

Research Article**APPLYING PROJECT MANAGEMENT PRINCIPLES TO ENHANCE ORGANIZATIONAL EFFICIENCY AND EFFECTIVENESS IN THE CONSTRUCTION INDUSTRY IN ASABA, DELTA STATE, NIGERIA*****Ajaelu C. Henry, Nwachukwu Ugochukwu and Obru-Egboro O. Francis**

Department of Quantity Surveying, Enugu State University of Science and Technology, ESUT Enugu, Nigeria

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Abstract

This study investigated the application of project management principles to enhance organizational efficiency and effectiveness in the construction industry in Asaba, Delta State, Nigeria. The primary objectives were to assess the impact of project management tools on project delivery timelines, evaluate the influence of project management training on cost management, and examine the relationship between stakeholder communication and project success. Utilizing a descriptive survey design, data was collected through structured questionnaires administered to 95 construction professionals in Asaba. The findings revealed that project management tools significantly improve task organization, communication, risk mitigation, and adherence to timelines. Project management training enhances cost estimation, budget accuracy, and cost control, positively impacting cost management practices. Effective stakeholder communication is crucial for project success, fostering collaboration, trust, and risk minimization. The study concluded that the strategic application of project management tools, comprehensive training, and robust communication strategies are essential for achieving efficient and effective project outcomes in the construction industry. These insights offer valuable guidance for construction organizations aiming to improve their project performance and overall organizational success.

Keywords: Project Management, Efficiency, Cost Management, Stakeholder Communication, Construction Industry.

INTRODUCTION

The construction industry supports global economic growth but faces challenges like cost overruns, delays, poor quality, and safety concerns, which impact both projects and communities. Addressing these issues requires the effective application of project management principles. Construction projects are complex and site-specific, involving numerous stakeholders and resources, making it difficult to meet deadlines and budgets (Banerjee, Putta, and Rao, 2021). External factors like weather and regulations further complicate management efforts. Pinto (2020) highlights that project management provides an organized approach to achieving project goals, yet many companies struggle with its application. A key issue is the gap between project management theory and practice. Abbasi *et al.* (2020) note that despite extensive literature, practical application remains challenging due to constraints like organizational culture and resource limitations (Armenia *et al.*, 2019). As a result, projects often face inefficiencies, cost overruns, and delays. The focus on project management in construction is increasing, with evidence showing that it improves performance and efficiency (Pace, 2019). Relevant domains include risk, quality, cost, and time management (Fewings and Henjewe, 2019). Technological advancements like Building Information Modelling (BIM) are also transforming project management practices (Georgiadou, 2019). The study aims to explore how project management principles can enhance organizational efficiency in construction, providing insights into better practices and supporting improved project outcomes.

***Corresponding Author: Ajaelu C. Henry,**

Department of Quantity Surveying, Enugu State University of Science and Technology, ESUT Enugu, Nigeria.

LITERATURE REVIEW**Conceptual Review****Overview of project management principles**

Project management is crucial for systematically applying knowledge, skills, and techniques to meet project requirements. It ensures projects achieve objectives within time, cost, and quality constraints (Armenia *et al.*, 2019). The Project Management Institute (PMI) outlines core principles in the Project Management Body of Knowledge (PMBOK), including integration, scope, time, cost, quality, human resources, communication, risk, procurement, and stakeholder management (Takagi & Varajão, 2020; Singh & Williams, 2020). Methodologies like Agile and PRINCE2 offer flexible and structured approaches, respectively (Raharjo & Purwandari, 2020; Timinger, Schmidtner & Reiche, 2021). Effective project management fosters structure, communication, and resource efficiency across various industries.

Project management in the construction industry

The construction sector's complexity, with unique site conditions and numerous stakeholders, requires robust project management to ensure timely, budget-compliant, and quality outcomes (Kim, Kim & Cho, 2020). Challenges include unpredictability from external factors and inefficiencies in time and cost management, often exacerbated by poor planning and risk management (Hillson & Simon, 2020; João *et al.*, 2020). Tools like the Critical Path Method (CPM) and Gantt charts aid in scheduling and resource allocation (Kusumadarm *et al.*,

2020). Effective cost and quality management, including value engineering and thorough quality checks, are vital (Olafsdottir, 2019). Human resource and communication management are crucial for maintaining team coordination and project success (Pace, 2019; Derakhshan, Turner & Mancini, 2019).

Impact of project management tools on project delivery

Project management tools such as Gantt charts and project management software (e.g., Microsoft Project, Primavera P6) are essential for planning, scheduling, and monitoring construction projects (Ramachandran & Karthick, 2019; Cazares, 2024). Earned Value Management (EVM) helps measure project performance by comparing planned versus actual progress (Nizam & Elshannaway, 2019). Challenges include insufficient training, resistance to change, and interoperability issues among tools (Choi *et al.*, 2020; Cazares, 2024). Addressing these challenges through training and a culture of innovation can enhance the effectiveness of project management tools.

Theoretical Framework

Stakeholder Theory

Stakeholder theory, proposed by Freeman (1984), asserts that organizations should consider all stakeholders, not just shareholders, in their decisions (Kivits, 2021). This theory is vital in the construction industry, where diverse stakeholders including clients, contractors, suppliers, regulatory bodies, and local communities—impact project outcomes. Managing these relationships effectively is crucial for project success. For instance, understanding client expectations helps align project management practices with their needs, while strong relationships with contractors and suppliers enhance collaboration and mitigate risks. Additionally, engaging with regulatory bodies and local communities ensures compliance and reduces conflicts. Incorporating sustainability principles addresses environmental and social concerns, improving organizational reputation and contributing to sustainable development.

Lean Construction Theory

Lean Construction Theory, influenced by lean manufacturing principles, was introduced by Ballard, Howell, and Koskela (Koskela, 2020). It focuses on maximizing value and minimizing waste in construction, emphasizing continuous improvement, collaboration, and efficient resource use. Lean principles help streamline processes, reduce waste, and improve project performance. Techniques like Value Stream Mapping identify inefficiencies and streamline workflows. Collaboration among stakeholders fosters better decision-making and project coordination. Lean Construction Theory aids in enhancing organizational efficiency by optimizing project processes and delivering higher value to clients.

Empirical Review

Franz and Roberts (2022) highlighted that removing communication barriers and developing a relational project culture are crucial for project success. Effective communication and strong team relationships foster collaboration and innovation, while understanding client needs ensures alignment with project goals. Akinradewo *et al.* (2022)

explored the impact of project planning on time and cost overruns using data from public projects in Lagos State, Nigeria. They found a significant relationship between time and cost overruns and identified a non-linear relationship between planning techniques and project outcomes, emphasizing the need for effective planning. Henkel, Marion, and Bourdeau (2019) examined leadership behavior in project management, distinguishing between task-oriented and relationship-oriented styles. Understanding these leadership styles can improve project management effectiveness. Derakhshan, Turner, and Mancini (2019) reviewed project governance literature, revealing three contexts success, megaprojects, and ethics that influence stakeholder interactions. Their framework highlights how strategic decisions affect stakeholder management at both organizational and project levels.

METHODOLOGY

This study utilizes a descriptive survey research design, appropriate for capturing comprehensive data on project management principles in the construction industry. The design allows for systematic collection of quantitative data from a wide range of construction professionals, facilitating an assessment of the adoption, benefits, and challenges of project management techniques, including scheduling, cost control, risk management, and stakeholder engagement.

Study Area

The research is conducted in Asaba, Delta State, Nigeria, a key hub for construction activities in the Niger Delta region. Asaba's dynamic construction sector, encompassing residential, commercial, infrastructure, and public works projects, provides a varied context for examining project management practices and their impact on efficiency and effectiveness.

Population and Sampling

The study targets Donsprojex Nigeria Ltd, a construction service company in Asaba known for its architectural designs, project cost appraisals, and project management services. The population consists of 105 staff members, and the census sampling method is employed, meaning all staff members are included in the study.

Data Collection

Data is collected using a structured questionnaire designed to gather insights into the impact of project management tools on delivery timelines, the influence of project management training on cost management, and the role of stakeholder communication in project success. The student-researcher distributed 105 questionnaires, with 95 completed forms retrieved for analysis.

Data Analysis

Descriptive statistics, including mean and standard deviation, are used to analyze the data. This approach helps in summarizing and interpreting the collected data to draw conclusions about the effectiveness and challenges of project management practices in the construction industry.

RESULTS

The data presented in Table 1 provides an overview of the perceived impact of project management tools on project delivery timelines, based on the responses from the survey participants. The first item indicates unanimous consensus among respondents, with a mean score of 5.00 and a standard deviation of 0.00, signifying that all participants strongly agree that project management tools, such as Gantt charts and scheduling software, are highly effective in planning and organizing project tasks. The second item, with a mean score of 3.80 and a standard deviation of 1.37, shows that respondents generally agree that project management tools improve communication among project stakeholders. The relatively higher standard deviation suggests some variability in responses, indicating that while many see clear benefits, there may be differing levels of perceived effectiveness depending on individual experiences or specific project contexts. The third item, which explores the role of project management tools in identifying and mitigating potential project risks, has a mean score of 4.57 and a standard deviation of 0.63. The high mean and relatively low standard deviation indicate strong agreement among participants, highlighting that these tools are seen as valuable assets in risk management processes within projects. The fourth item, with a mean score of 4.77 and a standard deviation of 0.42, suggests that respondents strongly agree that implementing project management tools enhances project coordination and collaboration. This low standard deviation points to a high level of consensus, emphasizing the effectiveness of these tools in fostering teamwork and cooperative project environments. Finally, the fifth item, which assesses the contribution of project management tools to adhering to project timelines and deadlines, has a mean score of 4.86 and a standard deviation of 0.35.

This indicates strong agreement among respondents that these tools are critical in ensuring projects stay on schedule, further reinforcing their essential role in project delivery success. The data presented in Table 2 provides detailed insights into how project management training influences project cost management, based on the survey responses. The first item indicates unanimous consensus among respondents, with a mean score of 5.00 and a standard deviation of 0.00. This signifies that all participants strongly agree that project management training enhances their understanding of cost estimation techniques. The second item also shows a unanimous strong agreement, with a mean score of 5.00 and a standard deviation of 0.00. Respondents believe that training in project management significantly improves their ability to develop accurate project budgets. This reinforces the importance of structured training programs in enhancing budgeting skills within project management. The third item, which assesses whether project management training equips individuals with the skills needed to control project costs effectively, has a mean score of 5.00 and a slightly higher standard deviation of 0.39. Despite this minor variability, the overwhelming consensus still strongly supports the positive impact of training on cost control skills, emphasizing its critical role in effective cost management. The fourth item, with a mean score of 4.56 and a standard deviation of 0.61, suggests strong agreement among respondents that project management training positively impacts cost management practices in their projects. While there is a slightly higher variability in responses compared to the first three items, the overall strong agreement underscores the perceived benefits of training on practical cost management applications. The fifth item, which explores respondents' confidence in managing project finances and expenditures post-training, has a mean score of 4.48 and a standard deviation of 0.60.

Table 1. Summary of descriptive statistics on the impact of project management tools on project delivery timelines

| S/N | Question | SA | A | U | D | SD | T | MN | STD | LA |
|-----|--|----|----|---|----|----|----|------|------|----|
| 1 | Project management tools, such as Gantt charts and scheduling software, effectively help in planning and organizing project tasks. | 95 | 0 | 0 | 0 | 0 | 95 | 5.00 | 0.00 | SA |
| 2 | The use of project management tools improves communication among project stakeholders. | 43 | 26 | 5 | 12 | 9 | 95 | 3.80 | 1.37 | A |
| 3 | Project management tools assist in identifying and mitigating potential project risks. | 61 | 27 | 7 | 0 | 0 | 95 | 4.57 | 0.63 | SA |
| 4 | Implementing project management tools enhances project coordination and collaboration. | 73 | 22 | 0 | 0 | 0 | 95 | 4.77 | 0.42 | SA |
| 5 | Project management tools contribute to adhering to project timelines and deadlines. | 82 | 13 | 0 | 0 | 0 | 95 | 4.86 | 0.35 | SA |

Key: SA =Strongly Agree, A = Agree, U = undecided, SD = Standard deviation, T = Total, MN = Mean, STD = Standard Deviation, LA = Level of Agreement.

Table 2. Summary of descriptive statistics on how project management training influence project cost management

| S/N | Question | SA | A | U | D | SD | T | MN | STD | LA |
|-----|---|----|----|---|---|----|----|------|------|----|
| 1 | Project management training enhances my understanding of cost estimation techniques. | 95 | 0 | 0 | 0 | 0 | 95 | 5.00 | 0.00 | SA |
| 2 | Training in project management improves my ability to develop accurate project budgets. | 95 | 0 | 0 | 0 | 0 | 95 | 5.00 | 0.00 | SA |
| 3 | Project management training equips me with the skills needed to control project costs effectively | 78 | 17 | 0 | 0 | 0 | 95 | 5.00 | 0.39 | SA |
| 4 | I believe that project management training positively impacts cost management practices in my projects. | 59 | 30 | 6 | 0 | 0 | 95 | 4.56 | 0.61 | SA |
| 5 | Through project management training, I feel more confident in managing project finances and expenditures. | 51 | 39 | 5 | 0 | 0 | 95 | 4.48 | 0.60 | A |

Table 3. Summary of descriptive statistics on the relationship between stakeholder communication and project success

| S/N | Question | SA | A | U | D | SD | T | MN | ST | LA |
|-----|---|----|----|---|---|----|----|------|------|----|
| 1 | Effective communication with stakeholders positively impacts project outcomes. | 95 | 0 | 0 | 0 | 0 | 95 | 5.00 | 0.00 | SA |
| 2 | Regular and clear communication with stakeholders enhances project team collaboration and cohesion. | 47 | 43 | 5 | 0 | 0 | 95 | 4.44 | 0.60 | A |
| 3 | Open and transparent communication fosters trust and credibility with project stakeholders. | 51 | 34 | 0 | 9 | 1 | 95 | 4.32 | 0.96 | A |
| 4 | Timely and accurate communication with stakeholders minimizes project risks and uncertainties. | 95 | 0 | 0 | 0 | 0 | 95 | 5.00 | 0.00 | SA |
| 5 | Projects with robust stakeholder communication strategies are more likely to achieve their objectives and deliverables. | 63 | 32 | 0 | 0 | 0 | 95 | 4.66 | 0.48 | SA |

This result indicates a strong agreement, though with a bit more variability, suggesting that while most participants feel more confident after training, there might be differences in individual confidence levels or training experiences. The data presented in Table 3 provides analysis of the relationship between stakeholder communication and project success, based on responses from the survey participants. The first item indicates unanimous consensus among respondents, with a mean score of 5.00 and a standard deviation of 0.00. This signifies that all participants strongly agree that effective communication with stakeholders positively impacts project outcomes. The second item, with a mean score of 4.44 and a standard deviation of 0.60, shows that respondents generally agree that regular and clear communication enhances project team collaboration and cohesion. The moderate standard deviation suggests some variability in responses, indicating that while the majority see clear benefits, there might be differences in the extent to which individuals experience improved team dynamics due to communication practices. The third item, which explores the role of open and transparent communication in fostering trust and credibility with stakeholders, has a mean score of 4.32 and a standard deviation of 0.96. This result indicates strong agreement, but with notable variability, suggesting that while many respondents recognize the value of transparency, there might be challenges or differing perceptions regarding its impact on trust and credibility. The fourth item again shows unanimous strong agreement, with a mean score of 5.00 and a standard deviation of 0.00, indicating that all participants strongly agree that timely and accurate communication minimizes project risks and uncertainties. The fifth item, with a mean score of 4.66 and a standard deviation of 0.48, indicates strong agreement that projects with robust stakeholder communication strategies are more likely to achieve their objectives and deliverables. The low standard deviation suggests a high level of consensus, reinforcing the idea that effective communication strategies are crucial for project success.

FINDINGS AND DISCUSSION

The findings of the study offer significant insights into the impact of project management tools, training, and stakeholder communication on project success within the construction industry in Asaba, Delta State, Nigeria. These findings align with and expand upon existing literature, underscoring the importance of these elements in enhancing project delivery, cost management, and overall project outcomes.

Impact of project management tools on project delivery timelines

- i. Effectiveness of Project Management Tools: Respondents overwhelmingly agree that project management tools, such as Gantt charts and scheduling software, are effective in planning and organizing project tasks. This supports Henkel, Marion, and Bourdeau (2019), who highlighted that such tools facilitate task organization and contribute to overall project efficiency. The structured approach offered by these tools ensures tasks are well-planned and organized, leading to timely project completion.
- ii. Improvement in Communication: Project management tools are perceived to enhance communication among stakeholders, although responses vary based on individual experiences. This finding is consistent with Franz and Roberts (2022), who identified communication as a critical

success factor. Effective communication through these tools reduces misunderstandings and delays, aligning stakeholders and ensuring project alignment.

- iii. Risk Identification and Mitigation: There is a strong consensus that project management tools help identify and mitigate potential risks, supporting Akinradewo *et al.* (2022), who linked project planning to successful project delivery. These tools' ability to foresee and address risks before they escalate is essential for maintaining project schedules and preventing delays.
- iv. Coordination and Collaboration: Project management tools are recognized for enhancing project coordination and collaboration, which is crucial for seamless task execution. This finding aligns with Franz and Roberts (2022), who emphasized the role of effective coordination in smooth project execution.
- v. Adherence to Timelines and Deadlines: There is unanimous agreement that project management tools significantly contribute to meeting project deadlines, reinforcing Henkel, Marion, and Bourdeau (2019). The structured timelines and tracking mechanisms ensure milestones are met and deadlines are respected.

Influence of project management training on cost management

Enhancement of Cost Estimation Techniques: Respondents agree that project management training improves understanding of cost estimation techniques. This aligns with Derakhshan, Turner, and Mancini (2019), who noted that training enhances cost estimation and management capabilities. Training equips project managers with skills for accurate budgeting and financial planning.

- i. Development of Accurate Budgets: There is a consensus that training aids in developing accurate project budgets, consistent with Akinradewo *et al.* (2022). Training programs provide project managers with tools to create realistic budgets, essential for controlling project costs.
- ii. Cost Control Skills: The study finds strong agreement that training equips project managers with skills for effective cost control. This supports Henkel, Marion, and Bourdeau (2019), who highlighted the importance of training for cost management. Effective cost control is crucial for monitoring expenditures and preventing overruns.
- iii. Positive Impact on Cost Management Practices: Respondents believe that training positively impacts cost management practices, resonating with Franz and Roberts (2022). Training enhances project managers' ability to communicate budgetary requirements, foster collaboration, and manage finances confidently.

Role of stakeholder communication in project success

- i. Positive Impact on Project Outcomes: There is unanimous agreement that effective communication with stakeholders positively impacts project outcomes. This finding aligns with Henkel, Marion, and Bourdeau (2019), who emphasized communication as a key leadership behavior contributing to project success.
- ii. Enhancement of Team Collaboration and Cohesion: Regular and clear communication is seen as enhancing team collaboration and cohesion, consistent with Franz and Roberts (2022). Effective communication fosters a collaborative environment and ensures that team members work harmoniously.

- iii. Building Trust and Credibility: Open and transparent communication is recognized for building trust and credibility with stakeholders, supporting Derakhshan, Turner, and Mancini (2019). Trust and credibility are crucial for gaining stakeholder support and reducing resistance.
- iv. Minimizing Risks and Uncertainties: Strong agreement exists that timely and accurate communication minimizes project risks and uncertainties. This aligns with Akinradewo *et al.* (2022), who stressed the role of clear communication in risk management. Timely updates on potential risks enable proactive mitigation strategies.
- v. Achieving Project Objectives: Projects with robust communication strategies are more likely to achieve their objectives and deliverables, resonating with Franz and Roberts (2022). Effective communication ensures stakeholders are aligned with project goals and progress.

The study's findings reinforce the importance of project management tools, training, and stakeholder communication in the construction industry. The effectiveness of these elements in improving project delivery timelines, cost management, and stakeholder engagement is well-supported by existing literature and the study's results. Enhanced communication, accurate cost estimation, and effective use of project management tools contribute significantly to successful project outcomes, highlighting their indispensable role in the construction industry.

Conclusion

This study investigated how project management principles can be applied to improve organizational efficiency and effectiveness within the construction industry in Asaba, Delta State, Nigeria. It focused on the impact of project management tools, training, and stakeholder communication on project delivery timelines, cost management, and overall project success. The study revealed that project management tools, including Gantt charts and scheduling software, are crucial for enhancing project delivery timelines. These tools are effective in planning, organizing tasks, improving stakeholder communication, identifying and mitigating risks, and facilitating project coordination and collaboration. Their use contributes significantly to adhering to project timelines and deadlines, ultimately ensuring successful project completion. Training in project management plays a vital role in improving cost management. It enhances project managers' understanding of cost estimation techniques, the ability to develop accurate budgets, and effective cost control measures. The training not only boosts confidence in managing project finances but also leads to better financial decision-making and overall project outcomes. Effective communication with stakeholders is fundamental to project success. The study highlights that clear, regular, and transparent communication enhances team collaboration and cohesion. It fosters trust and credibility with stakeholders, reduces risks and uncertainties, and ensures that projects meet their objectives and deliverables. Robust communication strategies are crucial for aligning stakeholders with project goals and facilitating successful project delivery. The findings emphasize the importance of integrating project management principles to boost organizational efficiency and effectiveness in the construction industry. The effective use of project management tools, comprehensive training programs, and strong stakeholder communication strategies are essential for improving project performance, managing costs effectively, and achieving project success. By adopting these principles,

construction organizations in Asaba and other regions can enhance their project delivery, ensure better financial management, and achieve greater project outcomes. This study provides valuable insights for construction professionals and organizations aiming to optimize their project management practices and achieve sustained success in their projects.

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