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INFLUENCE OF ORGANIZATIONAL SUB-CULTURE ON TOTAL QUALITY MANAGEMENT PRACTICES IN NIGERIAN CONSTRUCTION FIRMS

Yetunde Olanike Olaleye[1],Yahaya Makarfi Ibrahim[2], Ahmed Doko Ibrahim[3] and Kulomri Jaule Adogbo[4]
[1,2,3,4]*Department of Quantity Surveying, Ahmadu Bello University, Zaria*

Construction in Nigeria is characterized by lack of adherence to standard and lack of implementation of Quality management practices. Recent study in the field of TQM shows that there is increasing recognition of the influence of organisational culture on the success or failure of TQM implementation. This paper is aimed at examining influence of organisational subculture on Total Quality Management practices in Nigerian construction firms, and establishing the culture type(s) that could be strengthened to support TQM implementation. The survey research method was used for the study. The research was carried out by administering structured questionnaires to managers and heads of departments of construction organisations in Nigeria. A total number of 659 questionnaires were administered and 418 returned giving a response rate of 63%. The research was analysed using Structural Equation Modelling Smart PLS 3. The findings of the study revealed that only the Clan subculture has significant relationships with all the TQM practices. Strengthening the Clan subculture will improve the success of TQM implementation. The study recommends that any efforts that can be made to increase the presence of Clan subculture prior to commencing the formal implementation of TQM would be highly beneficial

Key words: organisational subculture, quality, total quality management

INTRODUCTION

The concept of quality is broad and related to a wide range of human needs (Reid & Sanders, 2012) Total quality management (TQM) can be defined as a management philosophy aimed at achieving customer satisfaction (Baird, Jia &Reeve, 2010; Calabrese & Corbo, 2015). Valmohammadi & Roshamir (2015) describes TQM as a collective interlinked system of quality practices that is associated with the performance of organisations. TQM is aimed at achieving customer satisfaction not only in the production of goods and services that meets

[1] yettynike@gmail.com
[2] makarfi@gmail.com
[3] adibrahim2@yahoo.com
[4] kjadogbo@yahoo.com

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customers' needs and requirements but also exceeding them through continuous improvement (Prajogo & McDermott, 2011). In an attempt to improve quality and performance, many companies have focused on TQM. However, in spite of these claimed benefits, a closer examination of literature shows that implementing TQM has attained about 30% success, thus it has achieved less than intended results and one of the key barrier is organisational culture (Gambi, Gerolamo, & Carpinetti, 2013). TQM as a management concept has been in existence for over five decades and has been generally accepted by firm, however firms record less than optimal results from its adoption (Jayaram et al., 2010). Recent studies in the field of TQM show that there is increasing recognition of the influence of Organisational Culture on the success or failure of TQM implementation (Green, 2012; Haffar et al., 2013; Jimenez-Jimenez, Martinez-Costa, Martinez-Lorente, & Rabeh, 2014; Rad, 2006). Study of the cultural profile of organisations is vital for successful implementation of TQM (Rad, 2006). The important role of OC in TQM success is often referred to in the literature (Chung et al., 2010; Gimenez-Espin et al., 2013; Green, 2012; Haffar et al., 2013; Prajogo and McDermott, 2005; Rad, 2006; Zu et al., 2010). Organisational Culture is a set of shared meanings that make it possible for members of a group to interpret and act upon their environment (Valmohammadi & Roshami, 2015). Organisational culture depends for its existence on a definable organisation, in the sense of a number of people interacting with each other for the purpose of accomplishing same goal in their defined environment (Mathew, 2007). The success of TQM implementation depends to a large extent on the organisational subculture, this makes it important to take the culture of organisations into consideration before attempting to implement TQM (Zu et al, 2010; Valmohammadi & Roshamir, 2015; Roldan et al, 2015). The impact of organisational culture is felt on the operation of the business and on the performance of the firms (Cadden, Marshall & Cao, 2013). Consequently, Organisational culture and TQM can individually and jointly promote the performance of organisations. This study assessed the influence of organisational subcultures on TQM practices by examining the relationship between each subculture type and TQM practices an also by establishing the right subculture mix for TQM implementation in Nigerian construction firm.

LITERATURE REVIEW

Organizational culture

The culture of organisations can be described as a set of common assumptions that makes it possible for organisational members to act and interpret their environment (Valmohammadi & Roshamir, 2015). The shared assumptions and the understanding lie in level that is conscious for individuals, the assumption is identified through stories, norms and artifacts that emerge from the behavior of individuals (Haffar et al 2013). The culture of an organisation defines the core values, assumptions, interpretation and approaches that characterize and organisation (Cameron & Quinn, 2005). The existence of organisational culture depends on a people i.e. a number of people interacting with each other mainly to achieve set goals in their defined environment (Zu et al, 2010). Within organisations, different subunits exist and each unit can exhibit its own unique culture referred to as subcultures. Organisations can have several departments and each department can exhibit its own culture. For example, the subculture of the

administrative department may differ significantly from the finance department etc. in addition to that, subculture can exist based on hierarchical levels, top management subculture may differ from the lower cadre (Cameron & Quinn, 2005; Prajogo &McDermott, 2005).

This study adopts the competing values framework (CVF) proposed by Cameron & Quinn (2005). The CVF explores the in-depth structure of cultures that relates to compliance, motives, leadership, desion making effectiveness and organisational forms in organisations (Chunget al.,2010; Gimenez-Espin et al., 2013; Haffar et al., 2013). The CVF's basis is on two major dimensions that diagnoses the subcultural profile of organisations base on effectiveness indicators into four clusters (Zu et al, 2010). The CVF evaluates six dimensions of culture (dominant characteristics, leadership, management of employees, organisational glue, strategic emphasis and criteria for success) to assess the subcultural profile of organisations. One dimension of the CVF places emphasis on the focus of the organisation both internal and external, the second-dimension places emphasis on the difference between flexibility on one end and stability on the other end. The two dimensions forms four quadrants with each quadrant representing a subculture type referred to as the Clan, Adhocracy, Marketing and Hierarchical subculture. None of the subculture type is superior over others (Valmohammadi & Roshamir, 2015). The CVF has been adopted in previous studies to assess the influence of organisational cultures on management issues such as TQM (Gimenez-Espin et al., 2013; Haffar et al., 2013; Prajogo and McDermott, 2005; Zu et al., 2010).

	Flexibility and Discretion		
Internal Focus and Integration	**Culture Type: CLAN** **Orientation**: Collaborative **Leader Type**: Facilitator, Mentor Team builder **Value Drivers:** Commitment Communication Development **Theory of Effectiveness:** Human development and participation produce effectiveness. **Quality Strategies**: Empowerment, Team building Employee involvement, Human resource development and Open communication	**Culture Type: ADHOCRACY** **Orientation:** Creative **Leader Type:** Innovator Entrepreneur Visionary **Value Drivers:** Innovative outputs Transformation Agility **Theory of Effectiveness:** Innovativeness, vision, and new resources produce effectiveness **Quality Strategies:** Surprise and delight Creating new standards Anticipating needs Continuous improvement Finding creative solutions	**External Focus and Differentiation**
	Culture Type: HIERARCHY **Orientation:** Controlling **Leader Type:** Coordinator Monitor Organizer **Value Drivers:** Efficiency Timeliness Consistency and uniformity **Theory of Effectiveness**: Control and efficiency with capable processes produce effectiveness **Quality Strategies**: Error detection, Measurement, Process control, Systematic problem solving, Quality tools (fishbone diagrams, Pareto charting, affinity graphing)	**Culture Type: MARKET** **Orientation:** Competing **Leader Type**: Hard driver Competitor Producer **Value Drivers:** Market share Goal achievement Profitability **Theory of Effectiveness:** Aggressively competing and customer focus produce effectiveness **Quality Strategies:** Measuring customer preferences Improving productivity Creating external partnerships Enhancing competitiveness Involving customers and suppliers	
	Stability and Control		

Figure 1.: Competing Values Framework adapted from Valmohammadi & Roshamir, (2015) These 4 typologies of organisational culture simultaneously exist theoretically in every organisation as the

a. Clan culture
b. Adhocracy culture
c. Marketing culture

d. Hierarchical culture

Clan culture: Clan culture places emphasis on flexibility and internal orientation Cameron & Quinn, 2005). Organisations with emphasis on this culture promote the development of human resources, emphasizing openness, participation, cohesiveness and commitment to membership. Such organisations are typified as a friendly place to work where people share a lot (Zu et al, 2015).

Adhocracy culture: Cameron and Quinn (2005) described adhocracy culture as one that emphasizes flexibility but with more focus on the external environment. The orientation is towards growth, creativity stimulation, resource acquisition, innovation, and continual adaptation to the external environment (Ivana & Matina, 2016).

Marketing culture: According Cameron and Quinn (2005), the marketing culture is also focused on the external environment but is control-oriented. It emphasizes productivity, performance, goal achievement, and one of the primary motivating factors is competition. Such organisation is a results-oriented workplace. Leaders are hard-driving producers, directors, and competitors. They are tough and demanding (Baird et al, 2011).

Hierarchical culture: According Cameron and Quinn (2005), the hierarchical culture is both control and internal oriented. It emphasizes rules and regulations, and standardization to achieve control and stability. Such organisation is characterized as a formalized and structured place to work. Procedures and well-defined processes govern what people do. Effective leaders are good coordinators, organizers, and efficiency experts.

TOTAL QUALITY MANAGEMENT

The advent of TQM spans over three decades ago, it has proven to be one of the most significant innovations that influence management practices of organisations. TQM first appeared in the US in the early eighties in response to the intense challenges and competition facing US organisations from Japanese firms (Liu, Zhang & Shroeder, 2011; Prakash, Barua & Balon, 2015).The generic term "total quality management" is used to mean the vast collection of philosophies, concepts, methods, and tools now being used throughout the world to manage quality (Juran and Godfrey, 1998). Quality management (QM) is defined as an method of achieving and sustaining high quality products and services, TQM practices are the observable side of TQM through which management work to realize improvements in organisations (Valmohammadi & Roshamir, 2015). TQM practices are presented in frameworks used in presenting National Quality awards such as the Malcom Balderige National Quality award (MBNQA). In recent times, quality awards are used as a guide to TQM implementation by a large number of organisations (Zu, Robin & Fredndall, 2010). This study examined six TQM practices (top management support, workforce management, customer focus, strategic planning, process management and measurement analysis) according to the MBNQA to investigate the implementation of TQM in Nigerian Construction firms.

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).

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.

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).

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.

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.

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.

Organizational subculture and TQM

Problems associated with TQM implementation has been reported in literature (Gimenez-Espinetal.,2013), among several factors attributed as key to the success of TQM is the organisational culture of the firms . the relationship that exists between the various culture types and TQM have been previously reported (Gimenez-Espinetal.,2013; Haffar et al.,2013; Zu et al., 2010). This study assessed the influence of Organisational subculture and its effect on TQM. This implies that each subculture types and TQM practices will be considered in the analysis. not any of them are superior over the others (Gimenez espin et al., 2013). In addition, few organizations are featured by only one culture type, rather they have a culture profile consisting of different culture types (Zu et al., 2010). To adopt any successful change in an organisation, the culture cannot be over emphasized. Kaluarachchi et al (2010) stated that TQM programmes are likely to succeed if the dominant organisational subculture is compatible with the basic assumptions and value are in agreement with the principles of TQM. The success of TQM depends largely on the subcultural profile of the organization implementing it (Soltani, 2008).

Relationship between Organisational Subculture and TQM practice

Previous researches on TQM and Organisational subculture has established different relationships that exists between both concepts (Zu et al, 2010, Valmohammadi &Roshamir, 2015). A set of four independent variables (clan subculture, adhocracy subculture, marketing subculture and hierarchical subculture) are theoretically related to six dependent variables (Top management support, customer focus, workforce management, strategic planning, process management and measurement analysis). Based theory that defines the hypothesis, the regression paths of all the hypothesis are positive. The implication is that when a score on any of the independent variable goes up i.e. the stronger the subculture the score on the TQM practice goes up i.e. the TQM practice goes up showing a positive relationship. The following theoretical relationships exists between Organisational Subculture and TQM practices:

Clan subculture is positively related with customer focus.
Clan subculture is positively related with workforce management.
Clan subculture is positively related with process management practice.
Adhocracy subculture is positively related with customer focus practice.
Marketing subculture is positively related with customer focus practice.
Marketing subculture is positively related with workforce management practice.
Marketing subculture is positively related with process management practice
Hierarchical subculture is positively related to workforce management practice

Problem Statement/ Research question

Previous researches have looked into the relationships that exist between TQM practices and Organisational Culture, however, they view organisation as having only one culture. Few organisations are featured by only one culture type rather organisations have a profile consisting of subculture (Lok, Rhodes, & Westwood, 2011; Zu et al., 2010), existence of these subcultures bring diversity into the situation as they can work in agreement with TQM practices or work against it. Previous researches have not examined the influence organisational subcultures have on TQM practices (Gimenez-Espin et al., 2013; Green, 2012; Valmohammadi & Roshanzamir, 2015) in order to develop strategies for successful TQM implementation. Thus, this study will investigate the influence of organisational subculture on TQM practices in the Nigerian construction industry. The study will address the following research questions

What is the relationship between each subculture type and TQM Practices?

what is the right subculture mix for TQM implementation in Nigerain construction firms?

RESEARCH DESIGNS AND METHODS

This research reviewed literature that suggests that most researchers have looked into the relationship that exists between TQM and Organisational Sub-Culture and considers the fact that Organisational Sub-Culture precedes TQM implementation. The survey strategy will be adopted for this research. Response to the research questions will help to determine the type of subculture that should be strengthen to support TQM success in the Nigerian Construction Industry. The data collection

process points towards the positivism research philosophy and the deductive research approach, this further points towards the survey strategy since it also allows the collection of large data from the population. The survey method has been applied in research examining aspects of TQM (Akinola, Akinderawo, & Olatunji, 2012), Organisational Culture (Ivana & Martina, 2016; Oney-Yacizi, Gritili, Topcu-Oraz, & Acar, 2007)) and relationship between Organisational Culture and TQM (Haffar, Al-Karaghouli, & Ghoniem, 2013; Valmohammadi & Roshanzamir, 2015).

This study focused on construction organisations registered with the Bureau for public procurement. The target respondents of this survey are Construction Organisations in Nigeria. A comprehensive list consisting of 88,424 contractors was obtained from the BPP database. This constitutes the intended population. The determination of sample size is a common task for many applied researchers. Inappropriate, inadequate or excessive sample sizes could influence the quality and accuracy of any research. An 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% (Saunders etal,2009, Cohen et al, 2007 & 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.

DATA COLLECTION

To achieve the objectives of this research, it is necessary to collect information on the type of organisational subculture, and the significant TQM practices that exist in the Nigerian construction organisations. An interview was conducted to guide the respondents on the questions raised in the questionnaire. The questionnaire is divided into three sections to provide empirical evidence to answer the research questions. The first section of the questionnaire constitutes questions on personal information of the respondents. The second section of the survey instrument will examine TQM concepts and practices. To identify the practices, extensive literature review was carried out to derive a set of common practices filtered from a list of practices. Respondents were asked to indicate their agreement or disagreement on the existence of the identified TQM practices in their organisations. Likert scale was used to calculate the mean of the practices. The third section of the questionnaire will identify the dominant subculture in the organisations and its characteristics. Specifically, the six key dimensions of organisational culture (Dominant Characteristics, Organisational Leadership, Management of Employees, Organisational Glue, Strategic Emphasis, and Criteria for Success) will be measured using the Competing Value Framework (CVF). The CVF was used for assessing and profiling the dominant cultures in organisations because it helps individuals to identify the underlying cultural factors that exist in their organisations.

ANALYSIS AND RESULTS

Likert scale was used for each item measured 5 Points representing Strongly Agree and 1 point Strongly Disagree. The descriptive analysis of the data collected were analyzed using SPSS version 21 and the partial least square structural equation

modelling (SmartPls 3) for the inferential statistics. Structural equation modelling was developed out to demand to test theories and concepts by estimating the composite relationship between identified variables (Hair et al, 2014). PLS is a variance based PLS path modelling similar to multiple regression analysis in operations and has the benefit of relaxed distributional assumptions, ability to use smaller sample size while still achieving high levels of statistical predictive power (Chin, 2010; Robins, 2012)

Internal consistency: The results of the internal consistency also referred to as composite reliability for the firms is presented in table 1. SmartPls prioritizes the indicators according to their individual reliabilities and thus utilize composite reliability as against the traditional criterion of internal consistency (Cronbach's alpha). It is however interpreted in the same way as Cronbach alpha. All the constructs meet the minimum threshold of 0.70. The scores as presented in table are as follows: measurement analysis 0.812, process management 0.841, top management 0.867, workforce management 0.851, customer focus 0.848, strategic planning 0.853, marketing subculture 0.782, clan subculture 0.832, hierarchical subculture 0.825, adhocracy subculture 0.802.

Convergent validity: A common measure used in establishing the convergent validity of constructs is the Average Variance Extracted (AVE). this is referred to as the grand mean of the squared loadings of the indicator associated with each construct. Table 1 shows the AVE of the model. The findings show that the 10 constructs meet the minimum 0.50 threshold. The hierarchical subculture has the highest AVE of 0.588, adhocracy subculture 0.576, clan subculture 0.557, marketing subculture 0.552, strategic planning 0.538, process management 0.534, measurement analysis 0.523, top management 0.523 and workforce management 0.502.

Coefficient of determination (R2): The most common method utilized by SmartPls to evaluate structural model is the value of the coefficient of determination R2 value. R2 measure the predictive accuracy of the model and it represents the combined effect of the exogeneous latent variables on the endogenous variables. R2 values ranges from 0 to 1. R2 value of 0.75, 0.50 and 0.25 for endogenous latent variables can be interpreted as substantial, moderate or weak respectively.

Table 1: Composite reliability, AVE and R^2

Construct	Cronbach's Alpha	Composite Reliability	Average Variance Extracted (AVE)	R2	Q2
Adhocracy	0.734	0.802	0.576		
Clan	0.757	0.832	0.557		
Hierarchical	0.737	0.825	0.588		
Marketing	0.798	0.782	0.552		
Customer Focus	0.774	0.848	0.530	0.457	0.273
Measurement Analysis	0.724	0.812	0.523	0.665	0.193
Process Management	0.783	0.841	0.534	0.858	0.219
Strategic Planning	0.785	0.853	0.538	0.865	0.288
Top Management	0.817	0.867	0.523	0.623	0.230
Workforce Management	0.789	0.851	0.502	0.846	0.270

Higher level indicates higher level of predictive accuracy. Table 1 shows the results of the firms. The findings indicate that the four subculture types explain 86.5% of the variance in strategic planning (Substantial), 85.8% of the variance in Process management (Substantial), 84.6% of the variance in workforce management (Substantial), 66.5% of the variance in Measurement analysis (Moderate), 62.3% of the variance in top management (Moderate), and 45.7% of the variance in customer focus (Moderate).

Path Coefficients: Table 2 shows the results of the path coefficients. Results of Path coefficients are always standardized coefficients. They vary from -1 to +1. The closest to 1 reflects the strongest paths (Hair et al, 2012). The results show that the path coefficient between the adhocracy subculture and customer focus is 0.090, with measurement analysis is 0.032, 0.041 with process management, 0.200 with strategic planning, 0.020 with top management and 0.094 with workforce management. The coefficient between the clan subculture and customer focus is 0.467, 0.415 with measurement analysis, 0.312 with process management, 0.237 with strategic planning, 0.355 with Top management and 0.308 with workforce management. The hierarchical subculture has a path coefficient of 0.185 with customer focus, 0.131 with measurement analysis, 0.079 with Process management, 0.148 with strategic planning, 0.223 with top management and 0.186 with workforce management. The marketing subculture has a path coefficient of 0.055 with customer focus, 0.184 with measurement analysis, 0.380 with process management, 0.260 with strategic planning, 0.149 with top management and 0.250 with workforce management. The adhocracy subculture has the strongest relationship with the strategic planning practice and the weakest relationship with the top management construct, the clan subculture has the strongest relationship with the customer focus practice and the weakest relationship with the strategic planning practice, the hierarchical subculture has the strongest relationship with the workforce management practice and the weakest relationship with the process management practice while the marketing subculture has the strongest relationship with the process management practice and the weakest relationship with the customer focus practice. The summary of the findings show that the subcultures have a positive relationship with TQM practices.

Table 2: Path coefficient

	Customer Focus	Measurement Analysis	Process Management	Strategic Planning	Top Management	Workforce Management
Adhocracy	0.090	0.032	0.041	0.200	0.020	0.094
Clan	0.467	0.415	0.312	0.237	0.355	0.308
Hierarchical	0.185	0.131	0.079	0.148	0.223	0.186
Marketing	0.055	0.184	0.380	0.260	0.149	0.250

Effect size F2: In addition to evaluating the predictive relevance of the endogenous constructs, the f2 effect size is also analysed. Table 3 shows the f2 results of the firms. The adhocracy subcultures have effect size of 0.03 on customer focus (small), 0.091 on measurement analysis (small), 0.016 on process management (small), 0.001 on strategic planning (small), 0.081 on top management (small) and 0.393 on workforce management (large). The clan subculture has f2 effect size of 0.023 on customer focus (small), 0.128 on measurement analysis (small), 0.066 on process

management (small), 0.658 on strategic planning (large), 0.124 on top management (small) and 0.050 on workforce management (small). The hierarchical subculture has f2 effect sizes of 0.378 on customer focus (large), 0.007 on measurement analysis (small), 0.309 on process management (medium). 0.455 on strategic planning (large), 0.008 on top management (small) and 0.050 on workforce management (small). The marketing subculture have f2 effect size of 0.001 on customer focus (small), 0.013on measurement analysis (small), 0.500 on process management (large), 0.001 on strategic planning (small), 0.002 on top management (small) and 0.732 on workforce management (large).

Table 3 F^2 Effect size

	Customer Focus	Measurement Analysis	Process Management	Strategic Planning	Top Management	Workforce Management
Adhocracy	0.003	0.091	0.016	0.001	0.081	0.393
Clan	0.023	0.128	0.066	0.658	0.124	0.050
Hierarchical	0.378	0.007	0.309	0.455	0.008	0.050
Marketing	0.001	0.013	0.500	0.001	0.002	0.732

Size and significance of path coefficients: The next step after running the SmartPls algorithm is to obtain estimates for the structural relationship between the constructs, this represents the hypothesized relationships.

Table 4: Mean, STDEV, T-Values, P-Values

	Sample Mean (M	Standard Deviation (STDEV)	T Statistics (|O/STDEV|)	P Values	sig
Adhocracy -> Customer Focus	0.087	0.061	1.487	0.138	NS
Adhocracy -> Measurement Analysis	0.030	0.059	0.538	0.591	NS
Adhocracy -> Process Management	0.037	0.051	0.794	0.428	NS
Adhocracy -> Strategic Planning	0.199	0.060	3.319	0.001	***
Adhocracy -> Top Management	0.018	0.065	0.315	0.753	NS
Adhocracy -> Workforce Management	0.094	0.067	1.403	0.161	NS
Clan -> Customer Focus	0.472	0.074	6.279	0.000	***
Clan -> Measurement Analysis	0.427	0.070	5.970	0.000	***
Clan -> Process Management	0.319	0.064	4.888	0.000	***
Clan -> Strategic Planning	0.241	0.071	3.344	0.001	***
Clan -> Top Management	0.362	0.072	4.948	0.000	***
Clan -> Workforce Management	0.306	0.067	4.579	0.000	***
Hierarchical -> Customer Focus	0.185	0.066	2.813	0.005	**
Hierarchical -> Measurement Analysis	0.123	0.075	1.745	0.082	*
Hierarchical -> Process Management	0.075	0.064	1.246	0.213	NS
Hierarchical -> Strategic Planning	0.145	0.069	2.133	0.033	NS
Hierarchical -> Top Management	0.220	0.063	3.550	0.000	*
Hierarchical -> Workforce Management	0.183	0.059	3.158	0.002	*
Marketing -> Customer Focus	0.053	0.057	0.963	0.336	NS
Marketing -> Measurement Analysis	0.184	0.064	2.870	0.004	**
Marketing -> Process Management	0.381	0.053	7.179	0.000	***
Marketing -> Strategic Planning	0.260	0.062	4.179	0.000	***
Marketing -> Top Management	0.149	0.060	2.481	0.013	**
Marketing -> Workforce Management	0.255	0.053	4.740	0.000	***

*Source: Field Study (2017) Note: NS = not significant. a. Bootstrap confidence intervals for 10% probability of error (a= 0.10). *p < .10. **p < .05. ***p < .01, NSP= Not supported, SP=Supported*

To determine if a coefficient is significant depends ultimately on its standard errors, this can be obtained by means of bootstrapping.

The bootstrapping standard error allows the T value to be computed. When the t value is larger than the critical value, the coefficient can be interpreted as significant. To test for the statistical significance of SmartPls paths, the bootstrapping technique is used to resample the cases to determine the t statistics value that indicates the level of significance of the paths. table 4 shows the t statistics and p value results associated with each path result for the firms. A total number 24 path relationships exist between the four subculture types and the six TQM practices. A total number of sixteen significant and eight non-significant relationships exists between the exogenous and the endogenous variables. The clan subculture has six significant relationship with measurement analysis, process management, strategic planning, customer focus, workforce management and top management, the adhocracy subculture has one significant relationships with strategic planning, the hierarchical subculture has four significant relationships with customer focus, top management, workforce management and measurement analysis while the marketing subculture has five significant relationships with process management, top management, customer focus, measurement analysis and workforce management practice. The empirical results of the paths significance show that the four subcultural types influence the different TQM Practices however the result of indicates that the clan subculture is significantly related to all six TQM practices and this finding confirms the importance of the clan subculture for TQM implementation in the firms.

Predictive relevance Q2: According to Cohen (1988), Q2 results can be interpreted as 0.02 represents a "small" predictive relevance, .15 represents a "medium" predictive relevance, and .35 represents a "high" predictive relevance. Based on this, table 1 shows that strategic planning has a Q2 value of 0.288 (medium), process management has a Q2 value of 0.219, workforce management has a Q2 value of 0.270 (medium), measurement analysis has a Q2 value of 0.193 (medium), top management has a Q2 value of 0.230 (medium) and customer focus has a Q2 value of 0.273 (medium)

DISCUSSION OF RESULTS

The empirical results of this study show that different subculture types influence different TQM practices. The findings indicate that the clan subculture and the marketing subcultures are the predominant subculture types in Nigerian construction firms, the clan subculture is significantly related with the six TQM practices while the marketing subculture is significantly related with five out of the six TQM practices. The importance of the clan subculture for TQM implementation is reported in of Zu et al (2009), Kairimi et al (2012), Haffar et al (2013),Marofi et al (2012), Naor et al (2008) and the importance of the Marketing subculture for TQM implementation is reported in Willar et al (2016), Igo & Skitmore (2006). The clan subculture is focused on internal relationships and is flexible. market culture is a results-oriented workplace. Leaders are hard-driving producers and competitors. They are tough and demanding. The results presented in table 2 also indicates that construction firms in Nigeria supports all the hypothesized relationships between the subcultures and TQM practices. the findings support the findings of Harinarian, Bornman & Botha (2012), Arditi Nayak & Damsi (2017).

CONCLUSION AND RECOMMENDATIONS

Culture has been recognized in literature as critical for TQM implementation, however previous research view organisations has having one culture type. Previous research has viewed organisations as having one culture type, however, few organisations are featured by only one culture type, rather the profile consists of subculture types. This study has examined the relationship between each subculture type and each TQM practice by using the Structural equation modelling to investigate the possible relationships that exists between organisational subcultures and TQM practices. this study supports the all the theoretical relationships that exist between the clan subculture and customer focus practice, workforce management and process management. The adhocracy subculture also has a positive relationship with customer focus, marketing subculture and customer focus practice, workforce management practice and process management practice. The relationships between the hierarchical subculture and workforce management is also positive thus construction organisations in Nigeria supports all the theoretical relationships between organisational subculture and TQM practices. To successfully implement TQM Construction firms in Nigeria should emphasize the clan and marketing subculture types. The clan subculture has positive significant relationships with all the six TQM practices while the marketing subculture has five significant positive relationships with TQM practices. Effective TQM implementation requires a careful consideration of the subcultural profile of each firm before implementing. Managers need to assess the subcultural values of their firms and develop necessary action policies and plan ahead to create a supportive subcultural environment to ensure successful implementation. The instrument for data collection used in this research is a pre-TQM tool, this should be adopted for periodic/continuous self-assessment

REFERENCES

Akinola, J. A., Akinderawo, O. F., & Olatunji, F. O. (2012). Impact of TQM on Nigerian Construction Firms. Paper presented at the West Africa Built Environment Research (WABER) Conference, Abuja

Arditi, D., Nayak, S. & Damsi, A. (2017) effect of organisational culture on delay in construction. international journal of project management 2017(35) pp 136-147

Baird, K., Jia, K. H., & Reeve, R. (2011). The relationship between organisational culture, total quality management practices and operational performance. International journal of operations and production management, 31(7), 789-814.

Cadden, T., Marshall, D., Cao, G., 2013. Opposites attract: organisational culture and supply chain performance. Supply Chain Manag. 18 (1), 86–103.

Cameron , K. S., & Quinn, R. E. (2006). Diagnosing and Changing Organisational Culture. San Fransisco.: Jossey-Bass.

Cochran W. G. (1977) Sampling Techniques. 3rd Edition . John Weiley & Sons. Canada

Gambi, L. N., M C Gerolamo, & Carpinetti, L. C. R. (2013). A theoretical Model of the Relationship between Organisational Culture and Quality Management Techniques. Procedia. Social and Behavioural Sciences, 81(1), 334-339.

Gimenez-Espin, Jiménez-Jiménez, D., & Martínez-Costa, M. (2013). Organizational culture for total quality management. Total Quality Management & Business Excellence, 24(5-6).

Green, T. J. (2012). TQM and organisational culture: How do they link? Total Quality Management & Business Excellence, 23(2), 141-157.

Haffar, M., Al-Karaghouli, W., & Ghoniem, A. (2013). The Mediating Effect of individual Readiness for change in the relationship between organisational culture and TQM. Total quality management, 24(6), 693-706.

Harinarian, N., Bornman, C. L. & Botha, M. (2012) Organisational culture of the South African Construction Industry. Engineering, property and development vol 3(1). Pp 22-43

Igo, T., Skitmore, M. (2006) diagnosing the organisational cultue of Australian engineering consultancy using the CVF. Construction innovation, vol 6 issue 2. Pp121-139

Ivana, N. S., & Martina, H. (2016). Organisational Culutre of the Croatian Construction Industry. Engineering, Construction and Architectural Management, 23(2), 237-260.

Jayaram, J., Ahire, S.L., Dreyfus, P., 2010. Contingency relationships of firm size, TQM duration, unionization, and industry context on TQM implementation – a focus on total effects. J. Oper. Manag. 28 (4), 345–356.

Jimenez-Jimenez, D. Martinez-Costa M, Martinez-Lorente, A. R., & Rabeh, H. A. D. (2014). Total Quality Management performance in Multinational Companies. A learning Perspective. The TQM journal, 27(3), 328-340.

Juran, J.M. and Gryna, F.M. (1980), Quality Planning and Analysis, 2nd ed., McGraw-Hill, New York, NY

Kaluarachchi, K.A.S.P., 2010. Organizational culture and total quality management practices: a Sri Lankan case. TQM J. 22 (1), 41–55. Kannan, V.R., Tan, K.C., 2005. Just in time, total quality management, and supply chain management: understanding their linkages and impact on business performance. Omega 33 (2), 153–162.

Lapina, I., Kairisa, I., & Aramina, D. (2015). Role of Organisational Culture in the Quality Management of University. Social and Behavioral Sciences, 213(1), 770-784.

Levy, P.S. & Lemeshow, S. (2011). Sampling of Populations: MEthods and application. 4th Edition. John Weiley and Sons. New Jersy

Liu, Z.J, Zhang, D. & Shroeder, R.G (2011) costomisation of quality practices: the impact of quality culture. International journal of quality and reliability management vol 1 no 28 pp 263-279

Lok, P., Rhodes, J., & Westwood, B. (2011). The mediating role of organizational subcultures in health care organizations. Journal of Health organisation and management, 25(5), 505-525.

Mathew, J., 2007. The relationship of organisational culture with productivity and quality: a study of Indian software organisations. Empl. Relat. 29 (6), 677–695.

Nukic, I. S., Matotek, J. (2014). Importance and trends of Organisational culture in construction in eastern Croatia. Economic view 37(1) pp 25-40

Oney-Yacizi, E., Gritili, H., Topcu-Oraz, G., & Acar, E. (2007). Organisational Culture: the case of Turkish Construction Industry. Engineering. Construction and Architectural Management, 14(6), 519-531.

Ooi, K., Lin, B., Tan, B., & Chong, A. Y. (2011). Are TQM practices supporting customer satisfaction and service quality? Journal of services, Marketing, 25(6), 410-419.

Prajogo, D. I., & McDermott, C. M. (2005). The relationship between Total Quality Management practices and Organisational Culture. International journal of operations and production management, 25(11), 1101-1122.

Prakaash, C. Baura, M.K, Balon, V. (2015). Priotizing TQM enablers to improve Indian airline performance under fuzzy environment. Industrial engineering journal 8(8) Pp. 28-34

Rad, A. M. M. (2006). The impact of Organisational culture on the successful implementation of Total Quality Management. The TQM Magazine, 18(6), 606-625.

Ramezdeen R. (2015). Organizational culture in construction: an employer's perspective. The Australian journal of construction economics and building. Vol 18 no 1 pp 48-69.

Reid, R. D., & Sanders, N. R. (2012). Operations Management an Integrated approach (Fourth ed.). United State of America: John Weiley and Sons.

Rodan. J. L, Leal-Rodriguez, A.L., Leal, A.G (2012) The influence of organisational culture on the Total Quality Management programme performance. Investigaciones Europeas de direction y economi de la emprasa 18 (2012) pp 183-189

Schroeder, R.G., Linderman, K., Liedtke, C. & Choo, A.S. (2008) "Six Sigma: Definition and underlying theory", Journal of Operations Management, vol. 26, no. 4, pp. 536-554.

Solatani, E. Sayed, J.R., Lai, P (2008) a review of the theory and practice of quality management: an integrated framework. Total quality management &Business excellence. Vol 19 no 8 pp 461-479

Valmohammadi, C ROshamir, S. (2015). The guidelines of improvement: Relations among organizational culture, TQM and performance. Int. J. Production Economics 164(2015) pp 167-178

Zu, X., Robbins, T.L., Fredendall, L.D., 2010. Mapping the critical links between organizational culture and TQM/Six Sigma practices. Int. J. Prod. Econ. 123 (1), 86–106.