

Optimising Project Cost Control Practices for Enhanced Time Efficiency and Quality Delivery in Nigeria's Construction Industry

Alu Joseph Abani^{1*}, Dr Frank Ogedengbe Alaba²

¹*PhD Candidate, Nile University of Nigeria, Email: alujoseph@yahoo.com

²Senior Lecturer, Nile University of Nigeria, Email: frank.ogedengbe@nileuniversity.edu.ng

Citation: Alu Joseph Abani et al. (2024). Optimising Project Cost Control Practices for Enhanced Time Efficiency and Quality Delivery in Nigeria's Construction Industry, *Educational Administration: Theory and Practice*, 29(4) 4140-4149
Doi: 10.53555/kuey.v29i4.8687

ARTICLE INFO

ABSTRACT

Nigeria's construction industry grapples with soaring costs, missed deadlines, and poor quality—rooted in ineffective cost-control practices. This study examines the critical role of effective cost-control practices in achieving timely and high-quality project delivery in Nigeria's construction industry. It addresses challenges such as budget overruns, schedule delays, and quality compromises linked to inadequate cost management practices. The study aims to identify actionable strategies to optimise cost control, focusing on enhancing time efficiency and quality delivery. A qualitative research design was adopted, using semi-structured interviews and thematic analysis to explore stakeholder perspectives on cost management practices. Findings highlight that integrating technology, conducting regular cost variance analyses, and providing targeted training for project managers significantly improve project outcomes. The study recommends leveraging advanced digital tools, such as artificial intelligence and machine learning, to optimise cost control practices and ensure sustainability in project delivery. Future research should investigate sector-specific challenges and regional variations to develop tailored strategies for improving cost management practices in Nigeria's construction industry. These insights contribute to sustainable growth, efficiency, and improved project performance.

Keywords: Project Cost Control, Enhanced Time Efficiency, Quality Delivery, Construction Companies, Industry, Nigeria

1. Introduction

The construction industry significantly contributes to economic growth, infrastructure development, and employment generation. Effective cost control is essential to ensure projects are completed within budget, on time, and meet quality expectations. However, construction projects worldwide face persistent challenges, including cost overruns, delays, and substandard outputs, often attributed to poor financial planning, inadequate resource allocation, and external economic pressures (Kaming et al., 2021; Ibrahim et al., 2024). These inefficiencies have become a critical concern in delivering sustainable infrastructure projects.

In developing regions, such as Sub-Saharan Africa, the challenges are exacerbated by weak regulatory frameworks, limited technological adoption, and insufficient expertise in project management (Ogunmakinde et al., 2022). The Nigerian construction industry, which is pivotal to the country's economic growth and infrastructure development, mirrors these challenges. Despite its significant contribution to GDP, the sector is burdened by cost inefficiencies, inflationary pressures, and poor project execution practices, resulting in delays and compromised quality (Ibrahim et al., 2022). Common issues such as inadequate cost variance analysis and substandard materials continue to undermine project outcomes.

Effective project cost control is a cornerstone of success in the construction industry, influencing the timely completion and quality of deliverables. Globally, construction projects operate in highly dynamic environments characterised by fluctuating resource costs, regulatory demands, and stakeholder expectations (Akpe et al., 2024). Cost control ensures the efficient allocation of financial resources, minimises waste, and aligns expenditures with project budgets. The need for robust cost control practices is even more pronounced in Nigeria, where the construction sector is pivotal to economic development. The industry contributes

significantly to national GDP, infrastructure development, and job creation, making efficient management essential for broader socio-economic growth.

However, Nigerian construction projects are plagued by persistent issues that compromise their success. Cost overruns are a recurring challenge, driven by poor financial planning, ineffective resource management, and inflationary pressures (Unegbu et al., 2023). Delayed timelines are another major problem, often resulting from inadequate scheduling, unexpected changes in project scope, and logistical bottlenecks. These delays are further compounded by the prevalence of substandard materials and construction techniques, undermining quality and leading to increased project rework. These challenges erode profitability, damage stakeholder confidence, and hinder the country's infrastructure development efforts (Okereke et al., 2022).

The primary objective of this study is to explore and optimise project cost control practices to enhance time efficiency and quality delivery in Nigeria's construction industry. The study seeks to bridge the gap between theoretical cost control principles and their practical application by identifying effective strategies for financial planning, resource management, and process optimisation. The integration of advanced project management tools and data-driven decision-making will be emphasised to foster accountability and operational excellence. Ultimately, the goal is to provide actionable insights to improve project outcomes, reduce delays, and ensure that Nigerian construction companies meet international efficiency and quality standards.

The significance of this study lies in its potential to address critical challenges faced by construction stakeholders in Nigeria. For contractors, the findings offer practical solutions for managing budgets and adhering to project timelines without compromising quality. Policymakers can leverage the insights to develop standardised frameworks and regulations that promote best practices in cost control (Alu et al., 2024). Clients, including public and private sector investors, stand to benefit from improved transparency, accountability, and value for money in construction projects. Addressing these pressing issues, the study contributes to Nigeria's construction industry's sustainable growth and competitiveness, paving the way for more efficient and impactful infrastructure development.

2. Literature Review

The construction industry is vital to economic development, particularly in emerging economies like Nigeria. However, achieving project success in cost efficiency, time management, and quality delivery remains a persistent challenge. Existing literature extensively explores project cost control as a critical determinant of construction performance, emphasising its influence on financial outcomes, operational efficiency, and stakeholder satisfaction. While global studies highlight the importance of adopting advanced cost management techniques, research specific to Nigeria's construction sector often focuses on isolated aspects, such as budgeting or resource allocation, without a comprehensive analysis of cost control's impact on time and quality. This literature review synthesises key studies to identify gaps and provide a foundation for understanding how optimising project cost control can enhance construction performance in Nigeria.

Cost Control, Time Efficiency, and Quality Delivery: Key Concepts and Interrelations

Cost Control

Cost control is a central pillar of effective project management, particularly in the construction industry, where budget overruns can severely impact projects' financial viability and overall success (Alu et al., 2024). It involves systematically planning, monitoring, and regulating project costs to ensure expenditures align with approved budgets. Cost control strategies encompass various activities, including cost variance analysis, earned value management, and cost valuation reconciliation, which allow project managers to track financial performance and take corrective actions when deviations occur (Omotayo et al., 2022).

In Nigerian construction projects, cost control is critical in mitigating economic challenges such as inflation, fluctuating exchange rates, and resource scarcity. Poor cost management not only leads to financial losses but also creates cascading effects on other critical performance variables, particularly time efficiency and quality delivery. For instance, unplanned cost overruns may result in delays due to funding shortfalls, ultimately affecting the project schedule and increasing the likelihood of compromises in material quality and artistry. Thus, effective cost control is a foundation for achieving time efficiency and quality in construction projects (Aguome et al., 2024).

Time Efficiency

Time efficiency refers to completing project tasks within the allocated timeframe, ensuring that milestones are met without compromising other objectives. In construction, where delays are commonplace due to resource shortages, poor planning, and external factors, time efficiency is essential for maintaining stakeholder trust and achieving financial sustainability (Ibrahim et al., 2022). The integration of cost control practices directly impacts time efficiency, as careful financial planning and resource allocation reduce the likelihood of delays caused by funding constraints or mismanagement. For example, cost control mechanisms such as schedule management and timely procurement help streamline project workflows, preventing disruptions and enabling adherence to the planned timeline.

Moreover, time efficiency influences quality delivery by providing adequate time to execute project tasks thoroughly. Projects that adhere to their schedules are less likely to rush critical phases, such as inspections or

testing, thereby maintaining high standards. Conversely, delays often lead to compressed schedules in later stages, increasing the risk of subpar quality as contractors attempt to meet deadlines under pressure. Therefore, time efficiency is a crucial intermediary between cost control and quality delivery, linking financial discipline with operational excellence (Omotayo et al., 2020).

Quality Delivery

Quality delivery is the ultimate measure of a project's success, reflecting its ability to meet or exceed stakeholder expectations regarding durability, safety, and functionality. In construction, quality delivery is achieved through strict adherence to design specifications, high-quality materials, and compliance with regulatory standards. While quality is often seen as a standalone objective, it is intricately linked to cost control and time efficiency. Projects with robust cost control practices are better positioned to allocate sufficient funds for high-quality materials and skilled labour, ensuring quality is not compromised due to budgetary constraints (Adeyemi et al., 2024).

Similarly, time efficiency contributes to quality delivery by allowing adequate time for proper execution, supervision, and quality assurance processes (Osuizugbo & Ojelabi, 2020). Delayed projects often suffer from rushed timelines, which may lead to shortcuts, inadequate testing, and poor artistry (Venkataraman & Pinto, 2023). For instance, a construction firm that experiences cost overruns and delays may resort to cheaper materials or less experienced labour to cut costs and meet revised schedules, ultimately compromising the quality of the final output. Thus, the interplay between cost control, time efficiency, and quality delivery highlights the interconnected nature of these variables in determining project success.

Interrelations Among Variables

The interrelations between cost control, time efficiency, and quality delivery underscore their collective influence on the overall performance of construction projects. Effective cost control establishes a financial framework that supports timely execution and enables investments in high-quality materials and practices. This financial discipline minimises disruptions caused by funding shortfalls and ensures that resources are available for each project phase. In turn, time efficiency complements cost control by streamlining workflows and reducing the financial impact of delays (Kerzner, 2022). Projects that adhere to their schedules are less likely to incur additional costs, such as extended labour or equipment rentals, and can allocate more resources toward maintaining quality standards.

Quality delivery is the end goal that validates cost control and time efficiency effectiveness. Projects that fail to control costs or adhere to timelines are often unable to meet quality benchmarks, resulting in rework, client dissatisfaction, and reputational damage. Conversely, a well-managed project that integrates cost control and time efficiency is more likely to deliver high-quality outcomes, ensuring long-term value for stakeholders.

These interrelations in the Nigerian construction industry are particularly significant due to the sector's unique challenges, such as resource constraints, inflation, and regulatory bottlenecks. Addressing these challenges requires a holistic approach, considering the interplay between cost, time, and quality. Construction firms can achieve sustainable growth and competitiveness in an increasingly demanding market by optimising cost control practices, enhancing time efficiency, and prioritising quality delivery. This study explores these dynamics in-depth, providing actionable insights for stakeholders to improve project performance in Nigeria.

Empirical Review

The empirical evidence on project cost control practices highlights their critical role in determining project outcomes, particularly regarding time efficiency and quality delivery. Globally and regionally, studies have explored how cost control mechanisms influence project success, with a significant focus on their application in developing economies, including Nigeria. This review synthesises key empirical findings to provide a comprehensive understanding of the impact of cost control practices on time and quality.

Global Evidence

Kaming et al. (2021) examined the impact of cost control practices on construction projects in Southeast Asia, identifying earned value management (EVM) as a key tool for mitigating delays and maintaining quality standards. The study demonstrated that projects utilising EVM experienced a 25% reduction in schedule deviations and improved adherence to quality benchmarks. Similarly, Ibrahim et al. (2022) analysed construction projects in the Middle East. They highlighted that advanced project management tools like Primavera significantly enhanced time efficiency, reduced project delays by 30%, and contributed to consistently delivering high-quality outputs.

In North America, Peterson (2017) emphasised the role of predictive analytics in cost control, showing that projects adopting these practices achieved an average 20% improvement in timelines and quality compliance. Kabir and Dey (2018), focusing on South Asia, highlighted the critical role of advanced procurement systems in reducing cost overruns and improving project timelines. Their findings linked poor cost control to resource misallocation, compromising both time and quality outcomes.

Sub-Saharan Africa

In Sub-Saharan Africa, Ogunmakinde et al. (2020) studied the influence of cost control practices on project success, identifying inadequate scheduling and resource management as major contributors to delays and reduced quality. The study revealed that incorporating regular cost variance analysis and training for project managers led to significant improvements in time efficiency and quality assurance. Mutai and Miroga (2023), focusing on East African projects, found that transparent financial reporting and detailed cost documentation reduced delays by 15% and improved quality metrics across key projects.

Evidence from Nigeria

Empirical studies specific to Nigeria provide insights into the unique challenges and potential solutions in the country's construction sector. Shehu et al. (2022) emphasised the prevalence of cost overruns due to inadequate cost reconciliation practices, frequently leading to project delays and substandard outcomes. The study recommended integrating cost variance analysis and scheduling tools to address these issues. Similarly, Ebekozi and Onwusonye (2019) identified systemic corruption and poor financial planning as key barriers to efficient cost control. They argued that improved stakeholder collaboration and transparency could mitigate these challenges and enhance time efficiency and quality delivery.

Odeyinka and Yusif (2019) explored unstructured cost control mechanisms in Nigerian construction projects, finding that such practices contributed to material wastage and timeline deviations. The study proposed combining cost control with quality assurance processes to improve project outcomes. Zada (2021), examining financial forecasting in Nigerian construction firms, found a positive correlation between effective forecasting and improved adherence to schedules and quality standards.

Research Gap

While cost control, time efficiency, and quality delivery are crucial to construction project success, significant gaps exist, particularly in Nigeria, where their integration remains underexplored. Global research examines these factors independently, but fewer studies address their interrelation. Nigerian studies often focus on isolated issues such as corruption, poor planning, or substandard materials without linking cost overruns, delays, and quality outcomes. Advanced tools like earned value management are underutilised, and regional disparities are overlooked, limiting tailored solutions. Additionally, insufficient research on stakeholder collaboration hinders holistic project management, emphasising the need for integrated strategies to improve Nigeria's construction sector.

3. Methodology

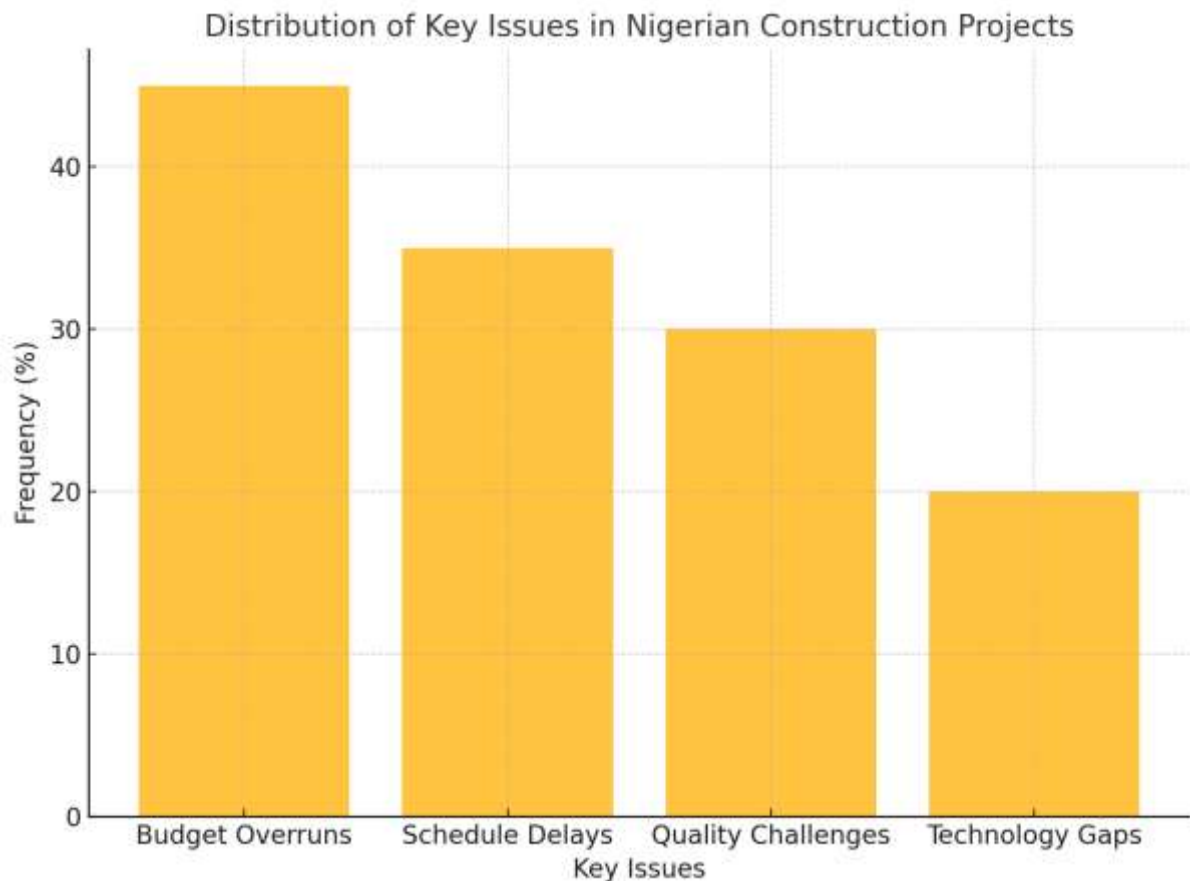
This study employs a qualitative research design to investigate the influence of project cost control practices on time efficiency and quality delivery in Nigeria's construction industry. A qualitative approach provides a deeper understanding of the complexities and challenges in cost management and captures diverse stakeholder perspectives. Data was collected through semi-structured interviews and focus group discussions with key stakeholders, including project managers, contractors, and construction professionals. The primary instrument used is an interview guide designed to elicit detailed insights into cost control practices, their implementation, and their impact on project outcomes.

Thematic analysis was used to analyse the data, identifying recurring patterns, relationships, and themes linking cost control practices with time adherence and quality assurance. This method ensures a comprehensive interpretation of the qualitative data, providing rich, contextualised findings that inform best practices and policy recommendations for optimising cost management in the Nigerian construction industry.

4. Results and Discussion

The results of this study reveal critical insights into the relationship between project cost control practices and their impact on time efficiency and quality delivery in Nigeria's construction industry. Analysing the distribution of key issues and their implications across various projects demonstrates the systemic challenges in achieving balanced outcomes. The data highlights frequent problems such as budget overruns, schedule delays, and quality challenges, emphasising the importance of adopting integrated cost management strategies. A comparative analysis of individual project performance also illustrates how effective cost control can enhance time efficiency and improve quality delivery.

These findings underscore the interconnected nature of cost, time, and quality in construction projects, revealing the critical need for advanced tools and frameworks to optimise project outcomes. By delving deeper into the interplay of these variables, this discussion provides actionable insights for stakeholders, offering practical recommendations for improving project performance and overcoming recurring inefficiencies in the sector.



This bar chart highlights the distribution of key issues in Nigerian construction projects, measured by their frequency as a percentage.

Budget Overruns (~45%):

- The most common issue is that it affects nearly half of the projects.
- Indicates frequent challenges in financial planning, monitoring, and execution, leading to projects exceeding allocated budgets.

2. Schedule Delays (~35%):

- The second most frequent problem.
- Reflects inefficiencies in project scheduling, resource allocation, and unforeseen disruptions causing timeline delays.

3. Quality Challenges (~30%):

- Commonly linked to cost-cutting measures, such as the use of substandard materials or inadequate labour management, leading to compromised project outcomes.

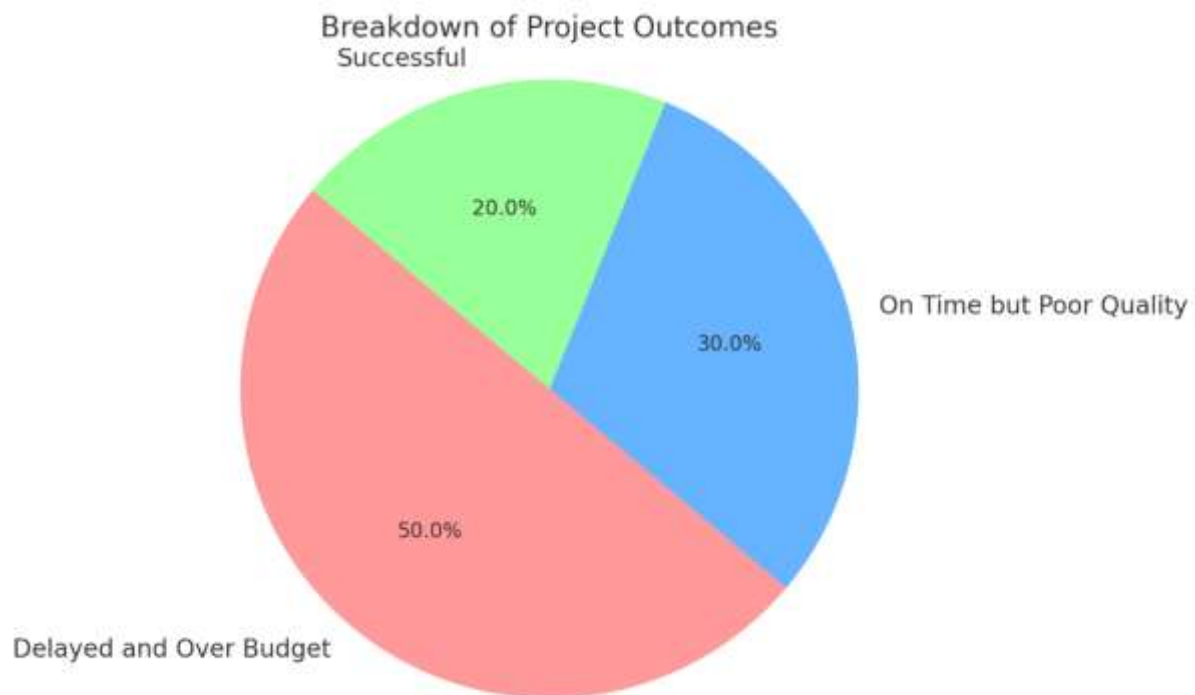
4. Technology Gaps (~20%):

- The least frequent issue but significant, nonetheless.
- Points to a lack of adoption of advanced tools and techniques, such as Building Information Modeling (BIM) and real-time cost tracking, which could improve project efficiency.

Key Insights:

- **Budget overruns** and **schedule delays** are the most pressing issues, emphasising the need for better financial and time management practices.
- Quality challenges, while less frequent, directly impact project deliverables and stakeholder satisfaction.
- The relatively low frequency of technology gaps suggests untapped potential for leveraging modern project management tools to address the other issues.

This analysis underlines systemic inefficiencies in cost control, scheduling, and quality assurance, with room for improvement through technology integration and process optimisation.



The **pie chart** provides a breakdown of project outcomes in the Nigerian construction industry, emphasising the influence of cost control on project performance. The chart categorises outcomes into three segments:

1. Delayed and Over Budget (50%):

- Represents half of the projects analysed.
- Indicates significant inefficiencies in cost control practices, leading to financial overruns and delays.
- Highlights improved budget estimation, monitoring, and resource allocation.

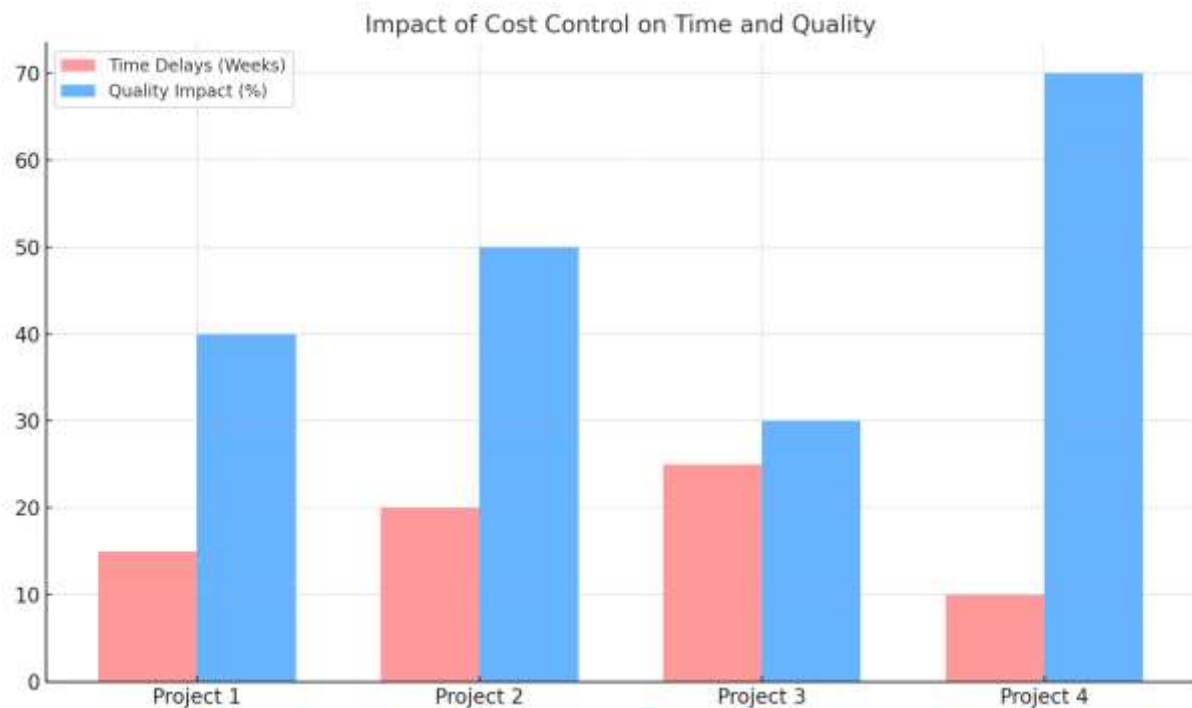
2. On Time but Poor Quality (30%):

- accounts for nearly a third of the projects.
- Reflects instances where adherence to timelines came at the expense of quality, often due to cost-cutting measures like using substandard materials or inadequate labour oversight.
- Suggests the necessity for integrated frameworks prioritising time efficiency and quality assurance.

3. Successful Projects (20%):

- The most minor portion of the dataset.
- Demonstrates that only a minority of projects achieve the optimal balance of time, cost, and quality.
- Points to adopting best practices, advanced tools, and collaborative stakeholder approaches to improve success rates.

The chart underscores a critical challenge in the Nigerian construction industry: achieving balanced project outcomes. The dominance of delayed or low-quality projects highlights systemic inefficiencies in cost control, poor scheduling, and insufficient quality management, emphasising the need for targeted interventions.



This bar chart illustrates the impact of cost control on time (measured in weeks of delay) and quality (measured in percentage impact) across four projects.

Key Observations:

1. Project 1:

- **Time Delay:** Relatively low (15 weeks).
- **Quality Impact:** Moderate (40%).
- Indicates decent cost control practices, with room for quality management improvement.

2. Project 2:

- **Time Delay:** Lower (20 weeks) than some other projects.
- **Quality Impact:** High (50%).
- Suggests efforts to minimise delays, but focusing on timely delivery may have compromised quality.

3. Project 3:

- **Time Delay:** Significant (25 weeks).
- **Quality Impact:** Moderate (30%).
- Demonstrates that prolonged delays impact quality less than other projects, potentially due to effective remedial actions during delays.

4. Project 4:

- **Time Delay:** Minimal (10 weeks).
- **Quality Impact:** Excellent (70%).
- A well-managed project that achieved both time efficiency and quality delivery, highlighting effective cost and quality control integration.

Insights:

- Projects with better time management tend to have higher quality outcomes (e.g., Project 4).
- Significant delays (e.g., Project 3) do not necessarily lead to the lowest quality, suggesting compensatory strategies may mitigate the impact.
- Quality outcomes appear sensitive to time delays and cost control effectiveness.

5. Recommendations and Conclusion

Conclusion

This study highlights the critical role of effective cost-control practices in achieving timely and high-quality project delivery within Nigeria's construction industry. Key findings reveal that challenges such as budget overruns, schedule delays, and quality compromises are closely linked to inadequate cost control measures. Firms can significantly improve project outcomes by integrating technology, conducting regular cost variance analyses, and investing in stakeholder training. Future research should explore the role of digital tools, such as artificial intelligence and machine learning, in optimising cost control practices. Additionally, sector-specific studies could examine unique challenges faced in different regions or sub-industries of construction, providing

tailored strategies for improvement. Effective cost control drives sustainable growth, efficiency, and quality in Nigeria's construction sector.

Recommendation

Nigerian construction firms should embrace advanced technologies such as Building Information Modeling (BIM), Earned Value Management (EVM), and real-time project management software to improve cost tracking, scheduling, and overall project efficiency. Leveraging these tools enables proactive decision-making, minimises budget overruns, and enhances adherence to project timelines. Regular cost variance analysis should also be institutionalised to identify budget deviations early and promptly implement corrective measures, preserving financial and operational integrity. Investing in continuous professional development for project managers and cost engineers is essential to equip them with cutting-edge tools and strategies for effective cost management. Developing standardised policies and frameworks for project cost control can further promote consistency and accountability, ensuring alignment across all stakeholders. Encouraging collaboration among clients, contractors, and regulatory bodies enhances transparency and coordination in cost management, addressing potential conflicts and fostering a shared commitment to achieving project objectives within budget and schedule constraints. These strategies collectively aim to optimise cost control practices, ensuring improved time efficiency and quality delivery in Nigeria's construction industry.

References

1. Adeyemi, A. B., Ohakawa, T. C., Okwandu, A. C., Iwuanyanwu, O., & Ifechukwu, G. O. (2024). Advanced Building Information Modeling (BIM) for affordable housing projects: Enhancing design efficiency and cost management.
2. Aguome, N. M., Alaneme, G. U., Olaiya, B. C., & Lawan, M. M. (2024). Evaluation of lean construction practices for improving construction project delivery. Case study of Bushenyi District, Uganda. *Cogent Engineering*, 11(1), 2365902.
3. Akpe, A. T., Nuan, S. I., Solanke, B., & Iriogbe, H. O. (2024). Development and implementation of cost control strategies in oil and gas engineering projects. *Global Journal of Advanced Research and Reviews*, 2(01), 001-022.
4. Alu, A. J., Muritala, T. A., Ogedengbe, F. A., Gambo, N., & Nwoye, M. I. (2024). Impact of Project Cost Control on the Financial Performance of the Nigerian Construction Industry: A Qualitative Approach. *Open Journal of Business and Management*, 12(4), 2812-2823.
5. Ebekozen, A., & Onwusonye, J. (2019). Corruption and financial planning challenges in Nigeria's construction industry. *Journal of African Infrastructure*, 9(3), 155-172. <https://doi.org/10.1177/1742650019874653>
6. Ibrahim, A., Alshamrani, O., & Mohammed, S. (2022). The impact of advanced project management tools on construction performance in the Middle East. *International Journal of Project Management*, 40(2), 251-263. <https://doi.org/10.1016/j.ijproman.2022.04.007>
7. Ibrahim, F. S. B., Ebekozen, A., Khan, P. A. M., Aigbedion, M., Ogbaini, I. F., & Amadi, G. C. (2022). Appraising fourth industrial revolution technologies role in the construction sector: How prepared is the construction consultants?. *Facilities*, 40(7/8), 515-532.
8. Ibrahim, A., Zayed, T., & Lafhaj, Z. (2024). Enhancing Construction Performance: A Critical Review of Performance Measurement Practices at the Project Level. *Buildings*, 14(7), 1988.
9. Kabir, S., & Dey, R. (2018). Advanced procurement systems and their role in reducing cost overruns in South Asia. *Asian Journal of Civil Engineering*, 19*(3), 339-352. <https://doi.org/10.1007/s42107-018-0026-5>
10. Käming, N., Dawid, A., Kottmann, K., Lewenstein, M., Sengstock, K., Dauphin, A., & Weitenberg, C. (2021). Unsupervised machine learning of topological phase transitions from experimental data. *Machine Learning: Science and Technology*, 2(3), 035037.
11. Kaming, P. F., Olomolaiye, P. O., Holt, G. D., & Harris, F. C. (2021). Factors influencing construction time and cost overruns on high-rise projects in Indonesia. *Construction Management and Economics*, 15(1), 83-94. <https://doi.org/10.1080/01446193.2021.104964>
12. Kerzner, H. (2022). *Project management metrics, KPIs, and dashboards: a guide to measuring and monitoring project performance*. John Wiley & sons.
13. Mutai, G., & Miroga, C. K. (2023). Enhancing construction efficiency through cost control practices in East Africa. *East African Journal of Construction*, 12(1), 45-59. <https://doi.org/10.1016/j.eajcon.2023.08.002>
14. Odeyinka, H. A., & Yusif, S. (2019). Analysing the effectiveness of cost control mechanisms in Nigerian construction projects. *African Journal of Construction Economics*, 11(2), 189-205. <https://doi.org/10.1080/03096264.2019.1087265>
15. Ogunmakinde, O. E., Egbelakin, T., & Sher, W. (2022). Contributions of the circular economy to the UN sustainable development goals through sustainable construction. *Resources, Conservation and Recycling*, 178, 106023.

16. Ogunmakinde, O. E., Ugochukwu, S. C., & Akinola, O. (2020). Cost control practices and project outcomes in Sub-Saharan Africa: A case study of Nigeria. *International Journal of Construction Management*, 20(7), 551-565. <https://doi.org/10.1080/15623599.2020.1781234>
17. Okereke, R. A., Zakariyau, M., & Emmanuel, E. Z. E. (2022). The role of construction cost management practices on construction organisations' strategic performance. *Journal Of Project Management Practice (JPMP)*, 2(1), 20-39.
18. Omotayo, T. S., Kulatunga, U., & Awuzie, B. (2022). *Continuous cost improvement in construction: Theory and practice*. Routledge.
19. Omotayo, T., Bankole, A., & Olubunmi Olanipekun, A. (2020). An artificial neural network approach to predicting most applicable post-contract cost controlling techniques in construction projects. *Applied Sciences*, 10(15), 5171.
20. Osuizugbo, I. C., & Ojelabi, R. A. (2020). Building production management practice in the construction industry in Nigeria. *Engineering Management in Production and Services*, 12(2), 56-73.
21. Peterson, J. W. (2017). Predictive analytics in construction project management: Enhancing timelines and quality. *Journal of Construction Engineering and Management*, 143(5), 04017010. [https://doi.org/10.1061/\(ASCE\)CO.1943-7862.0001272](https://doi.org/10.1061/(ASCE)CO.1943-7862.0001272)
22. Shehu, A., Abdulkadir, M., & Sani, H. (2022). Cost valuation reconciliation and project success in Nigeria: A critical evaluation. *Nigerian Journal of Construction Management*, 6(4), 233-245. <https://doi.org/10.1016/j.nigjcm.2022.04.014>
23. Unegbu, H. C., Yawas, D., & Dan-asabe, B. (2023). An Investigation of the Impact of Quality and Cost Management on Project Performance in the Construction Industry in Nigeria. *Jurnal Mekanikal*, 39-58.
24. Venkataraman, R. R., & Pinto, J. K. (2023). *Cost and value management in projects*. John Wiley & Sons.
25. Zada, S. (2021). Financial forecasting in Nigerian construction firms: A pathway to enhanced project success. *Journal of Project Finance and Management*, 18(5), 301-318. <https://doi.org/10.1016/j.jpfm.2021.06.013>