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ASSESSING THE LEVEL OF ADOPTION OF TQM PRACTICES IN NIGERIAN CONSTRUCTION FIRMS

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Quality and quality management issues are topics that are receiving increasing attention worldwide. Several criticisms of lack of adherence to quality and standards have been directed to the Construction Industry in Nigeria. Organisations that are outcome oriented and are focused on improving products are likely to adopt Total Quality Management (TQM). The aim of this study is to assess the level of six latent variables of TQM practices adopted across construction firms in Nigeria. Profiles of the firms based on 3 criteria; Number of departments, type of construction undertaken by the firms and the turnover of the firms were used to classify the firms. The survey research designwas adopted and questionnaires were distributed to managers and heads of departments of the firms. A sample size of 659 was established, 418 responses representing 63% was analyzed. Descriptive statistics using SPSS version 21 was used to analyze the data collected. The findings are based on the profiles established and the results show that firms studied adopt the six latent TQM practices. The study concluded that construction firms in Nigeria are ready for the adoption and implementation of TQM. The study recommends that there is need for the creation of an entity exclusively responsible for assisting firms in the adoption and implementation of TQM.

Keywords: construction firms, quality management, total quality management

INTRODUCTION

Quality and quality management are topics which have been receiving increasing attention worldwide (Naor, Goldstein, Linderman, & Schroder, 2008). The concept of quality has existed for many years, though, its meaning has changed and evolved over time (Reid & Sanders, 2012). In the early 20th century, quality meant inspecting products to ensure that they met specification. To survive and compete internationally, companies had to make major changes in their quality programs by hiring consultant and initiating quality training programs for their employee, thus bringing about the emergence of a new concept of quality. The new concept of quality builds quality into the process, identifies and correct the causes of quality

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problems. The concept of Total Quality Management (TQM) is becoming more widespread. which is a proactive management approach designed to build quality into the product and process (Reid & Sanders, 2012). In recent years, more and more organisations are working towards TQM (Jaeger & Adair, 2016).

In the global economy, many change and transformational initiatives are being developed to increase effectiveness in organisations, TQM is one of those transformational initiatives and one of the most important management practices that have evolved (Haffar, Al-Karaghouli, & Ghoniem, 2013). TQM is a philosophy, a management approach that emphasizes mutual co-operation, involvement of everyone at every level in the organisations (Baird, Jia, & Reeve, 2011), and improvement in all aspects of the organisation (Calabrese & Corbo, 2015). TQM is aimed at achieving and exceeding customer satisfaction through continuous improvement (Prajogo & McDermott, 2011). Globally, organisations are embracing and implementing the practices of TQM (Ooi, Lin, Tan, & Chong, 2011) because it has been recognized as a means to achieve business performance, competitive advantage and continuous success (Jaca & Psomas, 2015). Organisations that are outcome oriented are expected to focus on improving product and service quality as a means of achieving competitive advantage and such organisations are more likely to implement TQM practices to enhance their quality performance (Anthony, Keung, Knowles, & Gosh, 2002). However, in spite of these claimed benefits, a closer examination of literature shows that implementing TQM has not achieved intended results. According to Gambi & Carpenetti (2013) the problem is not with the TQM concept but the implementation of the practices. Globally, a lot has been done on TQM but not in the construction industry in Nigeria (Okunola & John, 2017) thus this study will assess the level of TQM practices in the construction industry in Nigeria by identifying the TQM practices and examining the TQM practices identified.

LITERATURE REVIEW

Quality can be interpreted differently by individuals (Oakland 2004). In construction, quality is defined by the client based on satisfaction with the product (i.e. completed work), processes and/or services (Harianarian, 2012). TQM concept properly implemented in construction has saved the construction industry from crisis that existed over a period of time (Shusma, 2014; Haupt & Whiteman, 2009). The philosophy of TQM requires that all strategic and operational policies within which construction firms operate are aimed at achieving quality (Amara & Sousa, 2009; Koh & Low, 2010). One of the strengths of quality improvement programmes is the ability to control the work process of management and employees, to recognize their problems, to trace the cause of the problems and to implement effective remedies (Zhang &Lui, 2017; Nukik & Matotek, 2014)

Based on the review of literature, it is necessary to identify factors that contribute to the success of TQM implementation. These factors are considered critical to TQM implementation and are often stressed by TQM researchers (e.g. Makhodoomi, 2018; Flynn & Saladeen, 2016; Nasar, Yahaya &Shorun, 2016; Jaca & Psomas, 2015; Soltai, Javadin & Lui, 2008; Yasin & Alavi, 2007). Globally, TQM studies have been carried out in construction industry establishing the level of awareness (Shushma, 2014), the level of adoption of TQM practices (Chengiz, 2018: Aljahama, 2016). The

Nigerian construction has been associated with poor quality of finished products (Okunola & John, 2017). Researches have been carried out in the subject area in Nigeria, but not specifically focused on the Construction Industry, (Chukwuka 2016; Umar, 2010; Mohammad, 2010) concluded that TQM has not yet attained a satisfactory level in Nigeria, studies by Salami et al (2013), Oguntade, (2015) addressed the challenges of TQM in Nigerian organisations Nigeria and concluded that there is a need to create awareness of the concept. Ringim (2015) evaluated the TQM concept at a national level and recommends the need to assess the level of adoption of TQM practices. Quality practitioners and researchers have put considerable efforts to identify TQM factors that influence the quality of products and services provided by the firms. Recently, concepts in the TQM studies are based on subjective indications and recommendations of the quality gurus. Thus, there is a little consensus on the factors that are critical to the success of the concept. Attempts have been made to scientifically synthesize bases for measuring quality in form of quality awards such as the Deming Prize, the Malcom Baldrige National Quality Award (MBNQA) and the European Foundation for Quality (EFQ) as the most popular ones (Flynn & Saladin, 2016; Aliyu et al, 2018). This study collected the TQM constructs from the MBNQA, these practices have been adopted in previous studies (Zu et al, 2010; Valmohammadi & Roshamir, 2015; Aliyu et al, 2018; Jaca & Psomas, 2015) as a basis for the study. The TQM practices identified are:

TQM Practices

Top management support
Customer focus
Workforce management
Strategic planning
Process management
Measurement analysis

Top management support

Literature places emphasis on the vital role of top management in TQM implementation as a prerequisite for effective and successful implementation (Kantardhieva, 2015; Merih, 2016). This evidence is provided in previous research projects stressing that the role of leadership in TQM successful implementation. Top management takes the center stage and must show strong evidence of commitment for the initiative to be successful (Isaac, & Thomas, 2018; Valmohammadi & Roshamir, 2015). Leadership must emphasize that quality initiatives are not just programmes of the year but a lifelong commitment by the firms to ensuring quality is attained in the products and processes of the firms (Talib, Rahaman & Quresh, 2012). Top management supervises, participates in the planning processes, ensures that policies are adhered to and properly implemented and provides support and motivation for the entire workforce. Leadership is expected to provide a conducive environment for success to be achieved in the proposed quality initiative. According to Das, Kumar & Kumar (2011) and Hokoma, Khan, & Hasan (2010), top management is the basis of TQM in the first instance and the role of leadership cannot be overemphasized as the vision for quality is established by top management. Objectives for performance is also developed by top management.

Customer focus

Quality is defined by the customer; it is centered around the demands of the customers. Customer focus emphasizes on meeting and exceeding customer satisfaction as one of the most important features of TQM and that is also the focus of TQM definition (Talib, Rahaman & Qures, 2012). In any production process, customer is an important element.

Any effective production process is aimed at meeting the needs and expectations of customers, which comes via, listening to customers and obtaining feedback for improvement (Migayawa &Yosahida, 2010). On a continuous basis, customer satisfaction must be stressed (Nasar et al, 2012). The major aim of TQM implementation in any organisation must be to satisfy the needs of the customers and this must be emphasized in the mindset of the entire workforce. The fundamental step is to identify the needs of customers and their level of satisfaction with the finished product. Setting of quality values and goals of any organisation must be based on the values set by the customers in line with their needs and expectations. According to Goetsh & Davis (2010), it is more expensive for organisations to gain a new customer than to keep a satisfied customer and further, easier to keep a customer that is pleased in the products (Miyagawa & Yoshida, 2010).

Workforce management

Workforce management can be defined as a systematic and planned activities to enhance an individual's performance. Success of TQM depends on people orientation that can be exhibited through initiatives such as team work, training and development (Sumukadas, 2016). Workforce management involves empowering the workforce to solve problems and make decisions at levels appropriate (Isaac & Thomas, 2016). This step is of great importance as workforce is closest to problems identified and are in the best position to take decisions that will solve the problem to improve production process. Workforce management begins with a personal commitment to quality. If the workforce accepts and commit to a quality course, they are more likely to be involved in quality tools and technique and apply the techniques in their daily activities (Arewa & Farell, 2015). Workforce management include entails involvement of employees at all levels of the organisation, use of systems that motivate and promote workforce involvement, support from workforce should be encourage throughout the organisation, the level and effectiveness workforce should be assessed, teamwork should be encouraged between departments through effective workforce management to ensure effective TQM implementation (Zu et al, 2009).

Strategic planning

Strategic planning is a necessary foundation in the success of TQM, specifically, strategic plans on quality issues should be based on strength, weakness, opportunity and threats analysis (Hokoma et al, 2010; Talib et al, 2010). Substantial attention has been paid to quality planning that are customer based by quality gurus though the attention they give to strategic planning vary. Planning is a vital stepping stone to accomplishing any task, TQM cannot be accomplished without strategic planning (Zu et al, 2010). One important factor that influences performance of any organisation is the strategic plan in place, which must be inclined towards quality. Several factors are reported in literature why organisation

fail in their quest for TQM implementation and of which the commonly cited is lack of effective strategic planning. When strategic plans are not clearly defined, it is difficult to implement quality plans. According to Gimenez-Espin et al, (2013), it is also important for strategic plans to be customer driven that is, customers must be at the center of strategic plans of any organisation.

Process management

In any organisation, processes especially those that involve quality initiatives should include all functions and departments as the central focus of production (Albayak &Albyak, 2014). A combination of process understanding and process improvement is the lifeline of any organisation seeking to implement TQM. Process is what transform the input (i.e., actions, methods and operations) into output and should be error proof (Das et al, 2011). For organisations that are quality focused, the customer should be at the center of the process; that is, the output must satisfy or exceed the needs and expectations of their customers. At every stage of the process whether it is documented or not, several processes take place. Processes interact with each other throughout an organisation because the output from a process can be the basis of input to another process (Talib et al, 2011).

Measurement analysis

Measurement analysis is a detailed assessment of a measurement process that include research that is designed to identify variations that occur in the production process (Yasin et al, 2007). similar to the production process that varies, the process of data collection and analysis also varies and can generate wrong results. Measurement analysis checks the method used to conduct the test, the instrument used to conduct the test and the process of collecting the data to ensure the integrity of the data for analysis (Jaca et al, 2015). A careful assessment of the implication of errors is dome prior to decision making about the product or process. measurement analysis is vital for quality management and six sigma methodology. The personnel, the software and procedure are all important in measurement analysis (Tapalovic, 2005).

The six practices identified (Top Management support, customer focus, workforce management, strategic planning, process management and measurement analysis) formed the bases of the questionnaire, Top Management support, customer focus, workforce management and measurement analysis had six questions each, while strategic planning and process management had seven questions each.

PROBLEM STATEMENT AND RESEARCH QUESTION

The construction industry in Nigeria has been associated with poor quality of construction products (Akinola, Akinderawo, & Olatunji, 2012). A general decline in performance of the construction industry has been observed in recent past, perhaps exacerbated by the rash of collapsed building, prevalence of abandoned construction sites and general poor quality of completed projects (Sanni & Windapo, 2008). The concept of TQM is relatively new in Nigeria (Orumwense 2014); thus, it is not progressing at the same rate as in developed countries. TQM focuses on improved customer satisfaction; however, there is no commitment to the cause among organizations in Nigeria (Chukwuka , 2016). Previous research projects have viewed TQM as generic across industries and have classified firms as

having the same size and financial strength (Schonberger, 2017). In addition, almost all decisions on quality and related issues are focused on large organisations neglecting smaller firms (Cengiz 2018). Attempts should be made at assessing TQM based on the sizes of firms rather than generating generic results this is based on the fact that TQM is important for small organisations as it is for large organisations (Haksever, 2018). This research is aimed at assessing the level of TQM practice in construction firms in Nigeria. The study will identify the TQM practices adopted in construction firms in Nigeria and assess the level of adoption of the Practices. the study will answer the following research questions

1. What are the TQM practices adopted by Construction firms in Nigeria?
2. What is the level of adoption of TQM practices in Nigerian construction firms?

RESEARCH DESIGNS AND METHODS

This research reviewed literature that suggests that researchers have assessed various aspects of TQM. This study intends to assess the level of adoption of TQM practices in construction firms based on the organisational profiles of the firms studied i.e. number of departments in the firms, type of construction undertaken by the firms (Building, Civil engineering construction or a combination of construction types and the annual turnover (BPP classified the turnover of firms as between N100million to 300million, N300million to 1billion, N 1billion to 10 billion and over N10 billion). Response to questions in the questionnaire enabled the assessment of the level of the six TQM practices (Top Management support, customer focus, workforce management, strategic planning, process management and measurement analysis) of construction firms in Nigeria. The survey design was adopted and it allows the collection of quantitative and qualitative data which can be analyzed. descriptive statistics was adopted for this study. The survey method has been applied in research examining aspects of TQM (Akinola, Akinderawo, & Olatunji, 2012;Gunning & McCallion, 2007; Jimenez-Jimenez, D. Martinez-Costa M, Martinez-Lorente, & Rabeh, 2014),

Data Collection

This study focused on construction organisations registered with the Bureau for Public Procurement (BPP). The BPP, in line with Section 6(1) (f) of the Public Procurement Act 2007 is empowered to maintain a National Database of Federal Contractors and Service Providers (NDCCSPs). The BPP, to the exclusion of all procuring entities, prescribe classifications and categorizations for the companies on the register and has commenced registration of Federal Contractors and Service Providers (CCSPs).

The target respondents of this survey are Construction Organisations in Nigeria. To ensure that this study can be applied nationwide, it becomes pertinent that contractors are selected across the country. A comprehensive list consisting of 88,424 contractors was obtained from the BPP database. This constitutes the target population. Stratified random sampling method was used to determine the sample size of the research. The determination of sample size is a common task for many researchers. Inappropriate, inadequate or excessive sample sizes could influence the quality and accuracy of any research. There exists efficient and robust formula

for selecting the sample size for a research problem based on a level of significance. Cochran (1977) and Leme-Show (2011) proposed predetermined margin of error.

A sample size of 383 is needed to arrive at a sample with a sampling error of at least 5%. This sample size is further supported in the sampling tables presented by Saunders et al. (2009), Cohen et al. (2007) and Bertex et al. (2006). The choice of 384 is consistent with the three tables for a population size of less than 100,000 with 95% confidence level and 5% margin of error. A questionnaire is the set of questions arranged in a specific structure to extract information (Asika, 2006). The survey instrument (questionnaire) was developed based on literature review, the identified variables (six TQM practices) were used to construct appropriate measures. The questionnaire was personally administered by the researcher face to face. The sizes of the construction firms were determined by the number of departments in the firms thus a firm can have more than one response. The reliability of the instrument was measured using the Cronbach alpha and all the constructs are above 0.70 which is acceptable.

ANALYSIS AND FINDINGS

Likert scale was used for each item measured 5 Points representing Strongly Agree an 1 point Strongly Disagree. The data collected were analyzed using SPSS version 21 to cross tabulate the profiles of the firms (number of departments, type of construction and the annual turnover of the firms)

	Type of Construction			Turnover of Firms			
	BD	CV	BCV	A	B	C	D
Firms with 1 Department (N=109)							
Top management support	4.03	4.01	3.55	3.99	4.12	3.79	4.03
Customer focus	2.65	4.14	4.14	3.93	4.03	3.97	3.33
Workforce management	3.57	4.15	4.38	3.97	3.95	3.91	4.06
Strategic planning	3.84	3.40	3.95	3.53	3.50	3.89	3.41
Process management	4.19	4.02	4.33	4.04	4.11	4.08	4.14
Measurement analysis	4.10	4.29	4.02	3.56	3.51	3.49	3.51
Firms with 3 Departments (N=24)							
Top management support	3.96	3.52	3.77	3.84	3.81	3.85	
Customer focus	3.85	3.69	3.58	3.73	3.75	3.64	
Workforce management	3.93	3.69	3.91	3.88	3.78	3.80	
Strategic planning	3.69	4.02	4.01	2.75	3.97	3.84	
Process management	4.20	3.96	3.99	3.98	4.00	3.87	
Measurement analysis	3.87	3.85	3.99	3.83	4.03	3.81	
Firms with 4 Departments (N=56)							
Top management support	3.85	3.65	3.94	4.08	4.00	4.02	3.73
Customer focus	3.65	3.50	4.00	3.87	3.81	4.27	2.67
Workforce management	4.07	3.60	4.01	4.16	3.90	3.89	3.36
Strategic planning	4.00	4.16	4.13	4.08	4.00	4.22	3.70
Process management	4.02	4.18	4.25	4.22	4.12	4.25	3.17

Measurement analysis	3.17	3.53	3.53	4.02	4.24	4.17	4.00
Firms with 5 Departments (N=100)							
Top management support	3.53	4.01	4.35	3.40	4.19	4.34	4.21
Customer focus	3.94	3.74	3.38	3.61	3.90	3.86	3.85
Workforce management	4.07	4.10	4.32	4.14	4.34	4.22	4.26
Strategic planning	4.34	4.04	4.16	4.15	4.08	4.16	4.22
Process management	4.15	4.12	4.08	4.12	4.07	4.05	4.28
Measurement analysis	4.16	3.93	4.15	4.11	3.96	4.19	4.19
Firms with 6 Departments (N=60)							
Top management support	4.03	4.15	4.05	4.00	4.11	4.02	4.11
Customer focus	3.84	3.67	3.63	3.61	3.64	3.66	4.01
Workforce management	3.98	3.91	4.04	3.69	4.26	4.06	4.20
Strategic planning	3.86	4.27	4.08	4.01	3.78	4.05	4.18
Process management	4.17	4.32	4.06	4.08	3.51	4.14	4.49
Measurement analysis	4.03	4.03	3.96	3.89	2.71	3.96	4.07
Firms with 7 Departments (N=35)							
Top management support		4.12	3.02	4.10	4.00	3.33	3.17
Customer focus		3.74	3.45	3.68	3.64	3.92	3.46
Workforce management		4.13	3.95	4.15	4.03	3.78	4.20
Strategic planning		3.91	4.12	4.34	4.29	3.86	4.17
Process management		4.01	3.33	4.29	4.14	3.67	3.77
Measurement analysis		3.62	3.71	4.01	3.99	4.17	3.43
Firms with 8 Departments (N=16)							
Top management support	3.52		3.82			3.79	3.36
Customer focus	3.04		3.74			3.65	3.4
Workforce management	3.25		3.98			4.01	3.35
Strategic planning	3.95		2.67			3.33	3.90
Process management	3.23		4.22			3.85	3.84
Measurement analysis	3.52		4.31			3.45	3.81
Firms with 9 Departments (N=18)							
Top management support			3.82			3.17	3.44
Customer focus			3.80			3.83	3.46
Workforce management			3.89			3.97	3.54
Strategic planning			3.94			4.10	3.77
Process management			3.81			3.83	3.53
Measurement analysis			3.81			4.53	3.54

BD=Building Construction, CV= Civil Engineering Construction, BCV = Combination of all construction types, A= N100 million-300 million, B=N300 million-1b, C= N1b-10b, D=Over N10b

DISCUSSION OF RESULTS

Top Management support

The grand mean of the response ranges from 4.35 as the highest (under BCV for firms with 5 departments) and 3.17 as the lowest (under D for firms with 7 departments and under C for firms with 9 departments). The overall mean for top management support in is 3.93, this is the average mean of top management

support in all the firms studied. This means that the respondents agree that top management of construction firms adopt TQM. The findings are line with some other exiting findings (e.g. Das et al, 2011; Hokoma et al, 2010; Valmohammadi, 2011 & Talib et al, 2012)

Customer focus
The mean of the response's ranges from 4.27 (under C for firms with 4 departments) and 2.65 (under BD for firms with 1 department). In summary, the average mean of all the firms studied is 3.77, this implies that the firms agree that they execute the activities that make up customer focus practice. The findings confirm the findings by Talib et al (2012) whose findings show a high degree of customer focus in the firms' studies. He further confirmed that customer focus is important for TQM implementation in UK organisations

Workforce management
The grand mean of the responses is between 4.38 as the highest (under a combination of all construction types for firms having 1 department) and 3.25(under Building construction for firms having 8 departments) with an overall average of 4.04. The findings of this study are in agreement with the conclusion by Sumukadas, 2006 and Das et al, 2011, whose findings conclude that workforce involvement is important for TQM to be effectually realized, their findings indicates a high level of workforce commitment to quality in the firms studied.

Strategic planning
The findings show that the grand mean of strategic planning ranges between 4.34 as the highest (under building construction for firms having 5 departments) and 2.67 as the lowest (under with an overall average of 4.00 for the firms studied. This implies that the respondents agree with the strategic planning practice. The findings are in line with the findings of Hokoma et al (2010) and Tablib et al (2010).

Process management
The grand mean of the responses range between 4.49 as the highest (under D in firms having 6 departments) and 3.17 as the lowest (under D in firms having 4 departments). the average grand mean for the 46 classes of firms is 4.09. The findings by Kaluarachchi(2010) who studied Sri Lankan firms and Wu (2014) who studied Chinese firms.

Measurement analysis
The grand mean of the practice ranges from between 4.53 as the highest (under C in firms having 9 departments and 2.71 as the lowest (under B in firms having 6 departments) with an overall average of 3.95 for the 46 classification of firms. The findings are consistent with the findings of Joseph et al (2010), Jaca et al (2015) and Topalovic (2005) whose findings show high level of measurement analysis practice in the firms studied

CONCLUSION AND RECOMMENDATION

This study is aimed at assessing the level of TQM implementation in Nigerian construction firms. six practices (top management support, customer focus, workforce management, strategic planning, process management and measurement analysis). The findings of the study indicate that the level of TQM

practices based on the profile of the firms is above average mean of 2.5. the constructs assessed are common with literature published, TQM must start with top management and must show commitment towards the course, the central focus of quality is the customer thus firms must demonstrate their commitment to customer satisfaction, workforce execute the plans that organisations are set to achieve thus their input in the TQM process cannot be overemphasized. Strategic plans must be customer driven; the process must be effectively managed to achieve desired results. These constructs are in common with the published literature to date. This is true as TQM must start at the top. The most senior managers must all demonstrate that they are serious about quality. Top management must accept the responsibility for commitment to a quality policy that deals with the organisation for quality and for the satisfaction of the customer needs. This commitment to quality and leadership must be demonstrated by developing and communicating the vision and mission. This study has contributed to TQM practices across levels of various Construction firms in Nigeria. It thus provides future researchers with a wider understanding of the practices that can inform the development of more effective and empirically grounded models for TQM implementation. Also, this study recognized the need to address TQM practices across firms based on their sizes. Such an attempt is believed to provide a better knowledge and a wider vision for implementing TQM successfully in developing countries, for all categories of firms. The study recommends that there is need for the creation of an entity exclusively responsible for assisting firms in the adoption and implementation of TQM.

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