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# APPLICABILITY OF EXISTING PERFORMANCE EVALUATION TOOLS AND CONCEPTS TO THE NIGERIAN FACILITIES MANAGEMENT PRACTICE

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**ABSTRACT.** There are noticeable gaps in aspects of Nigerian facilities management (FM) education and practice. Predicated by its relative infancy, one area where this gap is more apparent is in the measurement of performance. This paper is a systematic review of at least 22 performance measurement (PM) tools and concepts that are known and in use for assessment of performance of buildings / facilities and or performance of FM as a management process. Based on the literature, the research examined the essential features, strengths and weaknesses of each method generally and their specific applicability to the Nigerian environment, in view of her peculiarities as a developing nation. It also discusses the required attributes of a PM tool that will be applicable to FM in Nigeria. A major contribution of the study is the development of a table that presents a summary of the information on the tools or concepts at a glance. The paper is an extract from an ongoing PhD research; although it does not include details of the empirical survey, it nevertheless provides background work for a possible attempt at developing a PM tool that will be contextual and applicable to the measurement of building performance and effectiveness of facilities managers in the Nigerian FM practice and by extension, to most parts of the developing world.

**KEYWORDS:** Building performance; Facilities management; Nigeria; Performance measurement tools; Performance of facilities manager

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## 1. INTRODUCTION

A wide gap persists between the expectations of building users and the quality of services provided by practitioners towards the fulfillment of these expectations. The lack of objective quantification of user requirements and expectations has been identified as one important reason for this gap (Augenbroe and Park, 2005). The availability of appropriate performance measurement (PM) tools is therefore important in bridging this gap and invariably in the successful delivery of buildings.

Performance measurement can be defined as the act of ascertaining the extent to which a process has performed its function by comparison with a known standard (McDougall et al., 2002). It is a critical element of strategic planning, quality improvement programs, service excellence and results based budgeting systems (Nelson and Moss, 2005). The emergence of Building PM can be traced back to the work done by the Building Performance Research unit in Strathclyde University, Glasgow between 1967 and 1971 to appraise secondary school buildings. This research remains possibly the most in-depth investigation of its kind (McDougall et al., 2002). Building PM provides the essential information that is required in the monitoring and control of the building delivery process. It also demonstrates the value of FM to businesses thereby enabling the practitioners attain strategic roles in organisations.

Studies have indicated that FM supports core businesses by creating conducive working environments, but the ability to do this varies with local conditions and contexts (Tuomela and Puhto, 2001; Chotipanich, 2004). Invariably, the appropriateness of PM tools will vary with the different cultures and local conditions. For example, Asian building performance standards have been found to be lower than that of most parts of Northern Europe (Wong, 2000; Chotipanich, 2004). Therefore, it will be inappropriate and impracticable to adopt benchmark data from United Kingdom for building performance evaluation in Asia and impliedly for a developing country like Nigeria. It is also recognized that there are little or no known accurate and systematically developed benchmark data in Nigeria that can be utilized in performance comparisons (Adewunmi et al., 2008).

Most of the existing PM tools require well developed information and communication technology (ICT) systems. Nigeria came late and slowly into the use of ICT, she is therefore yet to fully commit to ICT integration (Adeosun, 2010). In fact, in 2007, it was indicated that Nigeria possesses the lowest tele-density in sub-Saharan Africa in spite of the spate of growth experienced between 2002 and 2006 (Akpan-Obong, 2007). Consequently, the use of ICT particularly in the area of data processing and management is still limited, as people continue to depend on traditional ways for planning, research and business management. Some of the reasons adduced for this low integration and diffusion of ICT in Nigeria are poor physical infrastructure particularly with respect to irregular power supply, poor funding, lack of political will and commitment by government and other stakeholders, low data network connectivity, inadequacies of available software, non-availability of profession specific software, high cost of applications and software, mismatch of models from the developed world, obsolescence of computer software and hardware and high cost of hardware (Adeosun, 2010; Apanpa and Lawal, 2009; Kuteyi, 2009). Other reasons are, low level of competency and skill of users, fear and anxiety towards ICT use, cultural factors and different concept and value system (Adeyinka, 2009; Apulu and Latham, 2009) The implication of these studies for measurement of performance of FM in Nigeria is that, PM tools which require sophisticated data analysis and management processes that are achievable only through high level adoption of ICT may not be applicable or easily adaptable in the Nigerian context.

Another major issue for the applicability of PM tools for building support service in Nigeria is poor disclosure of information by stakeholders in the corporate environment and poor reliability and inaccuracies of disclosed information, particularly financial disclosures (Ali et al., 2004; Games, 2011; Umoren 2008; Wallace, 1988). Some of the identified reasons for the poor disclosures include; fear of discovery of financial impropriations and acts of corruption, fear of competitiveness, inappropriate and non-commensurate sanctions for non-disclosure and provision of misleading information. Others are the culture of not making time to provide information unless there is immediate financial gain in sight and inability of company shareholders and stakeholders to insist that company executives disclose financial information (Ali et al., 2004; Umoren, 2008).

With such laisser-faire attitude to mandatory disclosures, the implication for the more voluntary disclosures such as level of facilities performance can only be imagined. Undoubtedly, this attitude cannot aid research considering that research thrives on availability of information.

Impliedly, PM tools that rely on extensive and reliable corporate information disclosure, systematically collated benchmark data, good infrastructure and sophisticated hard and software for analysis of information, may be difficult to adopt in the current Nigerian practice. PM tools with features that are mismatched within the context of the environment are incapable of bridging the gap between users' needs and expectation and could actually hinder the successful delivery of the building process. The foregoing issues make it necessary to examine the applicability of existing building support PM tools in the Nigerian context. The aim of this study is therefore to examine according to literature, the essential features, strengths and weaknesses, of some of the already developed FM performance measurement tools and conceptual tools used in practice, generally and the specific limitations to their application in Nigeria. This is with a view to identifying the important attributes of a typical PM tool for buildings and FM that will be applicable in Nigeria, for its academic import and for its usefulness in improving the efficiency of FM practice in the country.

## 2. THE ESSENCE OF PERFORMANCE MEASUREMENT

One of the important steps towards improving performance is to establish the quality of what is available or has been provided and this can only be done through measurement of performance. To put this into perspective, Varcoe (1996) stated that "what gets measured gets done". Similarly Teicholz (2003) asserts that "you cannot improve what you cannot measure. PM improves the performance of both existing and proposed buildings by identifying the downsides in their performance through measurement. It helps to identify chronic occupants' problems and required areas of improvement in services. PM indicates ways to improve effectiveness of facilities managers by providing simple ways of achieving user requirements with minimal efforts and costs and assists the process of resource allocation and re-allocation. Furthermore, it indicates if, when and where a building's support system starts to become burdensome to its management and the possible causes and solutions to this problem (Bordas et al., 2001).

Performance measurement in FM is useful in numerous other ways. It creates solutions to problems in the work environment from the perspectives of the user, rather than as dictated by the fragmented structure and thinking of the building industry professionals (Alexander, 2008). This streamlines and improves the focus of these solutions, thereby making the industry more customer friendly. Measurement of performance helps facility managers identify legislative requirements that are yet to be met in buildings. It is the surest way to improve the economic, physical and functional performance of buildings and to ensure that they meet specified objectives.

## 3. METHOD OF RESEARCH

This research is based on documentary analysis also known as Meta-analysis (Redestam and Newton, 2001). The study adopts a systematic review of past work and literature on performance measurement tools. The data for the research were obtained from secondary sources such as journal articles, conference proceedings and papers as well as relevant textbooks. This enabled the researchers to evaluate the usefulness and attributes (strengths and weaknesses) of various PM tools that have been developed and examined by authors that are knowledgeable in these areas, particularly in countries where the practice of FM and performance measurement are already well established. The applicability of these tools was then examined vis-à-vis identified features of a typical tool that would be applicable in the Nigerian context according to literature.

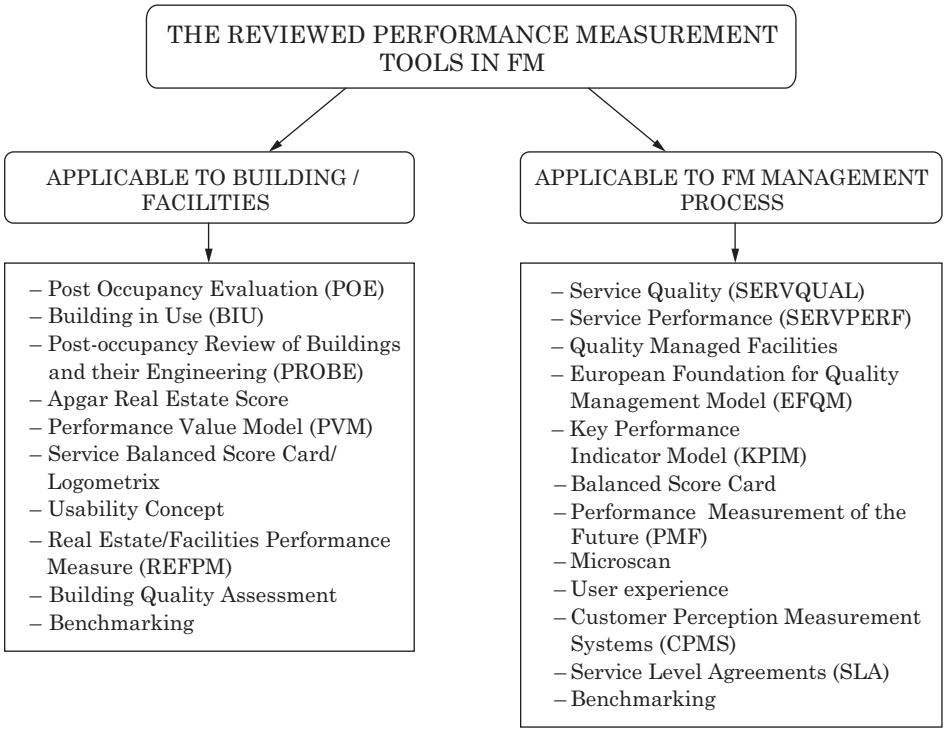


**Figure 1.** The two categories of the reviewed performance measurement tools

A major contribution of this study is a table that was developed from the review of literature on 17 of the 22 featured tools and concepts (Figure 1). It provides readers with general information at a glance, on the essential features, strength and weaknesses of these tools and their specific applicability in Nigeria. The table also specifies the dates and names of the creators of these tools or at least researchers who have worked extensively on them.

## 4. OVERVIEW AND APPLICABILITY OF VARIOUS PM TOOLS

Due to constraints of space, this section provides overview for only the most popular PM tools, although it also covered the newest ones, particularly their evolving features. Further details on some of the tools and concepts examined in the section are provided in summary form in Table 1.

### 4.1. Post Occupancy Evaluation (POE)

POE is a strategic performance evaluation technique that measures performance of building in use against specified standards from the perspective of the user. The method was developed in the 1960's but was adapted and made popular by Preiser who chaired POE committees in 1987 (Preiser and Nasar, 2008). POE could be indicative, investigative or diagnostic in nature. The method is used largely in public organizations and has served as a guide in Corporate Real Estate and facilities decision making. As a diagnostic tool it can be used to indicate where renovations are required, establish maintenance policy and even to select appropriate properties for lease or purchase.

POE is more useful for organizations with recurring construction programmes that require feedback that can be used in their building delivery cycle (Preiser, 1997). Preiser and Nasar (2008) have continued to use POE in case studies including 17 contemporary facilities from around the world using what they referred to as distributed technology. There are ongoing improvements to POE, such as the POE Probe (Post-Occupancy Review of Building and their Engineering Facilities) Project (McDougall et al., 2002).

**Table 1.** Features of the of the performance measurement tools and concepts and their limitations in Nigeria

| Tool or method | Area of application | Author (year) | Essential features | Strength | Weaknesses | Limitations for application in the Nigerian context |
|---|---|---|---|---|---|---|
| Post Occupancy Evaluation (POE) | Building/ facilities | Adapted by Preiser (1997) | Measures performance of buildings against specified performance criteria<br>Relevant in assessing result of a major change, such as improvement, alteration or renovations.<br>Findings are usually adopted in planning of real estate strategy. | – As it measures from user's perspective it helps in identifying users needs.<br>– It is relatively easy to use, once the performance criteria to be used is established. | – More for measurement of success of a change i.e. improvements or adaptation than basic performance.<br>– More relevant to case studies than for general use.<br>– Does not combine financial performance criteria. | – Could be difficult to establish performance criteria against which to evaluate performance in each case. |
| Service Quality (SERVQUAL) | FM management process | Parasuraman et al. (1988) | Adopts gap study i.e. it evaluates Service quality by establishing the gap/difference between the assigned values for the expected quality of the service in comparison with the user's perception of the quality of the service provided. | – It measures from users' perspective thereby helping to identify their needs and required areas of improvement. | – Difficult to establish gap value as a harmonious definition for expectation does not exist yet (Shaw and Haynes, 2004).<br>– Some regard scoring the expected quality of a service as difficult and time wasting. (Cronin and Taylor, 1992; Simpson and Barrett, 1996). | – The idea of establishing quality gap might be too complex for average Nigerian users.<br>– Respondents cooperation for the complex process may be lacking because of poor attitude to information disclosure. |
| Building in Use (BIU) | Building/ facilities | Viscer (1989) | Evaluates office environment and support services.<br>Adopts user's perspectives.<br>Uses seven performance dimensions that are based on 30 ratings. | – Assists in identifying needs of users.<br>– Measures are relatively easy to use.<br>– Examines occupants needs and experiences, within their places of work (Lindholm and Nenonen, 2006). | – More for measurement of success of a change i.e. improvement or adaptation.<br>– More relevant to case studies or and commissioned cases. | – Could be difficult for facilities managers to garner the required support for its use in a case study situation, where this is applicable. |
| Balanced Score Card (BSC) | FM management process | Kaplan and Norton (1996) | Incorporates tangible and non–tangible measures.<br>Attempts to achieve a balance between traditional financial measure and softer customer satisfaction criteria.<br>Adopts four perspectives of finance, customer, learning and growth, and internal business process. | – More versatile for measuring the value of FM as it adopts a combination of hard financial and soft user measure perspectives. | – Difficult to device a set of Indices that will be linked to individual organizations' strategy.<br>– Multiplicity of measures is sometimes confusing to users.<br>– Captures peculiar organizational issues.<br>– Adopts management (administration) opinion of performance objectives instead of users'. | – Infancy of FM and socio–cultural situations in Nigeria presents additional difficulties in devising a set of indices that will be linked to Individual organisations' strategy.<br>–There could also be difficulties with handling the confusion emanating from the multiple measures.<br>– Financial measures aspects of the tool could be difficult to use because of poor financial disclosures. |

(Continued)

| Tool or method | Area of application | Author (year) | Essential features | Strength | Weaknesses | Limitations for application in the Nigerian context |
|---|---|---|---|---|---|---|
| (Continued) | | | | | | |
| Service Performance (SERVPERF) | FM management process | Cronin and Taylor (1992 | Developed in response to the difficulties of using SERVQUAL. It is also a service quality measure. Unlike SERVQUAL it measures quality of a service from users' perception rather than estimate of gap between expectation and perception. | – Assists in identifying needs of users. – Measures are much easier to use than in SERVQUAL. | – Concentrates only on physical environmental measures. – Also, it does not utilize financial performance criteria in combination | – Limited to only physical environment dimensions of office performance, to the neglect of more process and user support related measures. |
| Quality Managed Facilities | FM management process | Alexander (1992) | In measuring performance, it examines how business drivers are linked with strategic objectives of organisations. It uses a matrix that was developed through a series of events (Moss et al., 2004). Uses nine hard and soft strategic business drivers, made up of three input categories or organizational objectives of adaptability, performance and image drivers, while its output is categorized under quality, value and risk issues. | – It enables users to build the required link between strategy and performance, by linking operational measures with strategic objectives through use of KPIs. – It is a performance improvement process that addresses needs of users, by creating dialog among all stakeholders. –The application of the model is being continuously enhanced through collaborative researches (Moss et al., 2007). | – The tool has only been adapted to case studies; this limits its general application. – It could be difficult for users to device KPIs that will be suitable to the individual organization's objective. | – Intensive ICT adoption may be required for incorporating the individual organization's strategy perspective. Hence Low level ICT integration in Nigeria could limit its use. – It may be difficult to garner the type of support that facilities managers require for its use, in view of its strategic content and information disclosure requirements. –Multiplicity of measures is likely to make it complex and confusing to use. |
| Post–occupancy Review of Buildings and their Engineering (PROBE) | Building/ facilities | Bordass et al. (2001) | Measures performance from user perspective using category indices of comfort and satisfaction, on a scale of 1 to 7. 1 is for uncomfortable and 7 for comfortable. Comfort is rated from temperature, air quality, noise etc., while satisfaction is measured from design needs, productivity and health perspectives. Scores for each variable in each building is based on averages of the occupant's responses. | – Helpful for identifying users' needs. – Relatively easy to adopt. – Does not require complex calculations or use of complex computer software. | – Restricted to commissioned cases and adapted for case studies. – The sampling frame of the research that engineered the tool was not randomly selected. – Does not incorporate financial measures. – It needs reasonably large samples of building yardsticks to develop benchmarks for comparisons (Bordass and Leaman, 2005). | – Could be difficult to establish performance criteria – Requires a team of highly experienced assessors to use and these are not available in the Nigerian market. – It compares the ratings of the buildings in the case studies with that of benchmarks implying that its use will be limited in view of absence of systematically collected benchmarks in the Nigerian FM market. |
| Apgar Real Estate Score | Building/ facilities | Apgar (1995) | Based on 5 factors i.e. amount, price, grade, area, and risk. Each a composite of relevant measures from a total of 150. Uses a scale of 0 – 2. A composite score of between 0 and 6 out of a maximum score of 10 suggests needs for improvement (Lindholm and Nenonen, 2006). | – Measures in terms of quantity and cost. – Relatively easy to adopt. – Does not require complex calculations or use of complex computer software. | – Focuses on cost and space utilization and ignores other important areas such as users' comfort and satisfaction. | – It is less useful as an average FM performance measurement tool because it focuses on cost and space utilization and ignores other important areas such as users' comfort and satisfaction. |
| | | | | | | (Continued) |

| Tool or method | Area of application | Author (year) | Essential features | Strength | Weaknesses | Limitations for application in the Nigerian context |
|---|---|---|---|---|---|---|
| (Continued) | | | | | | |
| Key Performance Indicator Model (KPIM) | FM management process | Hinks and McNay (1999) | Developed a model of key performance indicators (KPI), in the order of their priority.<br>FM performance value is determined by the aggregate of the measured effect of the KPIs. | – It is easy to measure and to use generally.<br>– The user perspective of its assessment will aid identification of user's needs. | – KPIs will vary with context and time. This implies that this tool could be less useful in a different environment and time frame. | – The developed set of indicators may not be applicable in the Nigerian environment because of socio–cultural differences earlier identified and the infancy of the country's FM practice. |
| Performance Measurement of the Future (PMF) | FM management process | Hinks (2000) | Adapts KPIM by incorporating three additional category indices thereby enabling the model to reflect specific objectives of each organization.<br>From the 3 categories are mode of service delivery, innovation and relevance of services provided.<br>Tagged PM tool of the future. | – Improvement on KPIM.<br>– Attempts to quantify the strategic value adding edge of the FM practice of each organization by relating the developed KPIs to specific organizations objectives. | – Difficulties could be encountered with the use of a measure that requires taking each company's individual objectives into perspective and developing appropriate indices for them. | – May be too sophisticated for use in Nigeria as it requires sophisticated software and deep support of organizational executives to appropriately link KPIM to specific strategic goals of organizations. |
| Building Quality Assessment | Building/ facilities | Isaacs et al. (1993) | Relates actual performance to identified requirement for user groups<br>Uses 138 factors under 9 headings for assessment. First 7 measures level of service, the last 2 how to retain the service.<br>Uses 2 extreme measures, i.e. available or not; but also intermediate conditions.<br>Scale is 0–10 multiplied by weights to reflect the importance of each measure. | – Easy to adopt, in as much as trained assessors are available.<br>– It can be completed quickly in about 2 days (McDougall et al., 2002).<br>– Uses a computerized system capable of indicating service provisions at a glance<br>– Versatile as it allows comparison of overall building performance, category performance and scores at individual factor levels on a common basis. | – Silent on intrinsic value of items being assessed. It only indicates availability or lack of an item or service.<br>– It presents a trained assessor's perspective instead of users. This may not provide room for appropriate identification of user's need.<br>– Scores are to be established by trained assessors only. | – There is absence of trained assessor's in Nigeria. If they become available in future they may be too expensive and assessment could involve some biases.<br>– Requires complex computer calculations to produce the report of findings. |
| Performance Value Model (PVM) | Building/ facilities | Oseland and Willis (2000) | Adopts 3 metrics of performance i.e. quality, cost and time/use.<br>These factors are interrelated and affect one another.<br>The obtained PV value needs to be compared with benchmark data to determine performance. | – Make provisions for enabling organizations to track all three categories of indices separately or jointly. | – Constraint of accuracy of data by way of time and cost of collecting it, particularly data on down time.<br>– Also difficulty with obtaining systematically developed benchmark data | – Lack of systematically developed and contextual benchmarks and poor financial disclosure will reduce applicability to Nigeria.<br>– The measurement of the time/use category is too complex to use. |
| Service Balanced Score Card (SBSC) and Logometrix | FM management process | Brackertz and Kenley (2002) | Both variations of the BSC, but specially designed for use in public service properties, particularly local government authority area's (LGA) where the focus is not profitability.<br>As in BSC, it measures from four perspectives. However, it uses stakeholders' opinion in determining performance objectives rather than management opinion as applicable in BSC. | – More versatile for measuring the value of FM as it adopts a combination of hard, financial and soft user measurement perspectives.<br>– Specially adapted for measuring FM performance in non–profit making facilities. | – Limited application in view of its special adaptation to public service facilities, particularly facilities belonging to LGA.<br>– Ultimate score for the facilities being measured have to be compared with benchmarks to determine performance. | – Use is likely to be fraught with great difficulties with regards development of ratings of the measures.<br>– Additional difficulties with developing average ratings (benchmarks) of similar facilities for performance comparisons.<br>– Both problems stem from poor attitude to research and management of public asset. in Nigeria. |

(Continued)

| Tool or method | Area of application | Author (year) | Essential features | Strength | Weaknesses | Limitations for application in the Nigerian context |
|---|---|---|---|---|---|---|
| (Continued) | | | | | | |
| Microscan | FM management process | Atkins and Brooks (2000) | Adapts BSC & benchmarking ideologies. Therefore it is based on 4 perspectives of finance, customer, innovation and processes. It utilizes a set of 80–100 questions that covers the above four perspectives. | – Combines financial and non–financial measures. – It helps to identify development targets, and areas of improvements by showing the balance between the four perspectives of performance it features. | – Multiplicity of measures could be confusing to users. | – Could be too sophisticated for use in Nigeria, particularly as the tool requires Sophisticated software and extensive support of organizational executives to use. |
| Customer Perception Measurement Systems (CPMS) | FM management process | Tucker and Pitt (2008) | Developed in the contention that conventional performance measures lay more emphasis on service delivery performance to the detriment of customer satisfaction measures. It commences with the gathering of a national benchmark data of customer needs followed by FM provider's performance measurement and lastly the gap between these two. | – Focuses on customer satisfaction factors which aids identification of users' needs. – It adopt a continuous improvement process and identify trends between key variables of criticality, efficiency and service provisions. – Measures from three perspectives of workspace comfort, workspace resources and on–site services. | – Difficulty of accurately gathering required benchmark data, particularly in view of required cost and time of this process. – Use timely observation in determining down time (say every 30 minutes to 1 hour over a period of days). This is usually only possible with a case study in a collaborative effort with a client. | – In Nigeria, the difficulty in gathering accurate benchmark data as required is more pertinent; particularly in view of the required cost and time and the inadequacy of research infrastructure. – Determining intensity of use of facilities and down time will be difficult due to aversion to research by organizational executives. |
| Service Level Agreements (SLA) | FM management process | Not Available | Measures performance by comparing quality of service provided with what is stated in the service agreements made with clients. Service agreements are contract documents that guide the expectations of clients in service contracts. Many view it as merely a contract Document, although few authors such as Simpson and Barrett (1996) and Nelson and Moss (2005) described it as a PM tool. | – Easy to measure, as all that is required is a comparison of performance with the criteria provided in the SLA. – Focuses on customer satisfaction factors. | – The terms of the agreement could be difficult to draft and it could neglect softer aspects of quality. – SLAs are operational indicators; not critical success measures. – SLA's are less generally applicable. Besides different operative could be applicable for different service providers within the same organisation. The resulting inequality & confusion, could impact on efficiency (Moss et al., 2007). | – A good quality service agreement that will take good cognizance of user's requirements may be more difficult to develop in Nigeria than in most other places. This is due to the infancy of its FM & relative in–experience of the service providers. |
| Real Estate/Facilities Performance Measure (REFPM) | Building/ facilities | Lindholm and Levaänen (2006) | Based on the idea of Microscan, POE and BIU. It adopts tangible and non–tangible measures. It provides a list of potential performance measures for corporate real estate managers to select from in creating a personalized PM system that fits the firm's real estate strategies and information availability. | – It attempts to measure performance from the perspectives of each company's specific organizational objectives using personalized PM system. | – It is not of general application as the strategy or perspective to be measured would depend on each company's specific objectives. | – A facilities manager must occupy a strategic role in his organization to be able adopt this tool, in view of the financial and non–financial support it requires (Simpson and Barrett, 1996). This is difficult to achieve within the Nigerian FM practice. Although, a number of the potential performance indicators from this model could be useful in the country. |

### 4.2. Service Quality (SERVQUAL)

This is appropriately a method for measuring the quality of a service. It was developed by Parasuraman et al. (1988). The tool adopts gap analysis techniques. That is, it measures performance by establishing the difference between the assigned values of the quality of the required service (expectation) and that of the service provided from the user's perspective (perception). In spite of identified difficulties of gap studies researchers continue to use it in different forms to determine performance in FM. It was used by Pinder et al. (2003) cited in Clark et al. (2004) and Tucker and Pitt (2008).

### 4.3. Service Performance (SERVPERF)

This is quite similar to SERVQUAL and was developed by Cronin and Taylor (1992) in response to the difficulties that respondents encountered in the use of the SERVQUAL method. The name SERVPERF is actually an acronym for service performance. The method has been found to be easier to use than SERVQUAL because it does not require measuring users' expectations for a service; only perception on quality (Simpson and Barrett, 1996).

### 4.4. Hinks and McNay's (1999) Key Performance Indicator Model (KPIM)

This tool is also known as management by variance tool; its main contribution is in the development of a model of key performance indicators. The ultimate FM performance value is determined by the aggregate of the measured effect of these individual factors.

KPIs are general indicators of performance that focus on critical aspects of output or outcomes. The management by variance tool supports a structured creation of a custom list of KPIs of mutual interests to FM providers and customer (Byrne, 2011). In this respect, it was used in Moss et al. (2007) to develop a specific set of KPIs for a central government department in the UK, while Lam et al. (2010) developed the project success index (PSI) a KPI type set of indices for benchmarking performance of building maintenance projects. KPI is identified as the most popular performance evaluation model in construction and FM practice and was considered quite effective for performance evaluation by respondents in a study in Europe (Meng and Minogue, 2011). Hinks (2000) did some further work on this earlier study which made suggestions on how to improve the reliability of the earlier model. The new tool that emerged from this work was referred to as performance measurement of the future.

### 4.5. The Balanced Score Card (BSC)

This tool was developed by Kaplan and Norton (1996). BSC is a strategic method which recognizes and reflects organisational strategy and objectives into its processes (Lindholm and Nenonen, 2006). The method integrates both the operational and financial measures into four perspectives of performance as indicated in Figure 2.

An essential attribute of the approach is that it encompasses four perspectives which permit a balance between; short-term and long-term objectives; desired outcomes and the performance drivers of those outcomes and the softer more subjective measures. This attribute is the special strength of this tool and it is what earned it the name "balanced score card" (Amaratunga et al., 2000).

### 4.6. Usability concept

Usability has been in existence in the information and computer technology industry since the 1950s. It is however less than a decade in the construction industry (Blakstad et al., 2008). Therefore, the full terms of the concept and its method of adoption are still undergoing modifications. Usability concept is being currently reviewed by a collaboration of research teams from nine countries, together with their industrial partners. Its development was necessitated by perceived deficiency in conventional building performance evaluation tools. These earlier tools were said to focus on technical, functional and operational aspects of facilities (Blakstad et al., 2008). Majority of conventional evaluation methodologies, particularly POE and PFE methods and tools, fail to

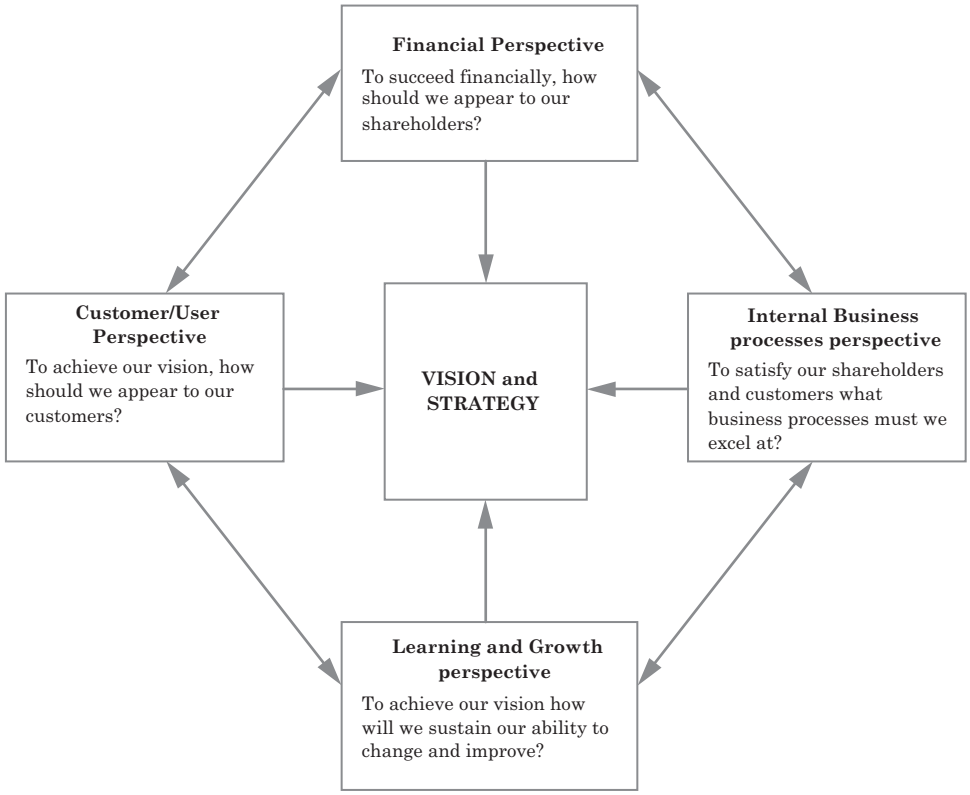


**Figure 2.** Different segments of the balanced scorecard
*Source*: Kaplan and Norton (1996)

address strategic objectives, consider buildings out of context and tend to focus on the characteristics and performance of the physical environment, rather than on the effects on users and on benefits realization (Alexander, 2010).

Usability takes cognizance of the cultural context of facilities in terms of their contribution towards social development of the community in which they are located. The concept measures from the perspectives of effectiveness, efficiency and satisfaction and uses qualitative measures such as interviews and walk-throughs which may reveal many building deficiencies that could have been ignored by a survey (Alexander, 2010).

An inherent difficulty in the use of this concept in Nigeria is that the relevant qualitative tools are difficult to use. Furthermore, there is absence of multi- professional teams (in the Nigerian FM practice) that are trained to read accurate meanings into the interviews.

### 4.7. User experience

Usability concept appears to have given rise to a more recent but similar concept i.e. "user experience" which includes wider human experience dimensions, such as pleasure, fun and human experience (Nenonen et al., 2008). Walkthrough is the most common evaluation method for user experience in usability. The walkthrough technique involves inspection tour of the building with selected users (with designated stops) in order to gather their experience in relation to the relevant topic. The biggest advantage of the walkthrough method is the attainment of contextual knowledge of how various solutions work and to avoid reproducing bad solutions from one project to the other.

Hansen et al. (2011) used the walkthrough technique in evaluating user experience in case study action researches in Norway. From these researches they were able to come up

with a proposal for a walkthrough design within a framework they named the USEtool. Greater details on the use of this tool are provided in Hansen et al. (2011). Blakstad et al. (2010) attempt to operationalise the relation of usability to effectiveness in the USEtool by developing a structured framework which combined the recognized methods of usability evaluation as walkthrough, interview and workshop with process description and easy to use guidelines. This should enable trained FM or user representative to use the tool. A major weakness of the concept is that it requires the use of ethnological studies to aid identification and development of relevant and widely acceptable social anthropological tools that will measure user's experience; although these are evolving gradually. This makes the method too complex for use in Nigeria.

### 4.8. Benchmarking

Bottom (2003) defined benchmarking as a process of comparing a produce, service process, an activity or object with samples from a peer group with a view to identifying best buy or best practice and targeting oneself to emulate it. It adopts historic accurate performance data against which the data under survey can be compared.

Benchmarking is one of the foundations of both Total Quality Management (TQM) and Continuous Quality Improvement (Lindholm and Nenonen, 2006). Benchmark data are obtained from companies believed to be top competitors in the industry. It is important to ensure that benchmarking is done on similar parameters. Williams (2011) explained that it is not sufficient that the parameters are similar they must be adjusted using the plethora of variable resource drivers such as scope of service, shape and density of building, intensity of use, accessibility, service levels etc. Inappropriateness and inconsistency of parameters and inadequate adjustments for the effect of these resource drivers creates failures for benchmarking (Bottom, 2003; Williams, 2011). It is also important to understand that benchmarking is capable of indicating need for financial control but not the nature and scope of the specific improvement. Some of the identified difficulties with the application of this method in Nigeria is the absence of systematically developed benchmark data. This is exacerbated by the poorly developed infrastructure for research and the time and cost of gathering data for benchmarking.

Benchmarking is not merely a measurement and comparison technique; it is equally recognized as a business improvement tool that uses performance criteria among other measurements (Oseland and Willis, 2000; Bottom, 2003). This recognition has attracted several collaborative research and investigative studies, that has led to development of benchmark data such as, PROBE service, Construct IT British Quality Foundation independent project analysis (private), Bernard Williams Associates, *Estatesmaster* (private), AGILE Construction Initiative, and in the US, IFMA benchmark data and National Institute of Building Sciences benchmark for facility performance.

### 4.9. European Foundation for Quality Management (EFQM) or Business Excellence Model (BEM)

This is a tool for self-assessment that also serves as a veritable tool for benchmarking against other organizations. EFQM serves as a guide in identifying areas where improvements are required. This tool has the concept of excellence and adoption of outstanding practice at its heart (Robinson et al., 2005). EFQM encourages organizations to emphasize cultural and processes issues. It encourages people to tap into intangible assets and empower them to maximize their potentials. EFQM describes a cause and effect relationship between enablers and result of business processes within an organization (Meng and Minogue, 2011). The tool uses both financial and non-financial perspectives as with the BSC, using 9 major criteria. Five of these criteria are enablers which covers what the organization does, while the remaining four criteria are the results or what the organization achieves (EFQM, 2011).

EFQM is the third most commonly used performance model in the UK and many simi-

lar models have been developed from its concept (Meng and Minogue, 2011). A recognized weakness of the method is that it could be difficult to device comprehensive performance measures that will be linked to individual organization's strategy; particularly as this could require intensive ICT usage, making it too complex for use in Nigeria. Infancy of the FM practice could also make it impossible for practitioners to garner required cooperation to use it in the country. Table 1, summarizes the details of most of the PM tools that were examined in this paper.

The list of tools in this study is not exhaustive, as a paper of this nature cannot exhaustively examine all the tools of performance measurement that have ever been developed. Some of the tools that were not examined include, Quality Assurance and Total Quality Management (TQM) discussed in Robinson et al. (2005). Others are, Performance Map, Serviceability Tools and Methods (STM), Customer journey (Nenonen et al., 2008), Fishbein Expectancy Value Model and Soft Landing (Way and Bordass, 2005). Incidentally, some of the tools that were left out are largely related to those that are examined in this paper. For example PVM evolved from performance Map and TQM which itself is related to Quality Assurance. Benchmarking is said to be the foundation of TQM and Quality Improvement, Customer journey is linked to Usability and User Experience concepts, while Soft Landing is related to POE and PROBE.

## 5. RECOMMENDATIONS TOWARDS AN IDEAL MEASURE FOR NIGERIA

An ideal measure for evaluating performance of FM in Nigeria must adopt the balanced nature of the BSC by combining the financial perspective of the traditional methods with the more modern softer perspective of user comfort and satisfaction and should reflect the Nigerian economic, social-cultural situations and performance standards. In view of the relative low level of technological advancement and ICT integration in the country the appropriate performance evaluation tool must be devoid of sophisticated technological inputs that are associated with a need to reflect strategic objectives of the company in quantifiable terms and must not utilize too many measures. The ideal PM tool must be generally applicable and should incorporate both quantitative and qualitative processes. In other words, it should not be strictly for case study application or restricted to qualitative process such as walkthroughs and interview which could sometimes be quite difficult to use in Nigeria because of poor attitude to information disclosure and the operator status of the facilities manager. As predicated by the relative infancy of its FM, the Nigerian PM tool should not necessarily require the facilities manager to perform a strategic role or occupy particularly high positions in the organizational hierarchy for him to garner required support to use the tool.

Davies and Walters' (2000) focused on crises and national/international uncertainties that could impact on the building industry and invariably the FM practice of nations. Nigeria, like many other nations is typically fraught with uncertainties and irregularities, which results in numerous crises. Examples of these situations include intermittent power outages and surges which could precipitate fire outbreaks and breakdown of equipment, shortages of public mains water supply, weather variations and unpredictable traffic conditions and its associated "African time" effect (poor time keeping). Others are ineffective national standardization policy and monitoring; with associated difficulties for hiring qualified artisans and sourcing for reliable and standardized equipment/fittings all of which also results in the frequent breakdown of machinery and equipment etc. In view of the aforementioned issues, "crises response and management" criteria is considered a major success factor for FM in Nigeria and this perspective rather than be subsumed under other factors such as quality or satisfaction must be provided for specifically as an additional dimension in the ideal measure. In other words to do well in the Nigerian situation, an FM provider must have adequate crisis/uncertainties response and management strategies in place.

The proposed tool will essentially, be a variation of the performance value model (PVM) of Oseland and Willis (2000). As with the PVM it will use three category indices and will reflect the Nigerian economic and social situation by taking out the time/use index in the performance value model and replacing it by a new one the "crises response and management" category index. The importance of this third category has been discussed. In other words, the concept adopts quality of service, financial i.e. value for money and response to crises indices. The time/use index in the PVM was removed because it was found to comprise a number of factors that were either irrelevant or very difficult to measure in the Nigerian context.

Performance value will be determined by the aggregate of the measured effect of the category indices. This tool will generate performance ratings that do not have to be compared with a benchmark data. The obtained mean value for performance gives an idea of the building's performance. To this effect and as in Apgar real estate score a composite mean score of three (3) and above is considered as somewhat good performance while 4 and above is good performance. The closer this value is to 5 the better the performance. This is supposed to be a special strength of this framework, particularly for the Nigerian situation where systematically developed benchmark data are difficult to come by.

The mean scores for the individual measures and the three categories of measures can also be obtained. These scores will indicate those service areas that are being most satisfactorily performed and those that are not. For instance anyone with a score that is less than three (3) will require immediate attention. The individual variables within each of the three categories will be obtained from literature such as Lindholm and Nenonen, (2006), Bordass and Leaman (2005), and Hinks and McNay (1999). The relevance of these variables will be improved through interview with some FM practitioners in the field and those in the academia and also through discussions with a focus group of PhD students.

## 6. CONCLUSION

The way FM supports core business varies with local conditions and traditions. Expectedly, the appropriateness of performance measurement tools will be context bound. It is in view of this that this study examines the applicability of some of the already developed performance measurement tools to FM in a developing country like Nigeria.

The study reveals that the use of tools such as Benchmarking requires the establishment of standards of measurements and benchmark data. In Nigeria currently, there are few known systematically established benchmark data that could be utilized in comparisons and adopting benchmark data across countries is unrealistic because expectation and performance standards differs across cultures. This makes Benchmarking and other tools that require comparison with benchmarks such as PVM, CPMS, BQA, etc. unsuitable as a PM tool in the Nigerian context. POE and BIU are more for accessing success of a major change or improvement and not typically for measuring service quality. This factor makes them less generally applicable. These two tools are in many cases wrongly applied in Nigeria. Service BSC and Logometrix are also less generally applicable as they are more relevant to public service facilities.

According to the study, some of the tools utilize processes that could be quite difficult to adopt in Nigeria because of low level of technological advancement, aversion to research, poor information disclosure among organizations, poor infrastructure and relative infancy of the FM practice. Examples of such tools are BSC, REFPM, BQA, and PMF. Another problem with this category of tools is that currently most facilities managers do not occupy high positions in the organizational hierarchy. This makes it difficult for them to garner the type of financial and non-financial support that they require in adopting these tools. The performance evaluation tools that are examined in this paper are not exhaustive. In spite of this, the issues that were raised on the limitations and applicability of the examined tools are suf-

ficient indication of the need for the development of new tools of performance evaluation (for buildings and the FM practice) that will eliminate or reduce these inadequacies and will be particularly contextual to the Nigerian socio-economic environment.

The researchers believe that a perception study involving empirical analysis of field data on applicability of the PM tools may currently not provide reliable information and may only become feasible with a more developed FM practice when practitioners become more familiar with the various tools that were examined. Therefore, the research adopts systematic review of literature only. Although this constitutes a limitation, nevertheless the study provides a background for further work in the area of PM in FM, particularly in Nigeria. This paper is an extraction from a broader ongoing research effort, in furtherance of which the researchers aspire to develop a veritable PM tool for the measurement of performance of office buildings from demonstrable influence of the effectiveness of FM practice. It is presumed that this tool will be generally applicable in the Nigerian context and expectedly, in the context of most of the developing world.

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