



## Review Article

# The impact of organizational culture on total quality management in SMEs in Nigeria



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## ABSTRACT

The goal of this exploration is to observationally test the connection between total quality management and SMEs' performance. Specifically, it looks at whether organizational culture (OC) has an interceding impact on the TQM-SMEs performance relationship. Established on the literature review of TQM, OC and SMEs performance, the theoretical model for this investigation was formed. A self-controlled survey was utilized to gather information from the SMEs owners-managers in the South-western region of Nigeria. In determining the relationship, SEM-PLS 3.0 was utilized. Measurable results add to the literature by showing a positive direct impact of TQM and OC on SMEs' performance, and a critical and positive aberrant impact of TQM on SMEs' performance through OC. The quantitative cross-sectional research configuration explored an example of assembling SMEs. Subjective methods or a contextual investigation approach for additional data examination could be utilized for subsequent research. The results of this exploration give awareness into SMEs' owners-managers in the present unique manufacturing setting, concentrating on TQM as an instrument for improving their performance. The outcomes can help SMEs by giving direction with regards to the OC, on account of its impact on the effective execution of TQM, in this way improving the dimension of performance. The examination expands the TQM literature with an extensive comprehension of TQM from the point of view of SMEs in Nigeria. It fills the void in observational examinations that research the joint impact of TQM and OC on SMEs' performance.

## 1. Introduction

By means of the swift development of the international economy, companies are confronting expanding pressure to accomplish and keep up functional distinction to advance their general performance and competitiveness (Gherardini et al., 2017; Kirkham et al., 2014). Internationally, organization, additionally, consistently encounter a changing in organizational culture, competitive market, with an expanded spotlight on progress in efficiency, quality, consumer loyalty, innovation in high-tech, political and fiscal unpredictability (Gadenne and Sharma, 2009; Maheshwari and Vohra, 2015). More than at any other time, organizations today can never again depend on their present business forms in an exceedingly competitive marketplace (Dubey and Gunasekaran, 2015; Ibidunni et al., 2017). They need to embrace and put into action new operation management performs, in order to continue to exists, which have been successful over the years (Zakuan et al., 2010). A

standout amongst the most well-known types of contemporary operations management practice is Total Quality Management (TQM), which has gained widespread attention from both industry and academics over the last two decades Sinha (Haffar et al., 2017; Jimoh et al., 2019; Panuwatwanich and Nguyen, 2017; Salas-Arbeláez et al., 2017; Sinha and Dhall, 2018).

TQM is an integrative firm-wide management philosophy aimed at continuously improving the quality of the processes, products and services by focusing on meeting or exceeding customer expectations to enhance customer satisfaction and organizational performance (Baird et al., 2011; García-Bernal and Ramírez-Alesón, 2015; Sadikoglu and Olcay, 2014). Therefore, organizations had implemented TQM to improve their business success by differentiating their products and gaining a competitive position in the market (Herzallah et al., 2014; Pérez and Gutiérrez Gutiérrez, 2013). This leads to positive results with increasingly higher profits, market share and superior performance (Kim

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et al., 2012; Santos-Vijande and Álvarez-González, 2007). Recent researchers have found total quality management implementation has a momentous association with firms' performance (Al-Dhaafri et al., 2016; Kanapathy et al., 2017; Sinha and Dhall, 2018). However, others have found no or negative correlations between TQM and performance (Duarte et al., 2011; Yeung and Chan, 1998). Indeed, some studies have indicated that three-quarters of TQM implementations have problems and fail to achieve any results, causing considerable financial loss and threatening the organization's survival (Haffar et al., 2017; Valmohammadi and Roshanzamir, 2015). These mixed results lead to the question about the compatibility of the TQM-organizational performance relationship, as well as what elements can contribute to the success of this association. This view supported by (Nair, 2006, p. 951), "the nature of these indirect and interactive relations among QM practices and performance lack generalized agreement among researchers".

The literature in the field of TQM reports that the organizational culture (OC) is recognized as one of the utmost significant requirements for the achievement or disappointment of total quality management implementation in enhancing performance (Gimenez-Espin et al., 2013; Green, 2012; Haffar et al., 2013; Zu et al., 2010). According to Al-Bourini et al. (2013); Kaluarachchi (2010), SME owners and bosses find it problematic to harmonize the exercise of OC with their total quality management undertakings, largely because of the problematic characteristics of OC. Firms have been reported to spend an average of £250 million in ineffectively developing quality cultures, more than enterprises with a successful quality culture (Srinivasan and Kurey, 2014). In this case, TQM should focus on enhancing the spirit of managerial leadership among the members of the organization rather than on the process of long-term supervision and orientation, to encourage pride in workmanship, use of work teams, drive out fear and promote participatory management (Abiola-Falemu et al., 2008; Ranjan Kumar and Sanakaran, 2007). A change of OC affects the attitudes of employees and is important to the successful implementation of TQM (Gimenez-Espin et al., 2013; Mohammad Mosadegh Rad, 2006).

In fact, OC can build a suitable environment which influences both operational performance and business (Cadden et al., 2013). Numerous, even opposing, kinds of harmonious OC has developed (Baird et al., 2011; Kanapathy et al., 2017), and these differences lead to the question of the impact of OC on the link between TQM and performance. This view is supported by (Kanapathy et al., 2017), who suggested examining the mediating role of OC on the relationship between TQM and performance. In particular, there is a deep inherent need to investigate the association between TQM, culture, and performance (Ebrahimi and Sadeghi, 2013). However, there is a dearth of experimental studies examining the association between TQM and performance within the context of small and medium enterprises (SMEs), particularly in developing countries (Imran et al., 2018; Sinha and Dhall, 2018). This research addresses this case by looking into the associations among total quality management, OC and SMEs' performance.

The SMEs sector assumes a fundamental economic function in the advancement and the overall performance of both developed and developing countries (Buli, 2017; Eniola, 2018a). It represents a major source of job creation with minimum cost and contributes to innovation and technological growth (Eniola, 2018b; Eniola and Entebang, 2014, 2017; OECD, 2017). In fact, SMEs represent 90–99% of the world's business enterprises (Eniola and Entebang, 2014), and contribute 67% of self-employment in the labor force Patrice (Muller et al., 2017). In the case of Nigeria, according to the Eniola (2018b); Eniola and Entebang (2017), SMEs made up of 99% of all companies in Nigeria and are accountable for 87 % of the employment in the agriculture and manufacturing sectors. However, they contribute only 10% to the national GDP, which is low when compared to other developing and developed economies (Eniola, 2014). This poor performance of SMEs in Nigeria, especially when compared with other countries, is a serious issue and a reason for researchers to investigate the key factors behind the situation.

More importantly, only a few previous studies have attempted to evaluate the implementation of TQM and its effects in different sectors, for instance in public hospitals (Al-Shdaifat, 2015); telecommunication (Dada and Eniola, 2018); education (Ogunnaike et al., 2014), and the construction industry (Samuel Oludare and Olugboyege, 2016), while there is very limited or no empirical study specifically focusing on the relationship with organizational performance. Hence, this investigation purposes is to add to the research in the newer context of Nigeria.

Based on the above discussion, this research tests the Nigeria SMEs sector and provides empirical evidence concerning this problem. The study objectives are to empirically examine the association between TQM and OC and their effects on SMEs' performance; and the link between TQM and the performance of SMEs (local environment) with the mediating role of OC. It uses the criteria of the MBNQA model to identify six TQM practices Prajogo and Sohal (2006) in Nigeria, as well as the instrument developed by Cameron and Quinn (2013) to evaluate OC. The remainder of this study is arranged as follows. A brief literature review of TQM and performance is presented in the following section. The logic embodied in the literature is then used to build an integrative model to clarify the relationships among TQM, OC and SMEs' performance, according to the proposed hypotheses. Third, the research methodology and hypotheses are discussed, followed by the presentation and discussion of the results. The conclusion identifies the limitations of the study and avenues for future work.

## 2. Theoretical background and hypotheses development

### 2.1. Theory of resource-based view (RBV)

As indicated by the resource-based view (RBV), a firm's sustainable performance advantage is secured through rare resources of economic value, unique and cannot easily be replicated, imitated or substituted (Barney, 1991). Tena, Llusar, and Puig (2001) says total quality management can activate a matchless competitive advantage because of its capacity to energize schedules and rules inside the organization, which make it hard for potential imitators to assemble resources for the successful multiplication of a similar procedure. These unique combinations of physical, human and organizational resources improve performance and create a sustainable competitive advantage (Barney, 1991; Miller and Shamsie, 1996).

Likely the hypothetical connection that exists between competitive advantage and performance, it is maybe not very astonishing that it has been guaranteed that total quality management or comparative quality management practices like OC can be utilized to create competitive advantage (Curkovic and Pagell, 1999). It has additionally been guaranteed that TQM leads to sustainability of advantage (Flynn et al., 2007).

Barney et al. (2011) reiterate that RBV of the firm is the foundation upon which competitive advantage and performance can be forecasted. In this scenario, achieving competitive advantage through TQM depends on how well resources are assigned to several activities to address gaps in the market. The emphasis of RBV is on harnessing resources that are intangible particularly human resources to gain a competitive advantage over rival firms. TQM is perceived as a strategy since it is at the enterprise level where competitive advantage happens. Be that as it may, Luo (2013) sight that total quality management delivers a merge framework that conveys a scope of good management practices" to manage at the same time. The structure in this way gives a specific circumstance and heading to the improvement of the fundamental intangible resources. All in all, the inquiry still remains: Does total quality management have the potential for producing a competitive advantage? Powell (1995) empirical result indicated that TQM can produce a competitive advantage. As cited in Reed et al. (2000) researchers agreed that the motivation behind quality management (QM) is to diminish costs and advance consumer loyalty to enhance SMEs performance.

TQM and OC have equally been regarded as important unique and intangible organizational resources and capabilities. If utilized efficiently

and effectively, can contribute to competitive advantage (Gambi et al., 2015; Imran et al., 2018; Neyestani and Juanzon, 2016; Valmohammadi and Roshanzamir, 2015), and thereby lead to improved performance by SMEs.

## 2.2. Total quality management and performance

In the operations management research, total quality management is considered as a firm-wide philosophy of management looking for continuous improvement in every business operation through the concept of total quality from resource provision and acquisition to providing customer support and after-sales service (Kaynak, 2003; Munizu, 2013). Performance indicates the capacity of the operational system and its ability to achieve the competitive priorities previously identified, for example, quality, the price of the service or product and the time of delivery (Jagoda and Kiridena, 2015). That means that if the firm is to achieve higher long-term performance it should build and maintain mutually beneficial links with customers (Narver and Slater, 1990). In order to meet customer needs and offer superior customer value, through alignment of the firm's operations and understanding, sharing and responding to customers, the organization must adopt TQM initiatives (Benavides-Velasco et al., 2014; Wang et al., 2012). TQM can effectively be embraced by both manufacturing and service sectors (Claver-Cortés et al., 2008; Nair, 2006). Numerous studies refer to TQM as a source of competitive advantage and enhanced performance (Calvo-Mora et al., 2014; Nair, 2006; Zakuan et al., 2010). Firms adopting TQM practices achieve competitive advantage better than those that do not (Valmohammadi and Roshanzamir, 2015). According to Nair (2006), TQM practices are essential and substantial for effective management as well as the firm's competitive survival. Obviously, if the organization managers have highly quality-oriented, thus leads to assuming that employees within the organization show a higher quality orientation (Heine et al., 2016; Ina, 2016). Meanwhile, quality-oriented firms through confirming the quality in all the organizational functions achieve higher performance (Ina, 2016). Organizations that focus on satisfying customers' needs, encourage and involve workers to accomplish quality product/service and spotlight on continuous improvement are probably going to outflank competitors (Joiner, 2007). Therefore, the most important purpose of TQM practices is improving firms' performance, which in turn provides the motives for managers to continue adopting TQM practices in their organizations.

While some empirical studies have shown that TQM and organizational performance are positively related (Al-Dhaafri et al., 2016; Gimenez-Espin et al., 2013; Ibdunni et al., 2017; Nair, 2006; Panuwatwanich et al., 2017; Valmohammadi and Roshanzamir, 2015; Wang et al., 2012), others such as (Duarte et al., 2011; Su et al., 2008), found no effect of TQM on performance. Forker (1997); McCabe and Wilkinson (1998); Yeung and Chan (1998) even found a negative relationship between TQM and business performance. The main reasons for these different results may include use of different TQM measures, measures of different performance, a lack of training and support of management and ineffective application, as well as being conducted in different contexts or countries (Kaynak, 2003; Nair, 2006; Tarf et al., 2010).

In the context of SMEs, the few investigations have empirically studied the effect of TQM on performance found inconsistent results. For instance, some concluded that TQM implementation the organizational performance of SMEs (Demirbag et al., 2006; Herzallah et al., 2014; Sahoo and Yadav, 2017, 2018; Salaheldin, 2009). Others reported no effect of TQM on SMEs performance (Kober et al., 2012; Prajogo and Brown, 2006; Prajogo and Sohal, 2006). Because of the inconsistency of these findings, further investigation of the links between TQM and SMEs' performance is required.

Based on these arguments, this research proposes that SMEs' adoption of TQM may improve performance, leading to the following hypothesis:

**H1.** TQM positively affects SMEs' performance.

## 2.3. TQM, OC and performance relationship

The extensive review of the literature reported several different definitions of OC, although there is a consensus regarding group values, beliefs, practices, and assumptions which guide the members of the organization in day-to-day work activities (Cameron and Quinn, 2013; Schneider and Barbera, 2014). In line with that, Schein (2010) defined OC as a pattern of shared basic assumptions invented, discovered or developed by a given group as it learns to solve its problems of external adaptation and internal integration thus, newcomers must be taught OC as the appropriate method to think, feel and perceive a link to those problems. Thus, the OC is considered as an important instrument for managers to guide the path for their organizations (Daft and Lane, 2018). This leads to creating a suitable environment, influencing together operational and business organizational accomplishment (Cadden et al., 2013). Schein et al. (2018) supported this argument, stressing the real importance of leaders within the organization stems from the establishment and management of culture in order to create a culture of workplace suitability, which can lead to improved employee satisfaction and organizational performance. OC is also a critical factor in facilitating and accepting the process of change as it affects the implementation of new initiatives such as TQM in order to increase effectiveness (Cameron and Quinn, 2013).

This view is supported by Kaluarachchi (2010); Mohammad Mosadegh Rad (2006) a suitable OC is one of the key requirements for the successful implementation of TQM for all firms. This means that if there is no match or harmonization between TQM and OC, a positive outcome is less likely (Gambi et al., 2015). In other words, often TQM implementation fails to realize anticipated findings because of incompatibility with OC (Ina, 2016). Accordingly, researchers have claimed that TQM practices and OC are complementary to each other (Yong and Pheng, 2008), and especially in the context of organizational performance (Jabnoun and Sedrani, 2005).

Moreover, several researchers have built models for OC in literature. One of the most common models as recommended by (Cameron and Quinn, 2013) to assess OC is the competing values framework (CVF). Established on four dimensions, the CVF is of a clan, adhocracy, market, and hierarchical culture. This framework also refers to whether an organization has a predominant internal or external focus and whether it strives for flexibility and individuality or stability and control.

Meanwhile, numerous studies indicate empirical associations between TQM practices and OC (Gimenez-Espin et al., 2013; Haffar et al., 2013; Sinha et al., 2016; Valmohammadi and Roshanzamir, 2015; Zu et al., 2010). On the other front, many studies support the positive and significant influence of OC on the firm's performance (Al-Bahussin and El-Garaihy, 2013; Gorondutse and Abdullah, 2016; Valmohammadi and Roshanzamir, 2015; Yarbrough et al., 2011). Surprisingly, little empirical research has paid attention to combining TQM and OC as key concepts with performance. Both TQM and OC have been equally considered as strategies and practices to create competitive advantage and significant drivers of best performance (Jinhui Wu et al., 2011; Kaur and Sharma, 2014; Mohammad Mosadegh Rad, 2006; Schein, 1984; Schein et al., 2018; Valmohammadi, 2011; Valmohammadi and Roshanzamir, 2015). In keeping with the above discussion, the following hypotheses are raised:

**H2.** TQM is significantly related to OC.

**H3.** OC is significantly related to SMEs' performance.

**H4.** OC mediates the relationship between TQM and SMEs' performance.

## 3. Methodology

As specified above, this research focuses on investigating the direct and indirect impacts of TQM on SMEs' performance, mediated through

the OC. Cross-sectional study design and a quantitative methodological approach were used, with a questionnaire designed to collect data from respondents (Kerlinger and Lee, 2007). The unit of analysis of the research was the manager/owner of the SMEs. The population was the total number of 6,009 manufacturing based SMEs in Nigeria as of 2012 (MSME Survey, 2012). One-third of the SMEs in the Manufacturing sector is situated in the southwestern region of Nigeria which has common culture and homogeneity. Based on Krejcie and Morgan (1970) guidelines for determining sample size, the samples size is 364. According to Hair (2017), in order to solve the non-response issue and to reduce error, the initial sample size should be doubled (728 questionnaires). Equally, the sample size ought to be not further off than five to ten times the digit of examine variables in multivariate research (Hair et al., 2019). The cluster sampling technique was utilized in this study as it has advantages such as cost, accuracy, simplicity, lack of bias, and the ability to obtain generalizable results. A designed questionnaire with the help of research assistants was utilized to gather data from the SMEs owner-managers in the manufacturing area operating in south-western Nigeria. Descriptive analysis is applied to the demographics data. This is imperative as it assists in decides the distribution rationality. The data were descriptively examined as far as to the measure of frequency, measures of central tendency and measures of variability. A measure of frequency utilized in the study is the count and percentage; the central tendency incorporates the meanwhile the measure of variability incorporates standard deviation.

Measurement scale items from the previous literature were adapted for the constructs. Total quality management analysis was attuned from various studies such as those employed by Anderson and Sohal (1999); Samson and Terziovski (1999); Wang et al. (2012) while OC measurements have been adapted from Cameron and Quinn (2013); Valmohammadi and Roshanzamir (2015); likewise, organizational

**Table 1**  
Respondents' demographics.

Items	Frequency	Percentage
<b>Work Status:</b>		
Owner	320	88
Manager	44	12
<b>Owner/Manager Years of Experience:</b>		
Under 1yr	40	11
1–5 yrs.	80	22
6–10 yrs.	80	22
11–15 yrs.	113	31
More than 15 yrs.	51	14
<b>Years of Operation:</b>		
Under 5 years	36	10
5–10 years	51	14
11–15 years	51	14
16–20 years	131	36
21 years and above	95	26
<b>Number of employee in your organization:</b>		
Above 10 Employees	226	62
11–49	40	11
50–75	18	5
76–100	22	6
101–125	18	5
126–150	15	4
151–175	26	7
176–200	7	2
<b>Type of industry:</b>		
Food and beverage	113	31
Packaging	29	8
Plastic products	95	26
Wood and furniture	15	4
Malt products	44	12
Textile, garments and leather	26	7
Chemical and petrochemical	18	5
Electrical and electronics	18	5
Machinery and equipment	7	2

performance measurements have been adapted from Kaplan et al. (2018); Venkatraman and Ramanujam (1986). Items were measured using seven-point Likert scales (considered more efficient by Cavana et al., 2001; Churchill and Peter, 1984) for TQM and OC. With respect to items of performance, also using a seven-point Likert scale, respondents were requested to assess the level of performance of their firms over the past three years. This study used SPSS version 22 and PLS-SEM software 3.2 for data analyses which give equal results that reflect the theory.

Ethical consent was conceded for the approval of our study tool by the Landmark University ethical committee in gathering and investigating the study data.

## 4. Results

Owner/manager in the manufacturing sector comprises of 728 SMEs were administered questionnaires. However, 364 questionnaires were usable and found to be valid for further analysis after removing outliers. The final rate of response was 50% of the population. The survey was conducted from early April to the end of October 2018, and during the data collection period, statistical analysis to detect errors in all the constructs was applied. Performance is assessed for validity, collinearity bone of contention and significance and relevance of indicators by checking outer weights and outer loadings formative construct in the PLS path model. As a rule of thumb, we necessitate to take in a VIF of 5 or lower (i.e., the tolerance level of 0.2 or higher) to avoid the collinearity problem. There is a VIF value <5 for all indicators. Therefore, there is no cause for concern on collinearity issue between the indicators (Akintimehin et al., 2019; Eniola, 2018b; Eniola and Entebang, 2017).

### 4.1. Demographics of respondents

The results of the descriptive analysis of demographics are presented in Table 1. The work status of the respondents indicated that 88% were owners of SMEs, and 12% manages. With regard to the years of experience within the company, 31% of the respondents have experience of 11–15 years, indicating that they are knowledgeable and experienced in the situation and processes of their organizations. 22% had 1–5 years of experience and a similar percentage (22%) 6–10 years. Those with more than 15 years of operation were 14% and less than 5 years of operation with 10%. 76% of the enterprises had been in operation for more than 11 years, suggesting maturity. In identifying the size of the organizations, 73% had fewer than 50 employees. Lastly, by type of industry, 31% of the companies were in food and beverages, 26% plastic products, 12% malt products, 8% packaging, 7% textiles, garments and leather, 5% electrical and electronics, 5% chemicals and petrochemicals, 4% wood and furniture, and 2% machinery and equipment. By and large, the respondents make available sufficient data reflecting varied economic backgrounds.

### 4.2. Descriptive analysis

Descriptive statistics for TQM, OC and performance are presented in Table 2. The mean of TQM is 5.65, with a standard deviation of 0.53. For OC, the mean is 5.59, with a standard deviation of 0.55. Performance obtained a mean of 5.67, with a standard deviation of 0.64.

### 4.3. The measurement model: "outer model"

The research model was analyzed using PLS structural equation

**Table 2**  
Descriptive analysis.

Constructs	Mean	Standard deviation	Minimum	Maximum
TQM	5.65	0.53	1	7
OC	5.59	0.55	1	7
Performance	5.67	0.64	1	7



modelling (SEM), specifically through SmartPLS 3.2 (Ringle et al., 2015). The PLS technique is used here for the analysis of the main and mediating results. A PLS model analysis is presented using a two-step technique; the first step is to evaluate the measurement model (validity and reliability of the measures); the second step is structural model examination (Fernandes, 2012; Hair et al., 2017; Ramayah et al., 2011) Following Hair et al. (2017), a bootstrapping method was used to determine the path coefficients significant and the loadings.

As indicated by Hair et al. (2012) in evaluating the measurement model, convergent validity was tested via the factor loadings, composite reliability and average variance extracted (AVE). As shown in Table 3, factor loadings of all items and reliability of indicator all exceeded 0.7 (Hulland, 1999). As alpha coefficients, the cut-off values at 0.7 and 0.5 were surpassed by CRs and AVEs respectively (Hair et al., 2017). Therefore, the results from the outer model confirmed that all the measurements loaded greater on their hypothesized constructs than on other constructs; all values for AVE latent factors were higher than the cutoff value for loadings at 0.5, thus confirming the convergent validity (Chin, 2010). This study makes use of CR in the reliability test rather than Cronbach Alpha (CA). Cronbach Alpha has been criticized for its lower bound value which underestimates the true reliability (Peterson and Kim, 2013).

Discriminant validity was evaluated through computing the AVE square root for every factor. Discriminant validity was achieved when AVE square root were higher than the association among the factors in the model (Chin, 2010; Fornell and Larcker, 1981; Hair et al., 2017). The significance of bold, (see Table 4), is that the reflective construct Ac has a value of 0.85 and Nfin has a value of 0.91 for the square root of its AVE, which needs to be compared with all correlation values in the column of Ac and row of Nfin. While for the remainder of the constructs from Cc to Sp the correlations are considered in both the row and column. Generally, the reflective constructs of the bold are all higher than the correlations of these constructs with other latent variables in the path model, therefore indicating all constructs are valid measures of unique concepts.

Tables 3 and 4 show that the findings of the measurement model were statistically acceptable in terms of reliability, convergent validity, and discriminant validity.

The findings of this research provided empirical evidence for the suggested concepts of TQM, OC and performance of SMEs as reflective second-order constructs. This procedure is consistent with previous research (Calvo-Mora et al., 2014; Kanapathy et al., 2017; Sinha et al., 2016). Moreover, the research aim is to examine the effect of TQM and OC as one single construct to better understand how they influence other variables. Concerning SMEs' performance, was applied as a single construct rather than multi-dimensions (financial and non-financial) in the statistical analysis in order to reverse their total performance (Jusoh, 2008).

4.4. Evaluation of the structural "inner" model

The next procedure in PLS-SEM is to evaluate the structural model, having built up the validity and reliability of the dimension archetypal. The most crucial standard for structural model assessment is R<sup>2</sup>, as the target of the prediction-oriented PLS-SEM approach is to explain the variance of endogenous latent variables and thus R<sup>2</sup> values of the core aim constructs have to be high (Hair et al., 2017, 2019); an R<sup>2</sup> value for endogenous latent variables in the structural model of 0.75 is substantial, 0.50 is moderate, and 0.25 is weak. R<sup>2</sup> was establish to be 0.578, based on the outcomes of estimating a PLS algorithm, confirming that TQM and OC represented 57.8% of the variance in SMEs' performance, which is in the moderate range. The R<sup>2</sup> value for OC was 0.404, proposing that 40.4% of the variance in OC could be clarified via TQM, although in the weak range.

Meanwhile, Henseler et al. (2009) proposed utilizing the blindfolding method to estimate the model's predictive ability. This also "emphasized that Stone-Geisser's test fits soft modeling like a hand in glove; it is

Table 3  
Convergent validity.

Constructs	Item	Loading	Cronbach's alpha	CR	AVE	
TQM	LS1	0.89	0.95	0.96	0.80	
	LS2	0.91				
	LS3	0.92				
	LS4	0.90				
	LS5	0.88				
	LS6	0.86				
	Cf	Cf1	0.82	0.94	0.95	0.75
		Cf2	0.89			
		Cf3	0.90			
		Cf4	0.91			
		Cf5	0.88			
		Cf6	0.85			
	Sp	Sp1	0.83	0.92	0.94	0.71
		Sp2	0.86			
		Sp3	0.90			
		Sp4	0.89			
		Sp5	0.84			
		Sp6	0.73			
	Hrm	Hrm1	0.82	0.92	0.94	0.71
		Hrm2	0.85			
		Hrm3	0.87			
Hrm4		0.88				
Hrm5		0.87				
Hrm6		0.78				
Infa	Infa1	0.82	0.94	0.95	0.73	
	Infa2	0.86				
	Infa3	0.86				
	Infa4	0.88				
	Infa5	0.87				
	Infa6	0.86				
	Infa7	0.84				
Pm	Pm1	0.84	0.92	0.94	0.76	
	Pm2	0.89				
	Pm3	0.90				
	Pm4	0.89				
	Pm5	0.83				
Organizational Culture	Cc1	0.85	0.92	0.94	0.72	
	Cc2	0.88				
	Cc3	0.86				
	Cc4	0.88				
	Cc5	0.83				
	Cc6	0.78				
	Ac1	0.79				
	Ac2	0.85				
	Ac3	0.88				
	Ac4	0.88				
	Ac5	0.85				
Ac6	0.82					
Mc	Mc1	0.77	0.89	0.92	0.66	
	Mc2	0.83				
	Mc3	0.85				
	Mc4	0.85				
	Mc5	0.85				
	Mc6	0.73				
Hc	Hc1	0.78	0.91	0.93	0.68	
	Hc2	0.83				
	Hc3	0.86				
	Hc4	0.86				
	Hc5	0.84				
	Hc6	0.80				
Performance	Fn1	0.90	0.92	0.94	0.79	
	Fn2	0.91				
	Fn3	0.91				
	Fn4	0.85				
	Nfn1	0.89				
	Nfn2	0.93				
	Nfn3	0.91				

LS = Leadership; Cf = Customer focus; Sp = Strategic Planning; Hrm = Human resource management; Infa = Information and analysis; Pm = Process management; Cc = Clan Culture; Ac = Adhocracy Culture; Mc = Market Culture; Hc = Hierarchy Culture; Fn = Financial; Nfn = Non-financial.

**Table 4**  
Fornell-Larker discriminant validity.

	Ac	Cc	Cf	Fn	Hc	Hrm	Infa	Ls	Mc	Pm	Sp	Nfin
Ac	<b>0.85</b>											
Cc	0.54	<b>0.85</b>										
Cf	0.42	0.43	<b>0.87</b>									
Fn	0.50	0.47	0.53	<b>0.89</b>								
Hc	0.53	0.45	0.49	0.55	<b>0.83</b>							
Hrm	0.45	0.39	0.61	0.45	0.46	<b>0.84</b>						
Infa	0.44	0.44	0.64	0.52	0.54	0.60	<b>0.85</b>					
Ls	0.47	0.43	0.67	0.48	0.50	0.60	0.59	<b>0.89</b>				
Mc	0.53	0.42	0.43	0.49	0.58	0.39	0.40	0.39	<b>0.81</b>			
Pm	0.49	0.41	0.56	0.49	0.50	0.54	0.61	0.60	0.41	<b>0.87</b>		
Sp	0.49	0.49	0.66	0.53	0.50	0.67	0.64	0.59	0.42	0.58	<b>0.84</b>	
Nfin	0.54	0.46	0.54	0.64	0.58	0.54	0.56	0.57	0.51	0.49	0.55	<b>0.91</b>

Ac = Adhocracy Culture; Cc = Clan Culture; Cf = Customer focus; Fn = Financial; Hc = Hierarchy Culture Hrm = Human resource management; Infa = Information and analysis; Ls = Leadership; Pm= Process management; Mc = Market Culture; Sp = Strategic Planning; Nfin = Non-financial.

calculated by the following formula:  $Q^2 = 1 - \frac{\text{the sum of squares of prediction errors (SSE)}}{\text{sum of squares of observations (SSO)}}$  (Fernandes, 2012). According to Hair et al. (2017), when blindfolding is applied to detect  $Q^2$  the cases in the data must not be multiple integers or the number of omissions distanced, or the blindfolding technique gives wrong findings; values from 5 to 10 should be selected. Therefore, the current study estimate the cross-validated redundancy measures for each variable of a dependent by selected nine as the value of d. In line with recommendations by Hair et al. (2017), provided that the cross-redundancy valuation is observed to be higher than nought, the model will have predictive quality; generally, the configuration's predictive relevance cannot be calculated. The cross-validated redundancies for SMEs' accomplishment and OC were observed to be 0.19 and 0.36 correspondingly as the findings revealed in Table 5. Therefore, the outcomes bolster the supposition that the model has an adequate forecast quality.

The final step in a structural model detects the strength of the association between independent and dependent variables, calculated through testing the path coefficients. The research utilized a bootstrap re-sampling technique to estimate standard errors and t-statistics. The path coefficients and bootstrapping results were illustrated in the Table 6. The results reveal that H1 is supported ( $B = 0.45; t = 9.37; p < 0.001$ ). This finding indicates the significance of TQM for improved SMEs performance. The statistical findings suggested that there a significant influence of TQM on SMEs' performance. The implication of this result is that adoption of TQM may improve an SME's performance and create a competitive advantage, thereby enhancing its contribution to economic development. On the other hand, this result suggests that the more SMEs employ TQM initiatives, the more likely they are to become better their performance. This is consistent with previous findings by earlier researchers Kaur and Sharma (2014); Sahoo and Yadav (2017, 2018); Wang et al. (2012) who found significant links between TQM and performance. In their survey of TQM in manufacturing SMEs, Sahoo and Yadav (2018) found a positive association between TQM and manufacturing performance. Herzallah et al. (2014) likewise found a significant and positive indirect impact of TQM on the financial performance of SMEs through competitive strategies.

In the same way, the relationship between TQM and OC shows a significant effect at the 0.001 significance level ( $B = 0.65; t = 13.27; p < 0.001$ ), and thus H2 is supported. this finding is consistent with previous studies which reveal a positive association between TQM and OC based on the CVF (Sinha et al., 2016; Valmohammadi and Roshanzamir, 2015).

**Table 5**  
Predictive relevance.

Total	SSO	SSE	1 – SSE/SSO
SMEs performance	2549	1624.50	0.19
OC	5095	4116.25	0.36

This means that firms should be paying more attention to providing a supportive OC in order to achieve successful implementation of TQM. The result also supports past research which found that TQM should complement OC if the firm is to turn out to be progressively viable and increase performance (Baird et al., 2011; Valmohammadi and Roshanzamir, 2015). Likewise, the results show that OC significantly affects performance ( $B = 0.40; t = 8.36; p < 0.001$ ) indicating that H3 is supported. This linkage, in the Nigeria SMEs context, agrees with previous studies (Al-Bahussin and El-Garaihy, 2013; Gorondutse and Abdullah, 2016; Valmohammadi and Roshanzamir, 2015; Yarbrough et al., 2011), which established that OC has a significant connection with performance. This result gives an explanation that might reflect the powerful effect of OC on both performance and successfulness of organizations in the long term factor in excellence of a firm (Gambi et al., 2015; Schein, 1984; Schein et al., 2018). This research also supports the argument of Hartnell et al. (2011) that the OC based on CVF culture types are not paradoxical or competing, hence, they work, coexist and complement together as one, which in turn to improve performance. This means clan culture focus on concern for employees, communication, collaboration, justice, and social equality backing may give the interior combination expected to fortify market cultures' ability to innovatively address clients' issues, moreover, extrinsic cultures emphasized on supply the provided facts collecting to develop the services/products quality (Cameron and Quinn, 2013; Hartnell et al., 2011) which in turn improve organizational performance. In environments that require unity and a common vision, a strong culture must be linked with a clear focus and homogeneity of effort for higher performance (Cameron and Quinn, 2013). Many authors considered that OC is one of the important drivers to assist organizations to achieve superior performance (Uzkurt et al., 2013).

4.5. Intercession assessment

According to Ramayah et al. (2011), the test for mediation is performed to discover whether the capacity of the mediating variable can significantly load the relationship between a predictor and outcome. Likewise, mediation examines the indirect effect of the independent variable on the dependent variable via a mediator variable. Therefore, to test the mediating effect of OC the study employed the bootstrapping

**Table 6**  
Hypothesis testing.

Hypotheses	Path coefficient	Standard error	T. value	P. value	Decision
H1: TQM - > SP	0.45	0.047	9.37	0.000	Supported
H2:TQM - > OC	0.65	0.048	13.27	0.000	Supported
H3:OC - > SP	0.40	0.048	8.36	0.000	Supported

t > 1.96 \*\* (p < 0.05), t > 2.57 \*\*\* (p < 0.01).

method, as it is more powerful and accurate than other methods (Hair et al., 2017; Hayes, 2018; Zhao et al., 2010). More importantly, a 500 sample of bootstrapping and confidence intervals (CI) with 95% was utilized to examine the indirect effects, I consistent with the (Preacher and Hayes, 2008) method. The results of PLS provide the CI evaluate the implied impact a\*b, and when a 95% CI eliminates zero, there is indication of an implied impact linking X and Y via the intercession with 95% confidence; the intercession was established.

In line with the criterion proposed by (Zhao et al., 2010) this method was employed to investigate the mediation category, whether it is full or partial. They also contended that the implied impact "a\*b" must be critical as the fundamental condition for intercession; when there is insignificant in path c-, there is full intervention. In any case, when the whole procedure a, b and c- have comparative signs, there is a corresponding fractional intervention and when the procedure a, b and c-have various signs, there is a competitive fractional intercession. As presented in Table 7, bootstrapping results regarding the mediating effect of OC on the link between TQM and SMEs' performance show that the CI of the indirect influence of TQM on performance through OC as mediator was ( $\beta = 0.26$ , 95% CI = 0.18 to 0.33); this does not include zero, thus indicating that OC significantly mediates the association between TQM and SMEs' performance. The result likewise reports that the significant direct impact of c- and the direction a\*b are signs and c- were positive, which indicate that OC is a fractional mediator (complementary) on the connection between TQM and performance. Thus, it can be established that H4 is supported. The results indicate that OC partially mediates the causal relationship between TQM and SMEs' performance. The finding also confirms that SMEs need to promote the advantages of TQM practices; OC would have a mediating effect on their performance. This result is supported by the RBV theory, which concluded that organizations can use their internal resources and valuable capabilities, to gain profit as well as the future success (Barney, 1991; Grant, 1991). The findings indicated, in this respect, that when TQM is unified into and incorporated by OC, the organization will create organizational competence in TQM that is difficult for competitors to copy or replicate and thus can be considered as a source of sustainable competitive advantage. In this way, OC assists SMEs owners/managers to influence the style of work of their firm, and affect decision making and behaviours, and consequently improve their firm's performance.

5. Discussion and recommendation

This study, to the best of the researcher knowledge, is the first that looks into the analysis of the intervening role of OC in the association between TQM and SMEs performance in the Nigeria SMEs setting. The organization put into action a TQM procedure accomplishes preferable performance over organization without TQM application (Kaynak, 2003; Samson and Terziovski, 1999). Earlier investigations looking at the impact of TQM on performance yielded blend results. In light of the study structure analyzed and bolstered in this study, affirmed that TQM may improve the OC dependent on the CVF in an organization, thus, improving SMEs performance. With regards to that, the analysis contends that the TQM which focused squarely was lacking. By assuming a

Table 7  
Mediation testing.

H: ON	a	b	c'	Point estimate	Indirect effect 95% CI		Decision
					Lower	Upper	
H4: TQM-> OC-> SP	0.64	0.40	0.44	0.26	0.18	0.33	Partial Mediation

Note: \*\*\*: p < 0.01; \*\*: p < 0.05; \*: p < 0.1. Lower and upper levels of 95% confidence interval.

mediational framework in this study clarifies the component by which TQM is identified with SMEs performance.

The research model gives an understanding of SMEs' performance from the point of view of TQM and OC in Nigeria. In this manner, on the outcomes from the analysis study and the experimental results give functional recommendations. The managerial proposition is that SMEs should put together a strong OC which supplements TQM operations in order to advance prosperous TQM performance. In such a manner, the SMEs owners-managers require realizing the present culture esteems before the application of TQM, this system will aid TQM application should be possible all the more adequately. In the meantime, SMEs owners-managers must reinforce and redistribute a culture which gives more consideration to the client. This methodology centers around the client as a critical point of TQM and part of all-out performance and will raise market results and financial benefit (Valmohammadi and Roshanzamir, 2015). This view is upheld by (Cameron and Quinn, 2013), that client center is a key point in quality strategy and efficiency assumption inside the marketing organizations. Applying these outcomes, guaranteeing continued existence and congruity of the SMEs sector in an extremely competitive business setting; in this manner, the owners-managers may improve performance.

So as to address the customer wants and surpass their expectations, owners-managers in manufacturing SMEs in Nigeria accordingly need to strive for implementation of quality improvement. For this situation, SMEs owners-managers should concentrate on the constant advancement of their workers through preparing to improve their critical thinking and intelligent aptitudes, quality improvement abilities, data evaluation and analytical techniques (Gimenez-Espin et al., 2013; Green, 2012). They ought to likewise perceive the necessities of workers, propelling them through the formation of an appropriate reward scheme and improving their workplace for the TQM successful implementation (Dahlgard-Park, 2012); TQM can't be effectively carried out without the support of the workers. This study is along these lines ready to convey down to earth guide to SMEs in Nigeria about how to implement TQM, by concentrating on a mix of TQM and OC.

6. Conclusion

To outline, this exploration analyzed the impact of TQM on the SMEs performance in Nigeria, with OC as an intervening variable in the relationship. The outcomes demonstrate that TQM has an immediate positive and significant impact on SMEs' performance just as an indirect, significant and positive effect on their performance through OC. The present study is not free from restraints, like every single experimental investigation, which may impact the outcomes; in any case, such imperatives present an open door for future examination. One requirement is the utilization of cross-sectional data structure for the overview, with data put together at a distinct time. The data collected just shows the dimension of the connection between constructs; while causal relations can be recommended based on the discoveries got, they may not be precise. Therefore, this analysis emphatically prescribes future analyst to utilize a longitudinal methodology in exploring the impact of TQM on SMEs' performance. Additionally, to accomplish the exploration focuses on a quantitative technique was utilized; in any case, utilizing divergent methods, for example, interviews with SMEs owners-managers would help their comprehension of how to execute TQM effectively or clarify why some SMEs have not yet taken up TQM.

Additional drawback of the present analysis is the lack of sum up the outcomes to various settings and societies, as data were brought together just from southwestern Nigeria. The analysis was additionally kept to manufacturing companies so the outcomes can't be summed up to different sectors. Hence, the future investigation may think about the impact of TQM on financial and non-financial performance in other sectors. Lastly, for a more purpose analogous, future

investigations may be reached out to other West African countries and further to see how the model acts in comparative SMEs in these nations.

Intending studies ought to examine the intervening role of OC establish on the CVF measurements on the association between TQM and SMEs performance.

## Declarations

### Author contribution statement

A. A. Eniola: Conceived and designed the experiments; Performed the experiments; Analyzed and interpreted the data; Contributed reagents, materials, analysis tools or data; Wrote the paper.

G. K. Olorunleke, O. O. Akintimehin: Performed the experiments; Contributed reagents, materials, analysis tools or data; Wrote the paper.

J. D. Ojeka, B. Oyetunji: Contributed reagents, materials, analysis tools or data; Wrote the paper.

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The authors declare no conflict of interest.

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