West Africa Built Environment Research (WABER) Conference
10th Anniversary Conference, 5-7 August 2019, Accra, Ghana
Proceedings Edited by Laryea, S. and Essah, E.
ISBN: 978 – 9988 – 2– 6010 – 1
DOI: https://doi.org/10.33796/waberconference2019.57

PERFORMANCE BENCHMARKING SYSTEM FOR THE NIGERIAN CONSTRUCTION INDUSTRY

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Nigerian Construction Industry is large and plays a major role in the economic growth of the country's economy. Decision makers in the industry are always making efforts to ensure there is improved quality in the activities of the industry such as strategic planning, marketing, restructuring, financial management etc. Benchmarking as a viable instrument for making and also maintaining competitive advantage became popular among stakeholders and participants due to the growing competition in the construction industry. The objective of this research study was to understudy the implementation of performance indicators for construction industries for developed and developing countries with a view to giving an insight to the formation of a performance benchmarking system for the NCI. This research work reviewed benchmarking initiative scopes while identifying the benefits derived from its implementation and areas of improvement. The selected construction industries reviewed are Brazil, Chile, South Africa, USA and UK. From the reviewed literatures, it is clear that the NCI need to benchmark performance. The study concluded by highlighting that a clear understanding of performance which needs to be improved and why it should be improved must be established while the lessons learnt from these systems should be used in formulating the appropriate performance benchmarking system for the NCI.

Keywords: benchmarking, business competition, construction industry, performance indicators

INTRODUCTION

Nigerian Construction Industry is large and plays an important role in the growth of the country's economy. In the 1940s, award of construction projects to private organisations kicked off in Nigeria enabling some foreign organisations to operate. Prior to this time, construction projects are executed by government institutions (Olowookere, 1985). With the independence in 1960 bolstered by 1970's oil boom, an upward shift was experienced in the activities of the construction industry. Foreign organisations dominated the Nigerian construction industry during these periods and the industry witnessed an overwhelming development in private

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organization participation in construction activities. With the high number of foreign organisations, it was evident that there is low level of human resource development in indigenous construction organisations. These resources are needed for designing, planning, constructing and maintaining the size and number of conceived projects by the government (Idoro, 2009). Nevertheless, by enhancing the education system, employment of expatriates, coaction between expatriates and indigenous entrepreneurs, improved policies and stability of the political system, the apparent gap of human resources needed for completing a complex project between indigenous organisations and their foreign counterparts is being bridged gradually (Mbamali and Okotie, 2012).

In 2007, Osofisan criticized the Nigerian construction industry as one of the slowest to integrate technological advancement. The researcher added that the issue of Information Technology (IT) in the building industry is hence relatively limited compared to other sectors. Osofisan (2007) stressed further that IT implementation across all sector of the building industry may be more difficult than in other industries and thus advocated the need for innovative ideas and improved processes for the industry to remain competitive in present day digital economy. Universally, decision makers in the industry are always making efforts to ensure there is improved quality in the activities of the industry such as strategic planning, marketing, restructuring, financial management etc. Despite the importance of performance measurement data (such as quality, time, cost, etc), construction companies don't widely identify and collect them. This has therefore resulted in the unavailability of performance information of the construction industry (Costa, Formoso, Kagioglou, Alarcon and Caldas 2006). According to Formoso and Lantelme (2000), this is largely because construction organisation managers do not have the necessary training and they show reluctant attitude towards collecting performance data. As a matter of fact, most construction contracting organisations have wide range of project variables they measure and control but few of them take project performance as one of the variables measured which is expected to inform them on decision-making processes during execution of the project and subsequent projects.

Benchmarking as a viable instrument for making and also maintaining competitive advantage became popular among stakeholders and participants due to the growing competition in the construction industry. Although Benchmarking is not a new technique, it has however found more subscribers among professionals in the industry recently and it now takes the centre stage in improving quality within the industry. The objective of the study is to determine the formation of performance benchmarking system for the Nigeria construction industry. This is with the view to understand performance benchmarking systems used in developed and developing countries. To achieve this, this study relies solely on a wholly review of performance benchmarking systems (with consideration for all available performance measurement indicator) for construction projects in selected developed and developing countries was carried out. The idea of using these construction industries was dependent on the research study of Pinheiro (2011) who carried out a similar study of formulating an accepted performance benchmarking system for the Portuguese construction industry having drawn the conclusions from benchmarking systems of developed and developing countries.

Secondary data was used to arrive at the proposed performance measurement indicators for the Nigerian construction industry. Search for literature was carried out using "construction industry", "benchmarking" and "performance measurement" as keywords on the ISI Web of Science and SCOPUS databases. The choice of using these databases is based on the submission of Guz and Rushchitsky (2009) that ISI Web of Science and SCOPUS databases are the mostly widespread databases for research articles that are related to scientific fields. The search produced over 300 publications which were carefully examined to determine if they are related to the focus of this research study. 69 articles met the criteria to be considered for this study but the search was limited to publications between 2000-2018 and filtered further by limiting the search to conference publications and journal articles. A total of 28 published articles were eventually found relevant as they address performance benchmarking studies of developed and developing construction industries across the world. Performance benchmarking for this study therefore refers to all indicators used for measuring performance of stakeholders on construction projects within the reviewed construction industries.

BENCHMARKING

Kyro (2003) submitted that the term benchmarking has gained recognition in business life as a tool useful for improving organisation's competitiveness and performance. Ball (2000) together with McAdam and Kelly (2002) corroborated this stating that benchmarking scope has extended beyond large firms to both small business and the public sector including semi-public sector. By definition and classification, benchmarking varies depending on the criteria and the time the research works centres on while the idea remains the same. According to Ball (2000), "Benchmarking is first and foremost a tool for improvement, achieved through comparison with other organisations recognised as the best within the area". This involves learning how to upgrade basic organisation activities, procedures and management routines. It helps in the evaluation and application of best practice which will give room for improving quality. Supporting the above definition, Prado (2001) defined benchmarking as "a research and observation of the best practice of competitors and/or search for the best industry practice leading to producing the more superior performance". Ajelabi and Tang (2010) took the definition further by stating that benchmarking doesn't only carry out comparative performance measurement, it also analyses the process of attaining exceptional performance which are keyed out by performance indicators measures referred to as benchmarks and the preceding activities to the exceptional performance referred to also as enablers. All these definitions show that evaluating performances of competitors as well as analysing ways of improving on them are the core concepts of benchmarking which was pointed out by different researchers (Ball, 2000; Longbottom, 2000; Zairi and Whymark, 2000a, b; Comm and Mathaisel, 2000; Fernandez et al., 2001; Prado, 2001; Carpinetti and de Melo, 2002; Yasin, 2002; Ajelabi and Tang, 2010).

Benchmarking can be in three forms which are Internal, Competitive and Generic benchmarking. When there is a comparison of operations internally within an organisation based on two or more different projects being executed, this is referred to as Internal Benchmarking which helps the organisation in achieving 'best in company' level of performance. Competitive Benchmarking occurs when

there is a comparison of products, function of interest or service against specific competitors. It is more complex and difficult to carry out but it will provide information based on what competitors are achieving. Generic Benchmarking is said to be a comparison of business process/function across industry or country as long as they are the same in approach (Construction Excellence, 2010). This study therefore adopts the generic benchmarking system to evaluate performance measurement across the construction industry.

Application of benchmarking concept in the construction industry has commanded considerable interest over the last decades as reported in literatures based on project duration context, partnering performance, contractor selection, safety management and information technology evaluation (Palaneeswaran and Kumaraswamy, 2000; Li et al., 2001; Yasin, 2002; Mohamed, 2003; Stewart and Mohamed, 2004; Costa et al., 2006). Benchmarking therefore being a process of assessment encourages continuous learning for low level staffs, managers and the organisation at large (Barber, 2004). The process of benchmarking gives room for generating innovation within a receptive environment which can be in form of clubs or forums for individual organisation to learn from local support network best practices (Mohamed, 2003; Constructing Excellence, 2010). Over the years, developed and developing countries have adopted a performance benchmarking system for their construction industries among which are the United States, Chile, Denmark, Australia, Brazil, United Kingdom, Hong Kong, Singapore and Netherlands (CII, 20180; Byggeriets Evaluerings Centre 2002; Barber, 2004; Costa et al., 2004; Constructing Excellence, 2010; Bakens et al., 2005). All these authors have succeeded in giving extensive reports on how the benchmarking systems were formulated, implemented and the challenges encountered. The chief target of the programs is to identify the key factors required for effective design and performance measurement implementation system. These programs were set up in these countries related to performance measurement creation and implementation with some set of aims and objectives which are (i) to formulate benchmarks for establishing business goals and objectives by individual companies; (ii) to offer performance measurement guidance; and (iii) to disseminate and identify industry best practices through reports generated from benchmarking clubs/networks.

Performance Benchmarking – Other Nations' Experience

In the United Kingdom (UK), Key Performance Areas (KPA) was launched in 1998 by the Best Practice Programme with the purpose of enabling measurement of organisation and project performance using large number of projects thereby providing indications as regards performance of the UK construction industry. To further progress the performance measurement, "the Construction Excellence body was created which is an amalgamation of Rethinking Construction and the Construction Best Practice Programme (CBPP)". Construction Excellence body was created to tackle market failures in the UK construction industry and sell business case for improvement. Some set of KPAs were formulated which are updated annually by the CBPP. These KPAs are used by organisations for improving performance opportunities and market advantages. Presently, the KPAs in use are but not limited to: "Client Satisfaction, Construction Time & Cost, Defects, Productivity, Employee Satisfaction, Profitability, Health & Safety, Staff Turnover, Working Hours, Sickness Absence, Impact on Environment, Qualifications & Skills,

Waste, Whole Life Performance, Commercial Vehicle Movements etc". These KPAs can be applied at company level or project level depending on which indicator is to be put into use (Beatham et al., 2004; Construction Excellence, 2010).

In Chile, The National Benchmarking System (NBS) came into existence in 2001 by the collaboration of the "Corporation for Technical Development (CDT) of the Chilean Chamber of Construction and Program for Excellence in Production Management of Pontificia Universidad Catolica de Chile (GEPUC)". The benchmarking system was aimed at identifying best practice, analysing them and then generate improvement opportunities on short-term basis for participating companies. Several performance indicators were identified which were analysed having carried out empirical research and conducted meetings with companies' representatives before the approved indicators were established for use in the Chilean Construction Industry. The NBS therefore, came up with the following sets of performance measurement indicators: "deviation of cost by project, risk rate, deviation of construction due date, accident rate, change in amount contracted, efficiency of direct labour, rate of subcontracting, productivity performance, client cost complaints, planning effectiveness and urgent orders". These sets of indicators are applicable to five sections of the Chilean Construction Industry which are: low-rise building, high-rise building, civil works, light industrial construction and heavy industrial construction (Costa et al., 2006).

Construction Industry Institute Benchmarking and Metrics (CII BM&M) programme for United State of America (USA) kickstarted in 1993 by the Construction Industry Institute with the aim of providing a self-analysis tool to its member organisations which will help in quantifying the use and value of best practice. Over the years, the CII BM&M program continues to evolve in order to meet the needs of participating organisations, construction industry objectives and support the institute's strategic goals. Database for the CII BM&M consists of both local and international participants with about 25% amounting to the international input. Projects considered includes building sector, light industrial sector, heavy industrial sector and infrastructure industry sector with the larger part from heavy industrial sector. It was reported that organisations that use benchmarking more tend to experience a better cost, safety and schedule performance. The indicators adopted by the CII BM&M includes: "Project Cost Growth, Project Budget Factor, Project Schedule Growth, Project Schedule Factor, Lost work day case incident rate, Recordable Incident rate, Change cost factor and Total field rework factor" (CII, 2018; Ahmad, Svalestuena, Andersena and Torp, 2016).

The "Building Innovation Research Unit (NORIE) of the Federal University of Rio Grande do Sul (UFRGS), the Association of Building Contractors of the State of Rio Grande do Sul (SINDUSCON/RS) and the Agency for the Support of Micro and Small Businesses (SEBRAE/RS)" in 1993 established the Performance Measurement System for the Brazilian Construction Industry (SISIND) project with the aim of propagating the concept, practice and principles of measuring performance in the Brazilian Construction Industry. The benchmarking system focused more on small scale firms because they make up the larger percentage of the Brazilian Construction Industry both in output and number of establishments. The "Building Innovation Research Unit (NORIE) of the Federal University of Rio Grande do Sul (UFRGS) together with the Association of Building Contractors of the State of Rio

Grande do Sul (SINDUSCON/RS) with the support of the National Council for Scientific and Technological Development (CNPq)" came up a more recent initiative for the Brazilian Construction Industry which was termed SISIND-NET project with focus on implementing measurement of performance system which the initial project only succeeded in propagating its concepts, practices and principles. The SISIND-NET project came up with ideas such as setting up a web-based tutorial for performance measurement trainings and also promoted workshops/training courses that facilitated dissemination and implementation of performance measurement across the Brazilian Construction Industry. The SISIND-NET project came up with the following set of indicators for performance measurement in the Brazilian Construction Industry: Cost, Plan, Time, Sales, Client and Product quality, Supply, Construction Product Quality, Safety, People Involved and Quality Management System (Formoso and Lantelme, 2000; Costa and Formoso, 2003; Taticchi, Tonelli, and Cagnazzo, 2010).

Department of Public Works and the Construction Industry Development Board (CIDB) with the assistance of the Centre for Scientific and Industrial Research (CSIR) developed the Construction Industry Indicators (CIIs) for the South African Construction Industry which are being reported yearly since 2003. The CIIs are aimed at monitoring the development needs and trends in the South African Construction Industry; keeping the industry participants and stakeholders informed about key performance factors; and facilitate project and company benchmarking. The CIIs consist of five categories of indicators which are based on the annual report carried out on construction projects executed during the year on review. The categories are client satisfaction, contractor satisfaction, economic indicators, procurement indicators, health and safety. Some category has sub-categories which are used in measuring performance in the South African Construction Industry. "Client satisfaction is measured on performance of agent/consultant team; performance of contractor; construction schedule; quality of work delivered; resolution of defects; and level of defects. Contractor satisfaction is measured on performance of client; quality of tender documents and specifications; and management of variation orders. Economic indicators are measured on profitability; payment of contractors; and payment of client's agents/consultants. Procurement indicators are measured based on general conditions of contract and adjudication of tenders while Health and Safety of all project participants are considered for Health and Safety indicator" (Marx, 2014; CIDB, 2016).

Lessons Learnt and Benefits of Performance Benchmarking System

From the performance benchmarking systems reviewed above, it was learnt that for effective evaluation of performance benchmarking systems, a club/forum needs to be put in place known mostly as benchmarking club. These clubs are peculiar to benchmarking systems of the construction industries reviewed and comprises of construction industry professionals and stakeholders who partake and assist in decision making procedures (Lantelme et al., 2001; Costa and Formoso, 2003; Costa et al., 2006; CII, 2018; Constructing Excellence, 2010). In implementing performance benchmarking systems in these construction industries, there are some problems encountered among which are: most of the systems do not consider suppliers' input as part of the construction stakeholders and therefore do not evaluate their performance (Beatham et al., 2004); Some systems use lagging measures in evaluating performance (Beatham et al., 2004; Costa et al., 2006); Lack of corporate

commitment to benchmarking club/forum by organisations and firms (Costa et al., 2006; CII, 2018); Little use of performance indicator measures and ineffective communication/dissemination of result of analysis (Costa and Formoso, 2003).

Benefits derived from performance benchmarking systems among others are: it gives room for evaluating the impact of present interventions by government and stakeholders of the construction industry for quick and timely execution of development programmes, strategies and reviewed legislation which will make the industry grow (Marx, 2014); It focuses improvement efforts on issues that are critical to success of the industry (Construction Excellence, 2010); It gives guarantee that improvement targets are coined out from the achievements from practice in the industry (Construction Excellence, 2010; Marx, 2014); It gives room for the exchange of ideas among construction professionals and provide the environment for meeting to deliberate on best practice measures thereby coming up with improvements (Costa et al., 2006).

Performance Measurement in the Nigerian Construction Industry

Christiana (2008) submitted that the Nigerian Construction industry needs to take performance measurement seriously and the Government needs to formulate policies on Performance Measurement practice while setting up departments that will be in charge of bringing in global trends and making sure the industry adopts them. Christiana (2008) stressed further that there should be a general awareness and orientation on the importance of implementing performance measurement within the Nigerian Construction Industry. It was concluded that most construction firms have interest in knowing their performance and actually measure their performance. Although few of the construction firms have performance measurement concepts knowledge, they mostly engage in using traditional performance measures (which has been highly criticised). Only few construction firms adopted the use of non-traditional performance measures.

In view of these submissions, it is therefore imperative that the Nigerian Government formulate policies on benchmarking to evaluate performance of the Construction Industry by taking knowledge from international experiences of KPA, CII BM&M, NBS, SISIND-NET and CIIs. In order to achieve the objective of this study, some qualities a performance measurement system ought to have as outlined by Tangen (2004) was crosschecked which are: it must support strategic objectives; it must guide against sub-optimization; it must consist of performance measures that has comprehensive specification; and it must be easily accessible with limited number of measures. To this end, the performance measurement indicators shown in Table 1 are proposed for the Nigerian construction industry at the different stages of construction based on the reviewed performance benchmarking systems of construction industries.

CONCLUSION

It is no gainsaying that performance benchmarking system has helped businesses with the construction industry not an exception. Over the years, developed countries has implemented performance measurement into their construction industry to encourage competitiveness. This in turn has benefited the construction industry with the evolvement of best industry practices. This has also enabled

government policies be fashioned into assisting the activities of the industry be driven towards ensuring best practice is ensured in all facets.

Table 1: Proposed Performance Indicators for Stakeholders in the Nigerian Construction Industry

Client	Consultant	Contractor	Supplier
PROCUREMENT STAGE - PERFORMANCE			
Project attribution Procurement & delivery Strategy Project viability Contractual arrangement Briefing Process Communication Decision effectiveness Risks and opportunities Excessive bureaucracy Social Obligations	Project management capabilities Good working relationship Competency Consultation mode Commitment Strategic cost advise Meeting functional requirements Meeting technical specification Proper communication Interactive process Efficiency of technical approval authorities	Level of experience Financial stability & financial management Past performance Management capabilities Performance of project personnel Construction method and technology Manpower and technical capabilities Project innovation	Quality assurance on products Quality control system Product life span Replacement value Product mechanisation Track record Level of service Team turn-over rate Capabilities of key personnel Top management support
PROJECT PHASE - PERFORMANCE			
Management structure Project interfaces Fragmentation Conflicts Control measures Political, economic, social legal & environment influences Loyalty Quality of work life	Team Management Project interfaces Coordination Accountability Conflicts management style Communications and reporting Quality control system Quality assurance Dispute resolution process	Performance standard Good working relationship Construction method & technology Labour utilisation & relaxation Productivity rate Safety Communications and reporting Cost control mechanism Efficiency	Material Procurement Co-operation Commitment Coordination Ability to deliver Product reliability Delivery time Contractual agreement Product defects
PHASING-OUT STAGE - EXPECTATION			
Meets pre stated objectives Meets time Meets budget Technical specification Acceptable quality Meets Corporate prioritie Absence of any claims & proceedings Transfer of experience Investment opportunity Value for money	Profitability Future Jobs Learning & growth Generated positive reputation Harmony Absence of any legal claims & proceedings Increase the level of professional	Profitability Achieve business purpose (strategically, tactically & operationally) Learning and growth Settlements of conflicts Minimum risk (reduction of disputes) Business relationship New market penetration Generated positive reputation Develop new knowledge & expertise	New market penetration on products Future potential Exploit technology Profitability

Adapted from: Lantelme et al.,. 2001; Takim and Akintoye, 2002; Beatham et al., 2004; Costa et al., 2006; Constructing Excellence, 2010; CII, 2018

The Nigerian construction industry in a bid to level up with the global trends need to adopt performance measurement system by setting up a body to oversee the dissemination, evaluation and implementation of performance measurement. To achieve success, a clear understanding of performance which needs to be improved, and why it should be improved must be established; Careful selection of who to benchmark against must be carried out; The reasons for any difference

in performance must be well researched; Goals and targets must be established which are both challenging and achievable once effort is put into it; There must be willingness to implement the benchmarking findings.

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