing projects based on strategic alignment and resource availability (mean = 4.52), which support coordination and efficient resource use, as noted by Yiu et al. (2019) and Ahn et al. (2016).

Table 2

Management Strategies Used by Contractors to Solve Problems When Handling Multiple Construction Projects

Management Strategies	Mean	Std. Deviation	Interpretation
1. Establish a centralized project management office (PMO) to provide oversight and coordination across projects.	4.36	0.72	Very High Application
2. Conduct a comprehensive resource assessment to ensure sufficient resources are allocated to each project.	4.44	0.64	Very High Application
3. Prioritize projects based on strategic alignment, urgency, and resource availability.	4.52	0.71	Very High Application
4. Implement project management software or tools to enhance visibility, collaboration, and resource allocation.	4.28	0.76	Very High Application
5. Foster a culture of effective communication and ensure regular project status updates across teams.	4.32	0.79	Very High Application
6. Set clear and realistic project objectives, milestones, and deadlines.	4.54	0.61	Very High Application
7. Implement a change control process to manage scope changes and minimize scope creep.	3.60	0.76	High Application
8. Encourage cross-functional collaboration and knowledge sharing among project teams.	3.94	0.47	High Application
9. Provide training and development opportunities to enhance project management skills.	4.46	0.81	Very High Application
10. Monitor project progress and performance using key performance indicators (KPIs) and metrics.	4.64	0.60	Very High Application
Overall Mean	**4.28**	**0.53**	**Very High Application**

Additionally, implementing project management software and promoting effective communication (mean = 4.32–4.28) improve collaboration and transparency, consistent with Martínez-Rojas et al. (2016) and Ahn et al. (2016). Strategies such as implementing change control processes (mean = 3.60) and encouraging cross-functional collaboration (mean = 3.94) show High Application, though organizational and cultural barriers remain (Yiu et al., 2019). Overall, the strategies yielded a mean score of 4.28, indicating that contractors widely apply structured monitoring, planning, resource management, communication, and technology to manage multiple construction projects effectively.

Other recommended management solutions when handling multiple construction projects. Various themes were generated for managing multiple construction projects emphasizing

strict implementation of management practices, particularly delegation and leadership, with contractors noting the importance of knowing when to take charge and when to entrust responsibilities (Contractor 1). Strong relationships, clear accountability, and realistic project acceptance were highlighted to improve collaboration and prevent overextension (Contractor 42, Contractor 30). Project prioritization was frequently mentioned, with systems evaluating deadlines, complexity, location, manpower, and resources to ensure critical projects receive attention (Contractor 3, Contractor 39), supported by allocating additional manpower to high-priority tasks (Contractor 40). Resource management recommendations included providing adequate manpower, equipment, tools, permits, and utilities while balancing allocation for seasonal fluctuations (Contractor 6, Contractor 24, Contractor 47). Communication and continuous improvement were also stressed, with structured communication plans, regular progress reviews, and maintaining contact with regulatory authorities to expedite approvals (Contractor 8, Contractor 25, Contractor 22). Assigning managers based on expertise (Contractor 14, Contractor 48), collecting feedback, and establishing KPIs (Contractor 26, Contractor 28) were seen as vital. Other strategies included fostering collaboration and knowledge sharing (Contractor 9, Contractor 29), proactive risk management (Contractor 50, Contractor 43), standardized processes and modular construction (Contractor 32, Contractor 36), centralized procurement and subcontractor reviews (Contractor 38, Contractor 45), and contingency planning with backup resources (Contractor 18).

Proposed action plan for the application of management strategies when handling multiple construction projects. Table 3 presents the proposed action plan for managing multiple construction projects, developed from the study's findings on common challenges and applied solutions. The plan aims to improve efficiency by addressing recurring issues in resource allocation, scheduling, communication, and scope control.

Table 3

Proposed Action Plan for Contractors in Handling Multiple Construction Projects

Objectives	Proposed Management Strategies	Expected Outcome
Resource Allocation		
1. Enhance communication and collaboration among project teams.	1. Conduct a comprehensive resource assessment before project initiation (manpower, equipment, materials). 2. Allocate resources based on project priority, complexity, and capacity to avoid overloading personnel or equipment. 3. Regularly review resource utilization to address shortages or gaps.	Ensure sufficient resources for each project and prevent delays.
2. Mitigate issues in resource allocation, prioritization, communication, and scope management.	1. Provide continuous training for project managers and technical staff on project management, safety, and construction best practices. 2. Encourage professional development, certifications, and skill enhancement. 3. Conduct regular performance evaluations to identify training needs.	Improved project management skills and operational efficiency.
3. Strengthen logistics and supply chain management.	1. Develop a logistics and supply management plan for each project. 2. Coordinate procurement, delivery schedules, and inventory. 3. Monitor supplier performance and material usage.	Reduced delays, efficient material handling, and cost-effective procurement.
Prioritization & Time Management		
1. Improve efficiency in handling multiple projects.	1. Establish standardized project management procedures across projects. 2. Monitor performance using KPIs (schedule, cost variance, quality, safety). 3. Conduct regular coordination meetings to review progress and address issues.	Improved monitoring, early risk identification, and better project control.
2. Ensure timely completion while maintaining quality and safety.	1. Define and approve project objectives, scope, milestones, and timelines before mobilization. 2. Develop detailed schedules and work programs. 3. Implement Quality and Safety Management Plans. 4. Continuously monitor KPIs for schedule adherence.	Clear project direction, improved progress tracking, and goal alignment.
3. Establish a systematic project prioritization system.	1. Prioritize projects based on strategic importance, urgency, risk, and resource availability. 2. Regularly review project priorities to ensure alignment with organizational goals.	Optimized resource allocation and alignment with organizational objectives.
4. Strengthen leadership and delegation skills of project managers.	1. Grant project managers authority to delegate tasks and decisions. 2. Provide leadership and delegation training. 3. Promote accountability, trust, and teamwork.	Better workload distribution, teamwork, and efficient execution.
Communication & Collaboration		
1. Establish a PMO.	1. Create a PMO to oversee and coordinate construction projects. 2. Define clear roles, responsibilities, and authority. 3. Implement standardized templates and reporting systems.	Better coordination, standardized processes.
2. Integrate project management software and tools.	1. Use appropriate software for project planning, monitoring, and reporting. 2. Train project teams in system usage. 3. Utilize shared dashboards for real-time monitoring of schedule, cost, and resources.	Enhanced visibility, collaboration, and resource allocation.
3. Promote open communication across stakeholders.	1. Conduct regular coordination meetings. 2. Establish formal communication channels and reporting structures. 3. Encourage transparent communication to avoid delays and misunderstandings.	Improved transparency and informed stakeholders.
4. Encourage collaboration and knowledge sharing.	1. Promote collaboration among project teams. 2. Encourage knowledge sharing and learning from experience. 3. Support cross-functional teamwork to enhance problem-solving.	Enhanced teamwork and knowledge sharing.
Scope & Scope Creep		
1. Implement a formal change control process.	1. Establish a structured change control system for all projects. 2. Record, evaluate, and approve scope changes before implementation. 3. Update project plans and communicate approved changes to stakeholders.	Reduced scope creep and better scope control.

By implementing the recommended strategies, solutions, and mitigation measures, contractors can enhance project delivery while meeting quality, safety, and timeline goals. Regular reviews and adjustments tailored to project-specific requirements are essential, and the plan is structured around key sections: objectives, management strategies, persons involved, budgetary requirements, time, and expected outcomes.

DISCUSSION

Contractors managing multiple construction projects face recurring challenges in four areas: resource allocation, prioritization and time management, communication and collaboration, and scope control. Resource issues include shortages of specialized skills and materials, overallocation, and unclear roles, with Khattak and Qureshi (2017) noting weak resource planning, Roshdi et al. (2022) highlighting barriers in the "5M" framework, and Zerjav (2015) linking constraints to poor coordination. Time management problems stem from inaccurate estimates and limited visibility, with Arefazar et al. (2022) recommending Agile strategies, Aziz and Abdel-Hakam (2016) citing poor estimation and misalignment, and Mahpour (2018) stressing weak stakeholder integration. Communication challenges involve miscommunication, cultural barriers, and ineffective systems; Liu et al. (2017) emphasize BIM's potential, though Ghaffarianhoseini et al. (2017) note software and resistance issues, while Aziz and Abdel-Hakam (2016) identify contractor-consultant gaps. Scope creep arises from unclear specifications, client-driven changes, and inconsistent processes, as noted by Ajmal et al. (2022), Teye Amoatey and Anson (2017), and Kermanshachi et al. (2017). To address these, contractors apply strategies with Very High Application, including KPIs, clear objectives, resource assessments, centralized PMOs, project prioritization, management software, and effective communication, alongside High Application strategies such as change control and cross-functional collaboration, supported by leadership, risk management, standardization, modular construction, procurement systems, and contingency planning.

Overall, the findings indicate that while contractors encounter several challenges when managing multiple construction projects, they actively implement a variety of strategies to address these complexities. Effective leadership, structured project prioritization, efficient resource management, and strong communication systems play critical roles in maintaining project coordination and performance. However, scope management remains comparatively weaker than other management areas, suggesting that scope creep continues to be difficult to control due to changing project requirements, inadequate change management processes, and the complexity of coordinating multiple stakeholders across projects. These results highlight the importance of strengthening proactive planning, structured decision-making, and integrated management practices to enhance contractors' ability to handle multiple projects simultaneously.

Based on these findings, it is recommended that contractors adopt more proactive approaches to resource allocation by regularly assessing project resource requirements and developing contingency plans to address potential shortages of specialized skills or materials. Contractors should also continue strengthening existing management strategies, including the use of KPIs, clear project objectives, centralized PMOs, and project management software, to improve monitoring, coordination, and decision-making. Furthermore, leadership development programs focusing on delegation, conflict resolution, and strategic decision-making should be prioritized to enhance project management capabilities. Encouraging continuous improvement through stakeholder feedback, standardized processes, and collaborative practices can further strengthen project outcomes. Finally, contractors are encouraged to implement the proposed action plan, which emphasizes improving project management efficiency, leadership development, communication, and resource

allocation, as well as investing in training and technological tools to enhance visibility, reduce scope creep, and improve the overall effectiveness of managing multiple construction projects.

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