

APPRAISAL OF THE MITIGATING MEASURES TO THE CHALLENGES OF PROJECT COST CONTROL TECHNIQUES IN NIGERIA

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ABSTRACT

Effective project cost control is paramount for the successful delivery of construction projects within budget. However, the application of cost control techniques in Nigeria is fraught with challenges, including the use of obsolete methods, poor site management, and fluctuating material prices. While these challenges are well-documented, research on specific mitigating measures remains scarce. This study aims to identify and appraise the mitigating measures to the challenges of cost control techniques from the perspective of Nigerian quantity surveyors. A quantitative research approach was employed, utilising a cross-sectional survey design. A sample of 168 quantity surveyors from consultancy and contracting firms in Abuja, Kaduna, and Kano was selected using simple random sampling. Data were collected via a structured questionnaire and analysed using descriptive statistics (mean, standard deviation, and ranking) with the Statistical Package for the Social Sciences (SPSS). The study achieved a 44% response rate (n=73). Findings revealed that all thirteen identified mitigating measures were considered important. The most critical measure was Development of a proper system of site management and supervision, followed by Engaging the right professionals from the inception of the project. The least critical, though still important, measure was Creating awareness on the use of available tools and technology. The research concludes that a holistic implementation of the appraised measures is crucial for enhancing cost control efficacy in the Nigerian construction industry. It is recommended that firms prioritise development of proper systems of site management and supervision, while professional bodies should encourage continuous practice development through workshops/seminars.

KEYWORDS: *Construction Industry, Cost Control, Mitigating Measures, Nigeria, Project Management, Quantity Surveying.*

INTRODUCTION

The construction industry is a fundamental and critical driver of economic growth in developing nations, contributing significantly to the Gross Domestic Product (GDP), Gross Fixed Capital Formation, and fostering development through infrastructure provision (Sanusi, 2008). In Nigeria, despite its strategic importance, the industry's performance is often marred by persistent challenges, most notably project cost overruns (Rahman *et al.*, 2013).

The inability to complete projects within their approved budgets represents a major threat to contractors' profitability, client satisfaction, and the overall sustainability of infrastructure development.

Cost control, a fundamental component of project cost management, is the practice of identifying, monitoring, and reducing project expenses to ensure objectives are met within the stipulated budget (PMI, 2021; Will, 2020). It is instrumental in minimising resource wastage and

enhancing profitability (Adjei *et al.*, 2018). Its primary objective is to identify and reduce business expenses, thereby maximising value and profitability (Olawale & Sun, 2010).

Numerous techniques facilitate effective cost control, ranging from traditional methods like cost-value reconciliation to modern tools such as Earned Value Analysis (EVA), Critical Path Method (CPM), and specialised software like Primavera and Microsoft Project (Opatunji, 2018; Malkanthi *et al.*, 2017). However, the effective application of these techniques in Nigeria is hindered by significant challenges, including poor project preparation, fluctuating prices of raw materials, the use of obsolete methods, and inadequate site management, and lack of risk analysis, to monitor expenditure and manage variances from the baseline plan (Nuhu, 2019; Opatunji, 2018).

Previous research has extensively documented these challenges, which include fluctuations in material prices, poor site management, inadequate project preparation, inconsistent government policies, and the use of obsolete methods (Adjei *et al.*, 2018; Opatunji, 2018). While the problems are well-identified, a significant research gap exists concerning the systematic appraisal of measures to mitigate these challenges. As noted by Nuhu (2019), there is a pressing need for scholarly inquiry into solutions that can enhance the efficacy of cost control practices.

This study addresses this gap by empirically investigating the mitigating measures available to construction professionals in Nigeria. It focuses specifically on the perspectives of Quantity Surveyors, who, as construction economists and cost managers, are central to the financial stewardship of projects. The aim of this research is to appraise the importance of various mitigating measures to the challenges of project cost control techniques in Nigeria. This is achieved through the following objectives: to

identify potential mitigating measures to the challenges of project cost control from existing literature; to appraise the identified mitigating measures based on the perceptions of professional Quantity Surveyors in Nigeria.

The findings are intended to provide actionable insights for quantity surveyors and other construction professionals to fully realise the benefits of robust cost control practices, with a view to improving cost performance on construction projects, thereby enhancing the industry's overall efficiency and reliability.

LITERATURE REVIEW

Project Cost Control and Its Techniques

Project cost control is a dynamic process within cost management, focused on influencing the factors that create changes to the cost baseline and managing changes when they occur (PMI, 2021). Its purpose is to limit client expenditure to the agreed budget and ensure value for money. Over the years, a wide array of techniques has been developed to aid professionals in managing construction costs. These can be broadly categorised into traditional and modern methods. Traditional techniques include the bill of quantities (BOQ), approximate estimating, and cost-value reconciliation (Seeley, 1996). While still relevant, these methods are often supplemented or replaced by modern, more dynamic techniques. Modern techniques leverage analytical and software-based approaches to provide real-time project insights. These include:

Earned Value Analysis (EVA): A quantitative technique for evaluating project performance by integrating scope, schedule, and cost metrics (Cost Performance Index, Schedule Performance Index) to forecast project outcomes (Lucas, 2008; Opatunji, 2018).

Risk Analysis: This involves identifying, quantifying, and developing responses to financial risks that could impact project

costs, thereby creating contingency plans and mitigating potential overruns (Agnieszka & Mariusz, 2015).

Project Scheduling and Network Analysis (PERT/CPM): Program Evaluation and Review Technique (PERT) and Critical Path Method (CPM) are used to plan, schedule, and control project timelines and associated costs, allowing for optimisation and resource allocation (Gurcharan & Jagdish, 2013).

Whole-Life Costing: This technique evaluates the total cost of ownership, encompassing initial capital costs as well as subsequent operational, maintenance, and disposal costs, facilitating more sustainable and economically sound design choices (Ashworth, 2002).

Project Management Software: Tools such as Primavera and Microsoft Project have become indispensable for integrating scheduling, resource allocation, and cost/budget tracking, providing a centralised platform for project control (Corey *et al.*, 2018).

Challenges to Effective Cost Control in Nigeria

Despite the availability of these techniques, their successful implementation in the Nigerian construction industry faces significant impediments. Adjei *et al.* (2018) and Opatunji (2018) identified several key challenges, which can be synthesised into three categories:

Human and Managerial Factors: These include a lack of knowledge regarding modern tools and technologies, inconsistent application of cost control processes, and over-emphasis on results while ignoring the underlying causes of variances (Adjei *et al.*, 2018). Furthermore, a lack of professional development and an unwillingness to abandon obsolete methods hinder progress (Benjaoran, 2009).

Process and Systemic Factors: Many firms, particularly small and medium-sized enterprises (SMEs), lack formal cost control systems tailored to their needs. Other issues include poor project site management, inaccurate cost estimating methods, and flawed procurement practices, such as the over-reliance on the lowest-bid award system, which can lead to quality compromises and contractor failure (Malkanthi *et al.*, 2017; Opatunji, 2018).

External and Environmental Factors: The Nigerian construction environment is characterized by high volatility. Fluctuations in the prices of raw materials, inadequate funding, delayed payments from clients (especially government agencies), and inconsistent public policies create a high-risk environment that complicates budgeting and cost control (Nuhu, 2019; Sanni & Hashim, 2013).

Mitigating Measures for Cost Control Challenges

In response to these challenges, the literature suggests several mitigating measures. Nuhu (2019) and Opatunji (2018) emphasise the importance of continuous professional development through workshops and seminars to bridge the knowledge gap. The adoption of clear communication channels and the development of robust site management and supervision systems are also highlighted as critical (Nuhu, 2019). Thwala (2018) argues that engaging the right professionals from project inception is a foundational step to pre-empting many cost-related issues. Furthermore, addressing systemic problems requires providing suitable cost control processes for firms, ensuring adequate budget provisions, and adjusting government policies to facilitate prompt payments to contractors, thereby improving cash flow and reducing project delays (Opatunji, 2018; Nuhu, 2019). This study seeks to appraise these and other measures (Table 1) within the Nigerian context.

Table 1: Mitigating measures

S/N	MITIGATING MEASURES	SOURCES
1	Creating awareness on the use of available tools and technology	Opatunji, 2018; Nuhu, 2019
2	Adopt clear information and communication channel	Nuhu, 2019
3	Using the lowest most responsive bid to guard against abandonment	Nuhu, 2019
4	Adjusting government policies to prompt payment of valuation to avoid contractor's cash flow	Nuhu, 2019
5	Engaging the right professionals from the inception of the project	Twala, 2018; Nuhu, 2019
6	Provision of project cost control process and systems suitable to the enterprise	Opatunji, 2018; Nuhu, 2019
7	Enough budget provisions and financial commitment	Opatunji, 2018; Nuhu, 2019
8	Attending workshop and seminars by practitioners on construction project management	Opatunji, 2018
9	Attitudinal change for the successful implementation of project cost control practice	Nuhu, 2019
10	Development of a cost monitoring and periodical reporting of critical and long lead items	Nuhu, 2019
11	Monitor work program continuously for improvement	Nuhu, 2019
12	Development of a proper system of site management and supervision	Nuhu, 2019
13	Development of a proper system of site management and supervision	Nuhu, 2019

RESEARCH METHODOLOGY

Research Design

A cross-sectional survey design was employed using a quantitative approach. This design is appropriate for collecting data at a single point in time to appraise the perceptions and opinions of a specific population regarding a contemporary phenomenon (Creswell & Creswell, 2018).

Population and Sampling

The target population comprised 4,112 registered quantity surveyors in Nigeria (QSRBN, 2021). Using Yamane's (1967) formula with a 5% margin of error, a sample size of 120 was determined; an additional 40% ($n = 48$) was added to account for non-response (Salkind, 1997), yielding a total of 168 questionnaires distributed.

A purposive sampling technique was employed to select respondents, with knowledge of theories and practices of project cost control techniques. That is, non-probability technique chosen deliberately that target professionals with direct and extensive experience in project

cost management. The sample was drawn from Quantity Surveyors working in both consultancy and contracting firms located in Abuja, Kaduna, and Kano, which are major centres of construction activity in Nigeria.

Sample Size and Data Collection

A total of 168 questionnaires were distributed to the targeted professionals. Out of these, 73 were returned fully completed and deemed valid for analysis, representing a response rate of 43.5%. This response rate is considered adequate for survey-based research, as a rate above 30-40% is generally accepted as sufficient to avoid significant non-response bias (Moser & Kalton, 1971).

Data Collection Instrument

The primary instrument for data collection was a well-structured questionnaire. The questionnaire was divided into two sections. Section A collected demographic information of the respondents, including their nature of organisation, years of experience, professional qualifications, and academic background. Section B consisted

of 13 potential mitigating measures to the challenges of project cost control, which were identified from a comprehensive literature review. Respondents were asked to rate the importance of each measure on a 5-point Likert scale, where: 1 = Not at all important, 2 = Slightly important, 3 = Important, 4 = Fairly important, and 5 = Very important.

Method of Data Analysis

The collected data were analysed using the Statistical Package for Social Sciences (SPSS) Version 25. Descriptive statistics, including frequencies, percentages, mean scores, and standard deviations, were employed. To achieve the study's primary objective, a mean score ranking was used to appraise and prioritise the relative importance of the mitigating measures as perceived by the respondents.

Table 2: Demographic characteristics of respondents (N=73)

Variable	Category	Frequency	Percentage (%)
Nature of your Organisation	Consultancy	43	58.9
	Contracting	30	41.1
	Total	73	100.0
Years in practice	1 - 5 Years	13	17.8
	6 - 10 Years	33	45.2
	11 - 15 Years	17	23.3
	Above 15 Years	10	13.7
	Total	73	100.0
Professional qualification	Probationary member NIQS	30	28.8
	Member NIQS	22	30.1
	Fellow NIQS	21	41.1
	Total	73	100.0
Academic qualification	HND	8	11.0
	BSc	39	27.4
	MSc	22	31.5
	PhD	4	30.1
	Total	73	100.0

Note: Percentages for some categories have been adjusted for clarity based on original data frequencies.

Appraisal of Mitigating Measures

The core objective of the study was to appraise the importance of 13 mitigating measures. The mean score for each measure was calculated to determine its relative importance, and the results are ranked in Table 3. The analysis reveals that all 13 measures were rated as important (mean score > 3.0), indicating a general consensus

RESULTS

Respondent Demographics

The demographic profile of the 73 respondents is summarized in Table 1. The sample was composed of professionals from both consultancy (58.9%) and contracting (41.1%) firms. The majority of respondents (45.2%) possessed 6–10 years of experience, with a significant proportion having over 11 years of experience, indicating a well-experienced sample. In terms of professional status, the respondents were distributed across Fellow (41.1%), Member (30.1%), and Probationary (28.8%) members of the Nigerian Institute of Quantity Surveyors (NIQS). The academic qualifications were also high, with most respondents holding a BSc (35.0%) or MSc (38.7%).

among professionals on their value. Development of a proper system of site management and supervision was ranked as the most important measure, with a mean score of 4.40 (Std. Dev. = 0.740). Closely following was Engaging the right professionals from the inception of the project (Mean = 4.40; Std. Dev. = 0.812) in second place, and Monitor work program

continuously for improvement (Mean = 4.38) in third. At the lower end of the ranking, Using the lowest most responsive bid to guard against abandonment (Mean =

4.08), and Creating awareness on the use of available tools and technology (Mean = 3.81) were perceived as relatively less critical, although still considered important.

Table 3: Mean score ranking of mitigating measures

Mitigating Measure	N	Mean	Std. Dev.	Rank
Development of a proper system of site management and supervision	73	4.40	0.740	1
Engaging the right professionals from the inception of the project	73	4.40	0.812	2
Monitor work program continuously for improvement	73	4.38	0.775	3
Development of a cost monitoring and periodical reporting of critical and long lead items	73	4.36	0.752	4
Adjusting government policies to prompt payment of valuation to avoid contractor's cash flow	73	4.33	0.800	5
Enough budget provisions and financial commitment	73	4.27	0.854	6
Attitudinal change for the successful implementation of cost control practice	73	4.23	0.773	7
Provision of project cost control process and systems suitable to the enterprise	73	4.22	0.961	8
Adopt clear information and communication channel	73	4.21	0.927	9
Attending workshop and seminars by practitioners	73	4.19	0.844	10
Financial ability to serve as part of a qualification	73	4.11	0.906	11
Using the lowest most responsive bid to guard against abandonment	73	4.08	0.997	12
Creating awareness on the use of available tools and technology	73	3.81	0.995	13

DISCUSSION

The findings of this study provide a nuanced understanding of how Nigerian construction professionals prioritise measures to combat the challenges of project cost control. The high mean scores across all 13 items affirm that a multifaceted approach is necessary, but the hierarchy revealed in the ranking offers critical insights.

The top ranking of Development of a proper system of site management and supervision (Mean = 4.40) reinforces the importance of execution-level controls. This finding directly addresses a key challenge identified in the literature: poor site management (Malkanthi *et al.*, 2017). Respondents clearly indicate that even with the best professionals and plans, a failure to enforce discipline, monitor progress, and manage resources effectively on-site will inevitably lead to cost and time deviations. The equally high ranking of Engaging the right professionals from the inception of the

project (Mean = 4.40) is highly significant. It underscores the belief that human capital is the most critical defence against cost overruns. This aligns with the argument by Thwala (2018) that foundational expertise is paramount, as skilled professionals can anticipate risks, produce accurate estimates, and implement control systems effectively from the outset. In a complex environment like Nigeria's, the competence of the project team is viewed as the primary determinant of financial success.

The high importance assigned to Adjusting government policies for prompt payment (Rank 5, Mean = 4.33) highlights the profound impact of external environmental factors. This resonates with Sanni and Hashim (2013), who found that delayed payments severely disrupt contractors' cash flow, leading to work stoppages, financing costs, and ultimately, project cost escalation. The professionals' rating confirms that this policy-level issue is a

major bottleneck that requires systemic intervention.

Interestingly, creating awareness on the use of available tools and technology was ranked last (Mean = 3.81). While still rated as ‘important,’ its position is notable. This does not necessarily mean technology is unimportant. Instead, it may suggest a belief among practitioners that the availability of tools is secondary to the fundamental skills of the professionals who use them (the top-ranked measure) and organisational support (Benjaoran, 2009), and the processes within which they are applied. It could also imply that while awareness is good, practical training and integration into company-wide systems, covered by higher-ranked items like Provision of project cost control processes, are more critical. This presents a counterpoint to studies that focus heavily on technological adoption as a panacea (Adjei *et al.*, 2018).

Overall, the results suggest that professionals prioritise foundational and systemic solutions (people, processes, and policies) over more superficial or tool-specific interventions.

CONCLUSION AND RECOMMENDATIONS

Conclusion

This study set out to appraise mitigating measures for the challenges of project cost control techniques in the Nigerian construction industry. The research successfully identified and empirically ranked 13 measures based on the perceptions of experienced Quantity Surveyors. The primary conclusion is that while a comprehensive suite of measures is necessary, a clear hierarchy of importance exists. Foundational elements, such as securing competent professionals from project inception and instituting rigorous site management and supervision, are considered the most critical factors for successful cost control. Furthermore, systemic issues, particularly those related to client financial commitment and

government payment policies, are seen as major determinants of project cost performance. The study provides an invaluable, empirically-derived framework that moves beyond simply listing challenges to prioritising actionable solutions for the Nigerian construction industry.

Recommendations

Based on the findings, the following recommendations are proposed:

- i. Develop and enforce standardised, robust systems for site management, supervision, and progress monitoring, as these are seen as critical to translating plans into on-budget results.
- ii. Focus on recruiting and retaining highly skilled and experienced professionals for project teams from the earliest stages.
- iii. Develop enterprise-specific cost control systems tailored to firm size, project type, and risk profile.
- iv. Align Continuous Professional Development (CPD) programs with the highest-ranked measures. Offer advanced training in strategic cost management, site supervision, and contract administration.
- v. While promoting technological adoption, ensure that training emphasises the integration of tools within a sound process framework rather than focusing on software features alone.
- vi. Urgently review public procurement and payment policies to ensure prompt payment for certified works. The high ranking of this measure indicates its critical impact on the financial health of projects and contractors.
- vii. Enforce regulations that mandate the engagement of registered professionals on all public projects to ensure a baseline level of competence.

FURTHER STUDY

- i. A comparative study using inferential statistics could explore potential

- differences in perception between Quantity Surveyors in consultancy and contracting roles.
- ii. Qualitative research, such as in-depth interviews, could be conducted to explore the underlying reasons for the observed rankings, particularly the relatively low prioritisation of technology-related awareness.
- iii. Explore the causal relationships between these mitigating measures and project success metrics, or investigate the specific barriers to implementing these measures in different types of construction firms.

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