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Research Article

Evaluating Construction Project Performance: A Case of Construction SMEs in Lagos, Nigeria

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Abstract

Performance evaluation is a vital tool for assessing management performance and formulating corporate strategies. The Nigerian construction industry is reported to be very vibrant and one of the largest in Africa. It is made up of 78% indigenous firms and 22% foreign firms. The indigenous firms are predominately small and medium – sized. However, the Nigerian construction industry have been challenged to improve its performance because of reports of performance problems in terms of cost over runs, time over runs, poor quality of work, low productivity among other problems. The aim of the study was to establish the measures used by construction SMEs for evaluating performance. The study employed a case study research design. Five construction SMEs in Lagos, Nigeria were selected as case studies. The findings revealed that construction SMEs do not use any of the established performance measurement frameworks for evaluating performance. The main performance measures used by construction SMEs are cost, time, quality, customer satisfaction, profitability of the project, labour productivity, safety and team work. It was also established from the study that construction SMEs do not use supply chain management and employee satisfaction. It was suggested that construction SMEs should also use supply chain management and employee satisfaction because these measures have been found to impact positively on firms' performance.

Keywords: performance evaluation, construction SMEs, case study, Nigeria

Introduction

The need to improve performance in construction industries worldwide has become topical. For instance, the UK construction industry initiated several calls in this regard. These calls include the Simon (1944), Latham (1994) and Egan (1998) reports. In the US construction industry, rework (defect) contributes significantly to cost performance problems and accounts for an average of 5% of the total

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construction cost (Hwang *et al*., 2009; CII, 2005).

In developing countries performance problems are even bigger, compounded by lack of adequate resources and institutions to address them (Gyandu – Asiedu, 2009). In India, it is reported that 40% of construction projects face performance problems of time overruns (Iyer and Tha, 2006). The Ghanaian construction industry is saddled with several problems ranging from contract administration, complex and lengthy payment procedure and delayed payments (Gyandu – Asiedu, 2009).

In Nigeria, the construction industry is reported to be very vibrant and one of the largest in Africa (Adebayo, 2002 and Odediran *et al*., 2012). The construction market in Nigeria is made up of 78% indigenous firms and 22% foreign firms (Aniekwu, 1995). The indigenous firms are predominately small and medium – sized. The larger indigenous construction firms are small enterprises relative to most foreign firms (Adams, 1997). Nonetheless, the Nigerian construction industry has also been challenged to improve its performance. Evidences of poor performance in terms of cost over runs, time over runs, poor quality of work, low productivity among other problems are replete in the Nigerian construction industry literature (Tunji-Olayeni *et al*., 2012; Oke and Abiola – Falemu, 2009; Idoro and Akande- Subar, 2008; Omoregie and Radford, 2006; Aibinu and Jagboro, (2002).

The most crucial step in performance improvement is not the intervention, but rather the diagnosis because it is the effective diagnosis of performance needs and deficiencies that bring about success in performance improvement (Darryl, 2007). Improvement cannot be gained without measurement (evaluation) of performance (Baldwin *et. al.,* 2001). According to Osman (1999), measurement is the trigger for improvement. Like Rankin *et. al*., (2008) opined you cannot improve what you do not measure. The big question then is, what is it that should be measured (evaluated) in a construction project that would bring about success in performance improvement?

Previously performance was assessed by financial measures such as return on investment (ROI), the pyramid of financial ratio, the discounted cash flow (DCF), residual income (RI), economic value added (EVA) and cash flow return on investment (FROI). However, researchers (Letza, 1996; Kaplan, 1984 and Bourne *et al.,* 2000) started to become dissatisfied with these kind of assessment because financial performance measures were thought to be lagging. For example, financial data are reported in a lagging manner that inhibits a company from using it in steering a company effectively and by solely tracking financial data costs is kept down, such as that of overheads, which if not balanced, can seriously affect quality (van Schalkwyk, 1998).

This dissatisfaction with financial performance measures led to the introduction of contemporary performance measures like the balance score card, performance prism, performance pyramid and quality models. Some of these contemporary models have been adapted to construction while other performance measurement frameworks specifically for the construction industry have been developed.

However, construction SMEs have distinct characteristics in terms of size (employment and turnover), among other characteristics. As Ogunlana *et al*., (2003) suggested, performance improvement strategies which begin with performance measurement should be based on the unique organizational setup and many other local factors of a construction firm.

Hence this paper aims to answer the question: How does construction SMEs evaluate project performance?

Literature Review

Performance Measurement

Performance measurement is the process of determining how successful organizations or individuals have been in attaining their objectives (Sinclair and Zairi, 1995c). It is a means by which unnecessary causes of waste can be identified so that the organization knows where to focus its effort (Cain, 2004). The purpose of performance measurement is to provide timely and accurate feedback on the efficiency and effectiveness of operations and to focus attention on continuous improvement (Amaratunga and Baldry, 2002).

Performance Measures

Performance measures are vital signs of an organization which helps to recognize whether the activities of a process or the outputs of the process achieve the specified objectives. (Horonec, 1993). They can be used to translate the strategy of the organization into a set of goals and objectives and the results obtained through the measures reflect the successfulness of achieving the strategy (Eccles, 1991). Performance measures indicate the priority factors of the organization and the way the employees should behave to give maximum outcome to the organization (Neely 2002).

Performance Measurement Frameworks in General

Bassioni, Price and Hassan (2004) defines performance measurement framework as a general theoretical framework developed in a research that can act as the basis for companies performance measurement system.

Performance measurement dates back to the 1860s and 1870s when planning and control procedures were employed by the U.S. rail road (Chandler 1977; Kaplan 1984). Since then other performance measures have evolved.

Traditional Performance Measures

These performance measures include the return on investment (ROI) , the pyramid of financial ratio, the discounted cash flow (DCF), residual income (RI), economic value added (EVA) and cash flow return on investment (FROI) (Bassioni *et al*., 2004). Van Schalkwyk (1998) identifies several disadvantages of traditional financial measures: using financial performance measures encourages executives to keep cost down at the detriment of quality; financial performance measure is unable to identify complexities in business for example areas where resources are wasted; financial performance measure does not capture client needs and workforce motivation. Furthermore, Myers (1997) explained that traditional financial performance measurement results in overestimation when only the net income or earning is used as aggregate performance measure and another problem of underestimation occurs when a ratio- such as return-on-investment or return-on-equity is used. Financial performance measures have also been described as 'lagging'

The dissatisfaction with these measures led to the introduction of contemporary performance measurement frameworks discussed below.

Contemporary Performance Measures

Among all the contemporary performance measurement frameworks developed four of them are frequently used. They include: the performance pyramid, the balance scorecard, the performance prism and the EFQM excellence models.

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The Performance Pyramid

Cross and Lynch developed the performance pyramid in 1988. The performance pyramid illustrates the relationships among the basic performance criteria. According to Wedman (2010), the performance pyramid is a valuable tool that can be applied throughout a needs assessment to ensure that all aspects of a performance system are considered. The pyramid determines how each performance dimension relates to an identified need. For example, performance dimensions like cost (cost overruns) may hinder current performance. The performance pyramid provides a valuable framework that ensures that each foundation component of a performance system is addressed in all phases of a needs assessment. However, the framework also has some disadvantages. For example, the pyramid can be misinterpreted as a hierarchy and the pyramid does not provide a process for improving performance.

The Balance Scorecard

The balance scorecard was introduced by Drs. Kaplan and Norton in 1992. The scorecard focuses on four key issues: financial, customer, internal processes and innovation.

The balance scorecard, gives a broader perspective of the activities of the firm. It does not only serve as a performance measurement framework but it can also be used as a tool for organizing the operations of a firm in such a way that all the activities of the organization are linked up with strategy.

Although the score card has been widely employed in research and industry, it has some limitations. For example, it has been noted that majority of the balance scorecard initiatives fail (Neely and Bourne, 2000) and the four perspectives of the scorecard are insufficient (Kagioglou *et al*., 2001).

The Performance Prism

Neely and Adams developed the performance prism in 2001. Neely, Adams and Kennerley (2002) explained that the performance prism is like a thinking aid which integrates five related perspectives and provides a structure that enables executives to think through five fundamental questions of: who are our stakeholders and what do they want and need? (Stakeholder satisfaction); what do we want and need from our stakeholders? (Stakeholder contribution); What strategies do we need to put in place to satisfy sets of wants and needs? (Strategies); What processes do we need to put in place to satisfy these sets of wants and needs (processes) What kind of people, practices, technologies and infrastructure do we need to put in place to allow us to operate our processes more efficiently and effectively ?(capabilities). Bassioni *et al*., (2004) provided a sequence for measuring performance and advocated that performance measurement should focus first on measuring stakeholders' needs and contributions and then on the required strategies, processes and capabilities.

Quality Management Frameworks

Quality management frameworks have also emerged in the last few years to improve performance. They include: the European foundation for Quality management (EFQM), Excellence Model in Europe, the Malcolm Baldrige National Quality Award (MBNQA) in the United States and the Deming Prize in Japan. In spite of the popularity of quality models, Bassioni (2004) raised several concerns against it: are quality models equivalent to total quality management? Does the success of quality model affect bottom-line financial results? Criteria for quality models are vague and under-rated in the areas of improvement, innovation and supplier partnership strategies.

Of all the contemporary performance measurement frameworks balance scorecard and the European foundation for Quality management (EFQM) have been noted as the most widely used performance frameworks in construction (Robinson *et al*., 2002)

However, other performance measurement frameworks have been developed to suit the specific nature of the construction industry.

Performance Measurement Frameworks in the Construction Industry

In the construction industry, a variety of performance measurement frameworks have emerged. They include:

Construction Project Performance Frameworks

- ***Integrated Performance Index (IPI) –*** Is a framework developed by Pillai *et al*., (2002) for assessing the performance of research and development (R&D) projects in India. The advantage of IPI is that it can be applied to all the phases of the project life cycle. However, the way in which its mathematical formulae are used to integrate the identified key factors into an integrated performance index is not clear. (Takim *et al*., 2003)

- ***Key Performance Indicators (KPI)*** - Was introduced in the UK construction industry after the Egan 1998 report. Key performance indicators consists of seven project performance indicators: construction cost, construction time, cost predictability, time predictability, defects, client satisfaction with product, client satisfaction with service and three business performance indicators namely: safety, profitability, and productivity. The advantage of this framework is that the overall concepts are easily understood and implemented by project participants (Takim *et al*., 2003). However, the measures used for KPI are retrospective (Takim *et al*., 2003) and they are not compartmentalized along project phases

Client Satisfaction Framework – In the UK, the CCF/CBPP (1998; 1999) and the CIB (1999) introduced performance measures which enabled client to measure the performance of the contractor. These metrics were however, reported to be retrospective (Ankrah and Proverbs, 2005).

Contractor Business Performance Framework – Mbugua (2000) developed a frame work for assessing the business performance of contractors in the UK. The major advantage of the frame work was that it synthesizes several existing business performance frameworks such as the balance score card (Ankrah and Proverbs, 2005). However, most of its measures cannot be applied in a project context and it is retrospective. Robertson (1997) developed the fundamental behavior to performance to outcome (B-P-O) cycle for business performance measurement in a construction company.

Participant's Project Performance Framework – Soetanto *et al*., (2002) developed a framework for evaluating the project performance of all participants of a construction project in the UK. It was found out that the measures employed in the frame work were mainly retrospective.

Contractor's Project and Business Performance Framework – A framework for assessing contractor's project and business performance in the UK was developed by Xiao (2002). The framework was reported to be retrospective (Ankrah and Proverbs, 2005). In Brazil Costa, Lima, and Formoso, (2004) also developed another framework for evaluating the project and business performance of contractors. Although, the frame work

consisted of some 'leading' measures, it made use of too many measures.

Project Quality Performance Framework - The construction industry development board Malaysia, developed a framework called QLASSIC to evaluate contractor's quality performance (CIDB Malaysia, 2006). The major strength of this frame work is that it is easy to implement (Ankrah and Proverbs, 2005). However, it is retrospective and measures only structural, architectural and external works. (Takim *et al*., 2003).

In Hong kong, Chan (2001) developed a project quality performance framework. The framework was based on the variables of client, project, project environment, project team leader, project management act and project procedure. Chan (2001) found out a causal relationship between the factors affecting quality performance. A weakness of the framework is that its variables are not grouped based on project phases and fail to identify the responsibility, needs and expectations of project stake-holders in each project phase.

In the US, blue print was introduced to measure quality performance on engineer-procure-construct (EPC) (Stevens, 1996). Blue print involves four stages. Stage one; project variables important in improving quality are identified. Stage two; the reasons and time when these variables should be measured are illustrated. Stage three; examples of how to measure these variables are given and stage four; suggestions on how the results of the measure can be used in making project decisions are provided (Takim *et al*., 2003).

Construction Productivity Measurement Framework – Winch and Carr (2001) developed a computerized activity sampling called the CALIBRE approach for assessing construction productivity of on-site performance. This frame work measures performance, based on the activity of an identified worker at a particular location and point in time (Takim *et al*., 2003). Although the frame work enables contractors to compare their physical productivity performance with others and to improve on project productivity, the framework would require an expert to input the data to ensure reliability and validity of the data (Takim *et al*., 2003)

Other frameworks include the self-auditing performance measurement system which examines the use of information technology based management tools (Bitici and Turner, 2000), Construction firms' performance evaluation model using the financial, economic and industrial characteristics of companies (Elyamany *et al*., 2007), the six sigma concept to construction (Pheng and Hui, 2004), resource based and institutional perspectives for identifying the industry and company specific factors that affect construction companies' performance (Phua, 2006).

Methodology

The paper adopts a case study research design. Case study is an empirical enquiry that investigates a contemporary phenomenon within its real life context, especially when the boundaries between phenomenon and context are not clearly evident (Yin, 2003). Case studies are most suitable for answering the how questions. Case studies provide a rich understanding of the context and processes of a research (Morris and Wood, 1991).

Five construction SMEs in Lagos, Nigeria were selected as case study. This number is sufficient to provide a reasonable confidence level (Yin, 2003). A number between four and ten will usually suffice for case study; anything below this number renders theory generation difficult and data volume and complexity becomes inhibitive above ten cases (Miles and Huberman, 1994).

The Interview Process

Five professionals were interviewed to elicit information on how construction SMEs measure performance. Once pleasantries were exchanged, each interview proceeded like a normal conversation. The interview began with asking the respondents about the characteristics of the firm in terms of employment size, turnover, and etc.in order to establish contextual factors.

The interview continued by asking about respondents' knowledge of established/contemporary performance measurement frameworks. The interviewer probed further to find out the criteria for evaluating project performance of construction SMEs. At this point structured questions with likert scale were employed for two reasons: to reduce the disadvantages associated with participant reluctance and interview bias and to facilitate comparison between firms (Cooper and Schindler, 2003)

Data Analysis and Presentation

The research employed both inductive and deductive qualitative approaches to data analyses. The inductive analyses were in the form of identification of themes and patterns while deductive analyses took the form of comparison of themes and patterns. Table 1 below presents the contextual factors of the firms studied.

Table 1: Contextual Factors of Firms Studied

FIRM	Workforce (site + head office)	Turnover in Billions =N=(last year)	Designation of respondent	Professional Background Of respondent	Main area of activity	Sector of operation
A	12	0.2	Project QS	QS	sub-contractor	Building
B	30	0.5	Project Manager	Architecture	Main contractor	Building
C	50	0.7	Project Manager	Builder	Main contractor	Building
D	80	0.9	Project QS	QS	Main contractor	Building
E	150	1.1	Project Manager	QS	Main contractor	Building and Civil

Table 1 above reveals that the firms studied were of different sizes in terms of work force and turnover. The size of workforce for the firms A, B, B, D and E were 12, 30, 50, 80 and 150 respectively. Turnover for last year was 0.2, 0.5, 0.7, 0.9 and 1.1 billion naira respectively. Majority of the firms studied were involved in building operations alone. Only firm E engaged in building and civil operations.

Table 2 below gives the frequency of use of contemporary performance measurement frameworks by construction SMEs

Table 2: Utilization of Contemporary Performance Frameworks by Construction SMEs

S/N	PERFORMANCE MEASUREMENT FRAMEWORKS	A	B	C	D	E
1	Balance score card	NU	NU	NU	NU	NU
2	Performance prism	NU	NU	NU	NU	NU
3	Performance pyramid	NU	NU	NU	NU	NU
4	Excellence models	NU	NU	NU	NU	NU

*NU-Never used

The interview with professionals in the five construction SMEs studied revealed that none of the firms employed any of the established performance measurement frameworks.

Table 3 below Indicate the Frequency of Use of Other Criteria for Evaluating Performance by Construction SMEs

S/N	Criteria for evaluating performance	A	B	C	D	E	Frequency
1	Cost	x	x	X	x	x	5
2	Time	x	x	X	x	x	5
3	Quality	x	x	X	x	x	5
4	Customer satisfaction	x	x	X	x	x	5
5	Safety	-	-	X	x	x	3
6	Profit on project	x	x	X	x	x	5
7	Employee satisfaction	-	-	-	-	-	
8	Supply chain management	-	-	-	-	-	
9	Labour productivity	-	x	X	x	x	4
10	Team work	-	-	-	x	x	2

Table 3 reveals that the most frequently used criteria for evaluating performance in construction SMEs are cost, time, quality, customer satisfaction and profit on project, . The table also reveals that construction SMEs do not consider employee satisfaction and supply chain management as criteria for evaluating performance of construction SMEs

Discussions of Findings

Research findings summarized above indicate that construction SMEs make use of cost, time, quality, customer satisfaction, profitability of project, labour productivity, safety and team work for evaluating performance. These measures are similar to the measures of performance that have emerged in management literature. For instance, project performance measures (Belassi and Tukel, 1996); customer satisfaction measures (Bititci and Turner, 2000); financial measures e.g profit (Kangari et al., 1992); labour productivity (Olomolaiye et al 1998); safety and team work (Chan, Scott and Lam, 2002).

However, the study also reveals that performance criteria such as supply chain management and employee satisfaction were not considered as performance measures. These dimensions are equally important because they have also been

found to impact positively on firms' performance. For instance, Bourn (2001) explains that supply chain management improves the efficiency and effectiveness of construction firms. Moreover, construction is labour intensive and the industry suffers from shortage of qualified manpower (Hegazy *et al*., 2000). One way to retain employee is to ensure that they are satisfied with working conditions. Employee satisfaction is important to the performance of construction SMEs.

Conclusion

Construction SMEs are more oriented towards the use of cost, time, quality, customer satisfaction, project profitability, productivity and team work as measures of performance. It is suggested that construction SMEs should also employ the performance measures which are not currently in use because of the impact of such performance dimensions on firms' performance.

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