PROJECT PERFORMANCE

Effectiveness of Performance Measurement Metrics in the Nigerian Construction Industry: Evidence from Construction Professionals in Lagos State, Nigeria

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Abstract

Performance measurement supports the monitoring of construction projects, but commonly used indicators may not capture the full range of project outcomes. This study assessed the performance measurement metrics used in construction projects in Lagos State, their perceived effectiveness, implementation challenges and possible improvements. A descriptive survey was conducted using questionnaire responses from 300 construction professionals selected through purposive sampling. Data were summarized using frequencies, percentages, means and Relative Importance Index values. Budget variance was the most frequently used metric (mean = 3.65; RII = 0.91), followed by quality evaluation (3.45; 0.86), client satisfaction (3.44) and schedule performance (3.42; 0.86). Respondents generally considered current measures useful for assessing project success, safety compliance, early issue identification, budget and quality. The leading reported limitation was that existing systems did not cover all aspects of project performance (3.46; 0.87), followed by implementation cost (3.36; 0.84) and insufficient staff training (3.34; 0.84). Respondents supported context-specific measures, more detailed criteria, sustainability indicators, regular training and digital real-time monitoring. The findings suggest that conventional cost, time and quality measures remain important, but need to be used alongside safety, sustainability, stakeholder satisfaction, productivity and risk indicators. The results reflect the views of the sampled Lagos professionals and should not be treated as nationally representative.

Keywords: construction projects; Lagos State; Nigeria; performance measurement; performance metrics

1 Introduction

Construction provides buildings and infrastructure that support economic activity and quality of life. In Lagos State, ongoing demand for housing, transport, commercial development and public infrastructure makes reliable project delivery particularly important. Nigerian construction projects have experienced delays, cost overruns, disputes, poor quality, rework, low productivity and abandonment. Earlier studies identified cost variation and delays as persistent project delivery problems (Mansfield et al., 1994; Aibinu and Jagboro, 2002). In Lagos, non-excusable delay factors have also been associated with contractors' performance and project consequences (Ibironke et al., 2013).

Performance measurement compares actual results with planned objectives and helps project teams identify deviations and make decisions. Construction projects involve clients, contractors, consultants, design professionals and users, whose expectations of success may differ. Cost, time and quality remain central indicators, but construction success extends beyond these dimensions.

Research on construction performance measurement and key performance indicators has emphasized broader measures that account for project and stakeholder outcomes (Chan and Chan, 2004; Yang et al., 2010).

Nigerian studies have documented the use of cost, time, quality, client satisfaction, productivity and safety indicators. However, evidence from Lagos construction small and medium-sized firms has also pointed to limited use of formal performance measurement frameworks (Tunji-Olayeni et al., 2016). This study examines the metrics reported by construction professionals in Lagos State, their perceived effectiveness, implementation challenges and suggested improvements.

2 Materials and methods

2.1 Research design and participants

The study used a descriptive survey design. The target population comprised professionals involved in planning, delivering, monitoring or evaluating construction projects, including project managers, engineers, quantity surveyors, architects, contractors and consultants. Purposive sampling was used to select 300 construction professionals from firms in Lagos State. The reported respondent groups included engineers, consultants, quantity surveyors and project managers.

2.2 Instrument and analysis

Data were collected using a structured questionnaire covering respondent characteristics, performance measures in current use, perceived effectiveness, implementation challenges and potential improvements. The study reports descriptive analysis using frequencies, percentages, mean scores, standard deviations, rankings and Relative Importance Index values. The results presented here are respondents' reported use and perceptions.

2.3 Scope and limitations

The study is geographically limited to Lagos State and relies on questionnaire responses. The study identifies possible response subjectivity, sample size and time and resource constraints as limitations to generalizing the findings across Nigeria. The participant profile was concentrated in building and road construction, so the findings may not represent all project types or regions.

3 Results

3.1 Respondent profile

The sample comprised 300 respondents. There were 211 men (70.3%) and 89 women (29.7%). Most respondents were aged 30–39 years (172; 57.3%), held a bachelor's degree (184; 61.3%), and had 5–10 years of industry experience (185; 61.7%). Engineers formed the largest professional group (123; 41.0%), followed by consultants (75; 25.0%), quantity surveyors (53; 17.7%) and project managers (49; 16.3%). Building construction accounted for 140 respondents (46.7%) and road construction for 131 (43.7%).

3.2 Metrics reported in use

Budget variance received the highest mean score for reported use (3.65; RII = 0.91). Quality evaluation ranked next (3.45; 0.86), followed by client satisfaction (3.44), schedule performance

(3.42; 0.86), labour productivity (3.31; 0.83), risk management (3.29; 0.82), cost performance (3.27; 0.82) and safety performance (3.21; 0.80). Although safety ranked lowest among the listed indicators, its mean remained above the study's stated acceptability threshold.

3.3 Perceived effectiveness

Respondents rated current measures as generally effective. The highest mean scores (3.38) were recorded for measuring project success, assessing whether safety standards were met, and identifying problems early. Measures of budget performance and quality each had a mean of 3.37. Usefulness for project decision-making scored 3.33. Timeliness received the lowest mean (3.26), although it remained above the stated acceptability threshold.

3.4 Implementation challenges and improvements

The most prominent challenge was that current measurement systems did not cover all aspects of project performance (mean = 3.46; RII = 0.87). This was followed by high implementation cost (3.36; 0.84), lack of staff training (3.34; 0.84), difficulty applying measures consistently (3.26; 0.82) and insufficient project data (3.19; 0.80).

Respondents most strongly supported adapting performance measurement systems to the Nigerian construction industry (mean = 3.53; RII = 0.88). They also endorsed developing more detailed measures (3.47; 0.87), adding sustainability indicators and providing ongoing staff training (both 3.45; 0.86), and introducing digital real-time monitoring (3.37; 0.84).

4 Discussion

The prominence of budget variance, quality, client satisfaction and schedule performance indicates that conventional delivery and financial measures remain central to performance monitoring among the surveyed professionals. This pattern is consistent with the continued importance assigned to cost, time and quality in construction performance measurement. It also aligns with research arguing that construction success should be assessed using a wider set of project indicators (Chan and Chan, 2004; Yang et al., 2010).

Respondents considered current metrics useful for assessing project success and safety compliance, as well as for identifying issues early. However, the lower score for timeliness and the leading concern that current systems do not measure all performance dimensions point to a gap between familiar indicators and the breadth of project performance that should be monitored. The findings support the view that measurement systems need indicators tailored to project objectives and context. Research on process-based indicators likewise emphasizes monitoring project processes, rather than relying only on end results (Haponava and Al-Jibouri, 2012).

Safety received the lowest reported-use score, despite its perceived importance. Sustainability, stakeholder satisfaction, productivity and risk management should also be visible within the measurement system if it is to reflect a broad conception of performance. Prior Nigerian research has examined relationships between performance measures and project management practices (Unegbu et al., 2022).

Cost, training, consistency and data constraints may limit the practical value of performance systems. The support for local adaptation suggests that a framework should fit the conditions under which Nigerian projects are planned and delivered. More detailed indicators, training and digital monitoring

were all endorsed, but digital systems will depend on the quality and availability of project data. A practical approach is to agree on a balanced set of indicators, clarify how each is defined and collected, develop staff capability, and use timely project information to guide corrective action.

5 Conclusion and recommendations

This survey of 300 construction professionals in Lagos State found that budget variance was the most commonly reported performance measure, followed by quality, client satisfaction and schedule performance. Respondents generally viewed existing measures as useful for assessing project success, safety compliance, early issue identification, budget and quality. They also identified important limitations: incomplete coverage of project performance, high implementation costs, insufficient training, inconsistent application and gaps in project data. These findings are perceptions from a purposively selected Lagos sample.

Construction organizations should adapt performance measurement systems to local project conditions and combine cost, time and quality indicators with measures of safety, sustainability, stakeholder satisfaction, productivity and risk. They should define indicators clearly, improve staff training and data documentation, and consider digital real-time monitoring where it can be supported by reliable project information. Further studies could examine other Nigerian regions, follow projects over time and develop and test an integrated performance measurement model.

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