

Developing rightly culture on TQM - evidence from SMEs in the context of emerging economy

Developing
rightly culture
on TQM

465

Abdullahi Hassan Gorondutse,^{a,*}, Gamal Abdualmajed Ali,^b and Haim Hilman^c

^a*Nigeria Police Academy Wudil, Department of Economics and Management Science, Kano, Nigeria*

^b*University of Hafr Albatin, College of Business Administrative, Kingdom of Saudi Arabia and Thamar University, Faculty of Administrative Sciences, Thamar, Yemen, and*

^c*Universiti Utara Malaysia, Institute for Business Competitiveness, Standards and Sustainability Initiative, School of Business Management, Sintok, Malaysia*

Received 15 November 2020
Revised 18 January 2021
1 April 2021
Accepted 30 May 2021

Abstract

Purpose – Total quality management (TQM) must include orientation towards quality awareness in the overall organisational processes in a firm. A successful TQM needs a supportive culture that can adapt to alterations and strengthen innovation. This study aims to confirm the association between the style of management known as organisational culture (OC) and TQM practices in manufacturing Small and Medium Enterprises (SMEs).

Design/methodology/approach – Data-driven research was drawn from self-assessment inquiries among 772 managers/owners of manufacturing SMEs of the Saudi Arabia Kingdom (KSA). The dominant culture was detected by means of a cross-sectional technique.

Findings – The findings enrich the literature by revealing a positive effect of OC on TQM execution in the manufacturing SMEs of KSA.

Research limitations/implications – Prior to the execution of TQM operations, administrators of manufacturing SMEs should be aware of the culture within organisations so that TQM may be implemented.

Practical implications – The study suggests that organisations, particularly manufacturing SMEs, should constantly strive to enhance the TQM culture.

Social implications – Amid intense competition among manufacturing SMEs, it is crucial to guarantee their high performance. This research assists society in evaluating the strength of a particular SME sector and further enables it to assess which SMEs really have a good OC–TQM relation.

Originality/value – The paper creates and presents various platforms of the OC and TQM as a unified body of knowledge.

Keywords Organisational culture, TQM, Manufacturing SMEs, KSA

Paper type Research paper



1. Introduction

Globally, firms face increasing pressure to apply innovative and low-cost techniques to improve products and processes to respond to customers' needs and desires (Patyal & Koilakuntla, 2018; Ebrahimi & Sadeghi, 2013). In addition, in the past few years, establishments of different types experienced radical alterations in their operating contexts brought about by different circumstances, such as ever-increasing consumer awareness of quality, rapid technological shift, global proliferation and cheaper rivalry (Patyal & Koilakuntla, 2018). Alkhoraif and Mclaughlin (2017) asserted that lower cost, better quality and timely delivery have emerged as more significant challenges for Saudi Arabia Kingdom (KSA) small-sized businesses. Simple inspection operations have been supplemented by quality control and quality assurance ethics. In this regard, several firms are being motivated to accept and put into place new operation management procedures, such as TQM and active quality enhancement programmes to subsist in this ever-changing business atmosphere (Valmohammadi & Roshanzamir, 2015; Psoomas & Antony, 2015). Firms have widely accepted TQM as a tool for achieving excellent performance (Patyal & Koilakuntla, 2018; Gambi, Boer, Gerolamo, Jørgensen, & Carpinetti, 2015). However, several studies have also reported a high rate of failures and problems in implementing TQM processes (Srinivasan & Kurey, 2014; Abdolshah & Abdolshah, 2011; Sila, 2007).

This view was supported by Valmohammadi and Roshanzamir (2015), as they indicated that a significant number of TQM have created serious problems or have failed entirely, enough to threaten an organisation's survival. This paper shows that organisational culture (OC) and total quality management (TQM) are conventionally connected (Atuahene & Baiden, 2017), so that, to improve the quality of the small and medium enterprises (SMEs), a comprehension of OC is essential (Patyal & Koilakuntla, 2018). Furthermore, numerous studies agree that an OC which does not support TQM is a crucial reason for the failure or a barrier to the implementation of TQM (Haffar, Al-Karaghoul, Djebarni, & Gbadamosi, 2017; Kaluarachchi, 2010). This means that cultural transformation is fundamental to bring about successful operations of TQM in SMEs (Rad, 2006). Hence, there is a need for a better understanding of the role that OC plays in the successful implementation of TQM, specifically in SMEs.

In the case of Saudi SMEs, the challenge is innovation on OC and the difficulty of accepting changes among employees in various organisations (Alkhoraif & Mclaughlin, 2017; Albliwi, Antony, Arshed, & Ghadge, 2017). The fact is that the SME sector occupies a very significant position in the expansion and growth of the economy in most emerging nations due to job creation, contribution to modernisation and technological development (OECD, 2017; Rodríguez-Gutiérrez, Moreno, & Tejada, 2015). In addition, they signify more than half of the added value and employment in both the advanced and developing nations (Rodríguez-Gutiérrez et al., 2015; Valmohammadi, 2011). Like other economies, in KSA, SMEs account for almost 90% of all business initiatives, are responsible for 25% of total employment and contribute up to 20% of gross domestic product (Kingdom of Saudi Arabia, 2016; Jeddah Chamber of Commerce & Industry, 2015).

Even with the extensive literature on the link concerning OC and TQM in developing countries, the empirical research investigating the effect of OC on TQM implementation in developing and Arab countries, specifically in KSA SMEs, is relatively rare (Patyal & Koilakuntla, 2018; Ali, Abdullah, & Gorondutse, 2017). More importantly, there is a lack of studies examining the mechanics of this nexus between OC and TQM. It is indispensable for SMEs to embark on productivity and quality initiatives to be more competitive in the international market. There is an absence of organised data-driven evidence regarding the effects of OC concerning TQM application within KSA SMEs. This research aims to understand the effect of OC on successful TQM implementation, particularly in manufacturing SMEs, thus adding value to the rare body of literature about Arab countries.

This research is planned as follows: Section 2 shows the literature examination and establishes the study's hypotheses. Section 3 brings the methodology, results and analysis. Results derived from this study are discussed in the middle of Section 4. In the end, the conclusions, limitations and propositions for upcoming research studies are presented in Section 5.

2. Literature review and hypotheses

2.1 Organisational culture

In literature, OC has been mentioned as the collective definitions or assumptions, beliefs and comprehensions which are effortlessly noticeable (Cameron & Quinn, 2006). *Culture* addresses people matters, and thus becomes the crucial factor in effective TQM implementation (Valmohammadi & Roshanzamir, 2015). In the organisation theory, OC has become a very important subject (Sinha & Dhall, 2018). OC encompasses the group's values, beliefs, assumptions and norms that describe an organisation and are shared by an organisation's members (Cameron & Quinn, 2006; Schein, 1984). OC serves as a tool used by managers to shape the direction of their organisations and provides individuals with norms for behaviour in the firm (Daft & Lane, 2005; Smircich, 1983). As such, OC affects people's behaviours and decisions, the organisation's style of work, and then enhance firm performance (Wu, Zhang, & Schroeder, 2011). OC also assists organisations in adapting both internally and externally to motivate employees, improve productivity and develop a higher impact on all functions of organisations (Deal & Kennedy, 1982). Thus, managers should build and develop OC to direct the employees' efforts to realise the organisation's aims (Morgan, Rapp, Richey, & Ellinger, 2014; Asree, Zain, & Rizal Razalli, 2010). This means that ignoring the effect of OC is one of the most severe obstacles to change, as it impacts the new initiatives that are to be implemented (Cameron & Quinn, 2006).

This paper uses the Competing Values Framework (CVF) introduced by Cameron and Quinn (2006). CVF has been developed in four *proportions*, namely, clan, adhocracy, market and hierarchy culture. This model denotes whether an entity has a major inside or outside concentration and endeavours for elasticity and individuality or stability and control. The CVF has been accepted by numerous researchers to investigate the influence of OC on different cases, such as TQM practices (Haffar, Al-Karaghoul, & Ghoneim, 2013; Sinha, Garg, Dhingra, & Dhall, 2016). Furthermore, the urgencies for performance by these cultures are the construction of human strength and possibilities, attainment of new market and properties for advancement, efficiency and proficiency and control and constancy (Hilman, Ali, & Gorondutse, 2019), correspondingly. In this case, each association reveals a mixture of diverse cultural types, although one does have the potential to supersede the other (Cameron & Quinn, 2006; Ali, Abdullah, & Gorondutse, 2019).

2.2 Total quality management

Literature reveals that numerous organisations globally have profited from the application of TQM (Kuo & Kuo, 2010). In operation management literature, the initially combined theoretical and data-driven outline of TQM as a tactical asset was provided by Powell in 1995 (Sinha & Dhall, 2018). Before that, TQM depended on case studies, concepts, practices of the recognised quality experts like Deming, Juran, Crosby, Feigenbaum and Ishikawa (Black & Porter, 1996). TQM was widely accepted as the primary key to business excellence for several organisations around the world later on (Gambi *et al.*, 2015; Kuo & Kuo, 2010; Schein, 1984). TQM can be described as:

[...]an all-inclusive organisational thinking that endeavours for constant upgrading in all purposes of an establishment, and can be realized only if the total quality idea is used from the attainment of assets to customer service after the sale (Ali *et al.*, 2020).

Similarly, according to Powell (1995), TQM is organisational thinking that supports organisations to achieve a wide range of benefits, such as greater employee commitment and motivation, better inside communication, improved solution-providing, comprehension of consumer's needs, improved fulfilment of customer, more solid dealings with contractors, waste reduction and fewer errors. This definition is in line with Wang, Chen, and Chen (2012), who defined TQM as an organisational technique that emphasises unceasing upgrading inside firms to achieve the needs of consumers and provide greater purchaser worth. Accordingly, process management of practice can support continuous improvement in the QM principle, which includes many tools, such as Pareto analysis and statistical process control (Sousa & Voss, 2002). Previous studies have also widely recognised that OC occupies a major position in the success of TQM implementation (Sinha & Dhall, 2018; Haffar *et al.*, 2017; Hilman *et al.*, 2019). TQM work recognises an all-inclusive list of quality management norms, specifically, top management leadership, process management, human resource management, quality information and communication and customer and supplier relationship management (Haffar *et al.*, 2017; Talib, Ali, & Idris, 2014). The operative application of TQM in the building sector can be achieved by combining these quality management activities. Consequently, in this research, six frequently used practices of applying TQM are considered.

Various scholars have endeavoured to identify TQM practices (Talib *et al.*, 2014; Sadikoglu & Zehir, 2010; Sila & Ebrahimpour, 2002; Black & Porter, 1996; Ali *et al.*, 2019). In this regard, all TQM practices are currently in the frameworks applied in the national quality awards, such as European Foundation for Quality Management, Malcolm Baldrige National Quality Award (MBNQA), Deming Prize and also in ISO-9000 quality certification (Amin, Aldakhil, Wu, Rezaei, & Cobanoglu, 2017; Ali *et al.*, 2019). The present study used the MBNQA model performance excellence conditions to recognise six TQM practices to examine the implementation of TQM in KSA SMEs' context. More importantly, authors in operations management have linked cultural beliefs and values and perform of operations management, such as TQM and manufacturing strategy (Flynn & Saladin, 2006; Bates, Amundson, Schroeder, & Morris, 1995). Many studies confirm the vital role of OC; hence, additional investigation of the link concerning OC and TQM in developing countries is required.

2.3 Relationship between organisational culture and total quality management

Culture occupies an important position in the positive application of quality management plans within an organisation. As OC produces an organisational climate, it impacts quality management practices to back excellence enhancement proposals (Haffar *et al.*, 2013; Prajogo & McDermott, 2005). The existing literature reveals several novel problems linking to the process of TQM implementation and how they impact its results (Valmohammadi & Roshanzamir, 2015). OC is considered an essential factor for the successful implementation of TQM; in fact, is among the factors listed at the top (Baird, Jia Hu, & Reeve, 2011; Prajogo & McDermott, 2005). That means unsupportive OC is a major barrier to the failures in the practicability of TQM (Haffar *et al.*, 2013; Rad, 2006). Within a firm, making a critical culture change to correspond to TQM is a key requirement for the positive application of TQM (Rad, 2006). As reported by Quinn and Cameron (1999), TQM ideas did not work in organisations as a result of two major reasons: partial publishing of TQM activities and failure to incorporate TQM and culture change. In this regard, within the range of 20% to 35% of the

organisations that have implemented TQM achieved competitiveness because of a lack of comprehending the fitness of OC (Rad, 2006).

In the TQM domain, literature indicates that a positive link exists between OC and TQM (Valmohammadi & Roshanzamir, 2015; Hilman *et al.*, 2019; Ali *et al.*, 2019). However, Panuwatwanich and Nguyen (2017) found that both market and hierarchy cultures could not offer a likeable atmosphere for positive TQM application. Furthermore, Gimenez-Espin, Jiménez-Jiménez, and Martínez-Costa (2013) revealed that activities related to clusters, growth and diverse cultures have a significant impact on TQM applications, while pecking order and coherent cultures give contrary results. Conversely, research by Zu, Robbins, and Fredendall (2010) encouraged that cluster and coherent cultures had a positive impact on TQM activities, while development and hierarchical cultures were revealed not to have associations with TQM practices (Hilman *et al.*, 2019; Soares & Perin, 2019; Ali *et al.*, 2019). On the other hand, the same does not happen with those subsumed by both clan and adhocracy cultures. This research determines the strength of OC as a driver of “fertile soil” and its influence on TQM. That means it is important to balance and incorporate all types of culture, and that no cultural types are more significant than the others (Giritli, Öney-Yazıcı, Topçu-Oraz, & Acar, 2013; Denison & Spreitzer, 1991). Therefore, the following study hypothesis is posited:

H1. OC positively influences TQM in manufacturing SMEs.

3. Material methods

3.1 Research design

This paper used a quantitative approach to estimate the relationship between OC (market, adhocracy, clan and hierarchy) and TQM (customer focus, leadership, human resource management, strategic planning, process management and information analysis), as Figure 1 shows:

3.2 Population and sample

Data collection was carried out using self-administered questionnaires to manufacturing SMEs managers/providers in Riyadh, Mecca and Eastern KSA. The population during the research was 5,820 (Ministry of Commerce & Investment, 2016) and Krejcie and Morgan (1970) guide to achieving the sample size in this context was 361. We used a cross-sectional design technique for the survey. Data collection was performed at a specific point in time (six months in 2017) and the calculated sample size was doubled to reduce errors and non-response problems (Hair, Celsi, Ortinau, & Bush, 2008). Therefore, 722 was the total number of questionnaires administered.

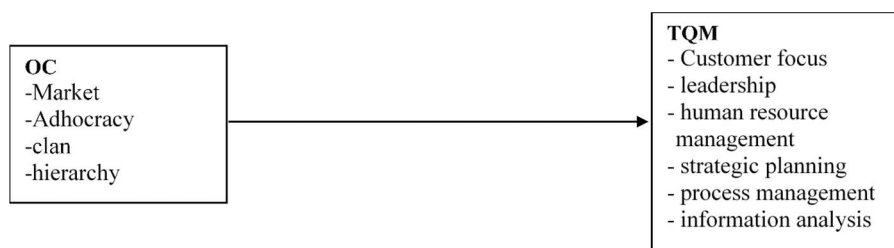


Figure 1.
 Research framework

3.3 Common method bias and non-response bias

As self-reported questionnaires were used to collect data, they were tested for common method bias-variance, particularly necessary when both the predictor and criterion variables are obtained from the same person (Podsakoff, MacKenzie, Lee, & Podsakoff, 2003). In this case, Podsakoff and Todor (1985, p. 65) warned that: "Invariably, when self-reported measures obtained from the same sample are applied in research, concerns over same-source bias or general method variance arise". To tackle this issue, the paper used Harman 1-factor on the three constructs for detecting common method variance bias (CMV); the first factor only explained 40.95% of the variance, so CMV is not a relevant problem in this study. Furthermore, to estimate the existence of the non-response bias in the data, a *t*-test was used to test the statistical difference between the early and delayed responses. Test results showed that no significant values were higher than 0.05, which indicates that the variances were presumed to be approximately impartial. Consequently, no substantial dissimilarities exist between the two groups (early and late respondents) in terms of all the variables under investigation ($p < 0.05$). Moreover, the issue of non-response bias was absent, and the samples obtained represented the total population of the study (Pallant, 2010; Armstrong & Overton, 1977).

3.4 Measures

In this paper, the OC instrument was adapted from Cameron and Quinn (2006). It contains 24 items in a one-dimensional array, and numerous scholars have confirmed the apparatus alias instrument and have established its reliability and validity (Hilman *et al.*, 2019; Ali *et al.*, 2019; Haffar *et al.*, 2017; Hilman *et al.*, 2019; Ali *et al.*, 2019). The paper used a seven-point Likert-type scale starting from "strongly disagree (=1)" up to "strongly agree (=7)" to measure the instruments. The TQM actions come about by measurement using the six criteria of the MBNQA, which have earlier been widely used in numerous findings for TQM application of measuring (Hilman *et al.*, 2019; Ail *et al.*, 2019; Haffar *et al.*, 2017; Ali *et al.*, 2019; Lam, Lee, Ooi, & Lin, 2011; Prajogo & Hong, 2008). The study adapted measurement 36 items for TQM as a single entity from the research works done by Samson & Terziovski, 1999; Wang *et al.*, 2012; Prajogo & Sohal, 2006. These items have a good theoretical foundation and a strong indication of construct reliability and validity (Ail *et al.*, 2019; Haffar *et al.*, 2017; Ng, Zhao, Fan, & Rungtusanatham, 2014). To estimate the suggested model, the partial least square-structural equation model (PLS-SEM) was used to create the measurements' validity and reliability and examine the assumed hypothesis as described in the subsequent segments.

4. Data analysis

To test the PLS path models, this research used Chin's (1998) suggestions. The PLS model is tested and explained in two steps: firstly, the measurement model evaluation reliability and validity are tested prior to hypotheses testing (Hair, Black, Babin, Andersen, & Tatham, 2010). Secondly, the structural model (SM) evaluation (R^2 and predicative relevance of the model) was conducted after bootstrapping to confirm the research hypothesis.

4.1 Measurement model

The measurement model (MM) was evaluated through construct validity, content validity and discriminant validity as explained in the following sections.

4.2 Construct validity

Construct validity denotes how outcomes gained from appropriate theories measure the test calculated (Sekaran & Bougie, 2016). The MM content validity can be achieved by paying attention to items like factor loading (Hair *et al.*, 2013). Here, items should be larger than the hypothesized construct and other constructs (Chin, 2010). For that purpose, if items load is larger than their own construct, then the items will be removed (Hair *et al.*, 2013). The significant cut-off threshold for this study is 0.7 (Hair, Hult, Ringle, & Sarstedt, 2014). As illustrated in Table 1 below, all the items loaded are larger and more substantial on their hypothesized factor than on other factors, consequently confirming the content validity of the MM.

4.3 Convergent validity

In this section, convergent validity with multiple items that relate to the same idea are in consonance and referred to as CV (Ramayah, Lee, & In, 2011). Hair *et al.* (2010) reported that this can be established by testing the factor loadings, average variance extracted (AVE), composite reliability (CR) and approximate convergence validity. Thus, the factor loadings of all items surpassed the suggestion value of 0.7 (Hilman *et al.*, 2019; Hair *et al.*, 2014). Furthermore, all alpha coefficients, CR and AVEs are better than the cut-off values and characters 0.7 and 0.5 correspondingly (Hilman *et al.*, 2019; Hair *et al.*, 2014) as shown in Table 1. Thus, all constructs are in line with the threshold value and were reflected to have met the average endorsed for convergent validity.

4.4 Discriminant validity

Discriminant validity is evaluated by calculating the square root of the AVE as recommended by Hair *et al.* (2014) and Fornell and Larcker (1981). Based on the latter, the square root of the AVE is personified on the diagonal line in the construct correlation matrix and should be greater than the off-diagonal elements in the corresponding rows and columns (Ali *et al.*, 2019). In the results shown in Table 2, all the square roots of the AVE characters surpassed within its own rows and columns, suggesting the discriminant validity can be thus confirmed in the current study.

4.5 Structural model evaluation

After confirming the validity and reliability of the MM, our study followed by analysing the hypothesized association via the PLS algorithms and bootstrapping in Smart PLS 3.2.7 (the results of this analysis can be seen in Figure 2 and Table 3). As suggested by Hair *et al.* (2014), the average for the estimation of the SM is the R^2 , as the objective of the prediction-oriented PLS-SEM method is to illustrate the dependent latent variables' discrepancy, thus R^2 as one of the essential purpose variables has to be substantial. In line with Hair *et al.* (2017); Hilman *et al.* (2019), in management research, the R^2 value can be thus categorised: 0.75, 0.50, 0.25 as *substantial*, *moderate* and *weak*, respectively. Based on this research, after PLS algorithm analysis R^2 was revealed to be 0.473, signifying that OC accounted for 47.3% of the variance in TQM, which is between *weak* and *moderate*.

For assessing the model, the blindfolding method was used (Henseler, Ringle, & Sinkovics, 2009). When the blindfolding approach is used to obtain the Q2, the cases amount in the raw fact must not be a multiple numbers of the oversight coldness d or else the blindfolding method would be incorrect, and a number from 5 to 10 should be selected (Hair *et al.*, 2014). Therefore, we chose 9 as the number of the d to govern the cross-validated redundancy actions for every endogenous factor. Following the recommendations by

Constructs	Items	Factor loadings	Cronbach's alpha	Composite reliability (CR)	Average variance extracted (AVE)	
OC (organisational culture)	Clc1	0.852	0.921	0.939	0.719	
	Clc2	0.881				
	Clc3	0.865				
	Clc4	0.879				
	Clc5	0.829				
	Clc6	0.778				
	Adc7	Adc7	0.802	0.920	0.938	0.715
		Adc8	0.862			
		Adc9	0.886			
		Adc10	0.882			
		Adc11	0.834			
		Adc12	0.804			
	Mac13	Mac13	0.768	0.897	0.921	0.662
		Mac14	0.828			
		Mac15	0.846			
		Mac16	0.852			
		Mac17	0.847			
		Mac18	0.736			
	Hic19	Hic19	0.781	0.907	0.928	0.683
		Hic20	0.827			
		Hic21	0.860			
		Hic22	0.858			
		Hic23	0.839			
Hic14		0.791				
TQM (total quality management)	Lep1	0.888	0.949	0.959	0.798	
	Lep2	0.912				
	Lep3	0.918				
	Lep4	0.902				
	Lep5	0.883				
	Lep6	0.856				
	Cuf7	Cuf7	0.824	0.938	0.951	0.764
		Cuf8	0.889			
		Cuf9	0.895			
		Cuf10	0.905			
		Cuf11	0.883			
		Cuf12	0.847			
	Stp13	Stp13	0.828	0.918	0.937	0.713
		Stp14	0.864			
		Stp15	0.898			
		Stp16	0.890			
		Stp17	0.844			
		Stp18	0.732			
	Hrs19	Hrs19	0.816	0.920	0.938	0.715
		Hrs20	0.846			
		Hrs21	0.873			
		Hrs22	0.880			
		Hrs23	0.873			
		Hrs24	0.781			
	Ina25	Ina25	0.819	0.938	0.950	0.730
		Ina26	0.861			

Table 1.
Convergent validity

(continued)

Table 1.

Constructs	Items	Factor loadings	Cronbach's alpha	Composite reliability (CR)	Average variance extracted (AVE)
	Ina27	0.856			
	Ina28	0.877			
	Ina29	0.872			
	Ina30	0.861			
	Ina31	0.835			
	Prm32	0.842	0.921	0.941	0.761
	Prm33	0.894			
	Prm34	0.900			
	Prm35	0.893			
	Prm36	0.832			

Notes: Lep = leadership; Cuf = customer focus; Stp = strategic planning; Hrs = human rescuer management; Inf = information and analysis; Prm= process management; Clc= clan culture; Adc = adhocracy culture; Mac = market culture; Hic = hierarchy culture

Table 2.

Constructs	Adc	Clc	Cuf	Hic	Hrs	Ina	Lep	Mac	Prm	Stp	
Adc	0.846										
Clc	0.541	0.848									
Cuf	0.424	0.433	0.874								
Hic	0.528	0.455	0.485	0.827							
Hrs	0.452	0.388	0.605	0.464	0.846						
Ina	0.442	0.442	0.641	0.536	0.597	0.854					
Lep	0.466	0.425	0.674	0.496	0.596	0.592	0.893				
Mac	0.522	0.420	0.428	0.581	0.391	0.399	0.384	0.814			
Prm	0.488	0.409	0.556	0.499	0.540	0.612	0.604	0.406	0.872		
Stp	0.492	0.489	0.658	0.502	0.666	0.636	0.588	0.425	0.575	0.844	Discriminant validity

Hilman *et al.* (2019) and Hair *et al.* (2017), the result of this research reports a predictive quality if the cross-redundancy value is more than zero; if not, the predictive relevance of the model may not be concluded. As presented in Table 3, the results showed that the cross-validated redundancy for TQM was found to be 0.223.

The final step in the SM enquiry also involves evaluating the path coefficients that explain the powers of the connection between the independent variable (IV) and dependent variable (DV). The final step in the SM assessment also involves evaluating the path coefficients, which simplify the power of the connection in respect to the IV and DV. Based on the suggestion by Hilman *et al.* (2019) and Hair *et al.* (2014), this research used 5,000 samples. Table 4 includes the path coefficients and bootstrapping results.

5. Discussion

OC is among the most important intangible resources that can assist an organisation to bring about the competitive edge, thus differentiating the firm from its competitors (Barney, 1986). This is a critical factor for the organisation, helping with the implementation of business stratagems. TQM is a management philosophy covering all the business operations and pursues advancing

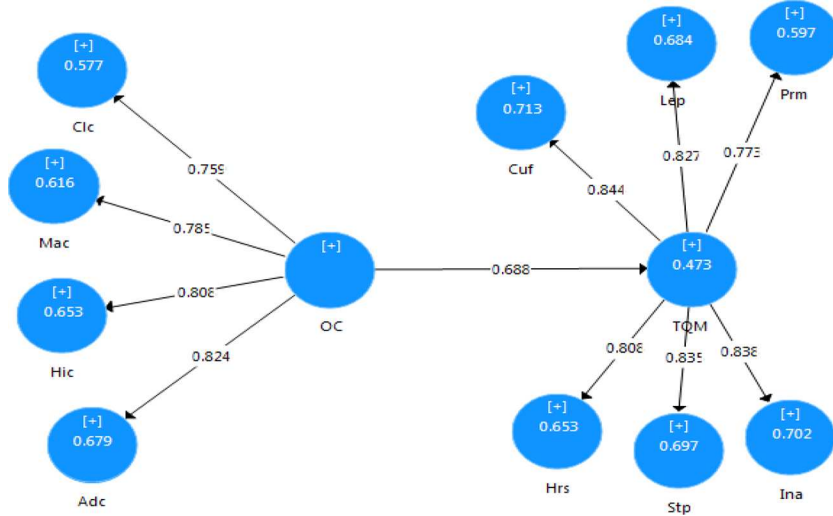


Figure 2.
Results for the
proposal model

Table 3.
Predictive relevance
of the model

Total	SSO	SSE	1 – SSE/SSO
TQM	13,104	10,184.4	0.223

Table 4.
Hypothesis test
results

Hypotheses	Path coefficient	Standard error	t. statistic	p. value	Results
OC -> TQM	0.688	0.045	15.172	0.000	Supported

quality in all organisational procedures (Gimenez-Espin *et al.*, 2013). That means OC can facilitate the successful implementation of TQM (Hilman *et al.*, 2019; Sinha & Dhall, 2018; Ali *et al.*, 2017; Haffar *et al.*, 2017). Founded on the conceptual model verified and reinforced in this research, we contend that OC may improve and provide the appropriate environment to implement TQM in any firm, improving performance. To the authors' knowledge, this study represents the first data-driven research to examine the effect of OC on TQM in the context of Saudi SMEs manufacturing.

The statistical results indicated that the assumed study hypothesis was supported and sustained. In particular, a significant and positive association between OC and TQM was confirmed at the 0.001 level of significance ($b = 0.688$, $t = 15.172$), see Table 4. This research result is consistent with the findings of preceding studies obtained by Ali *et al.* (2019), Sinha and Dhall (2018), Valmohammadi and Roshanzamir (2015), Gimenez-Espin *et al.* (2013), Haffar *et al.* (2013) and Baird *et al.* (2011). A preponderance of empirical studies tends to concentrate on the relationship between OC and TQM in big organisations, especially in developed economies. This study produces an exclusive contribution to the existing literature by authenticating the impacts of OC on TQM in the framework of manufacturing

SMEs in a developing country, such as KSA, where SMEs function in comparatively more explosive atmospheres with high reservations.

Meanwhile, a firm should operate towards modifying current OC so that it can be more amenable to proactivity, risk forward-thinking and accept new strategies, such as TQM practices (Leavengood, Anderson, & Daim, 2014). Furthermore, to create a supportive OC that leads to continuous improvement where all employees can contribute and disseminate quality assurance in all organisational operations; which, in turn, will be conducive to the successful implementation of TQM (Hilman *et al.*, 2019; Ali *et al.*, 2019; Sinha & Dhall, 2018).

6. Theoretical implications

This research adds meaningful knowledge to the body of literature in several ways. Firstly, this study will become a body of reference for the manufacturing SMEs in an emerging country, such as KSA and government agencies for the promulgation of guidelines, promotion and application of suitable OC. Subsequently, the outcomes of this research may help improve the theory of OC and TQM implementation in the background of manufacturing SMEs. Finally, the results of the study are deemed to present a significant contribution to the TQM field.

6.1 Managerial implications

In the KSA, SMEs are facing competitive pressures in the local market to survive; they need to improve their product quality standards. This result supports the successful implementation of TQM. To accept the implementation of a change process like TQM in KSA manufacturing SMEs, owners/managers must understand the sequence of the influence of OC and make sure their workers accept the change process. In this case, administrators should avoid hierarchical or bureaucratic management because it does not lead to the successful execution of TQM. On the contrary, administrators of SMEs must concentrate on democratic management and flexible policies and regulations to encourage firm members to be innovative and creative to improve TQM, and thus increase the effectiveness of their organisation. More importantly, SMEs should create and develop a supportive OC as a fertile environment to prepare employees to accept change and then commit to TQM implementation. Therefore, the findings acquired from the current research would assist KSA manufacturing SMEs to align their TQM interventions with their respective OC adequately.

6.2 Limitations and future research

As in other data-driven studies, the present research has its limitations and the results here should be deliberated accordingly to give a chance for future studies. Firstly, this study used a survey design with cross-sectional data, where data were collected at one single point in time. Hence, data acquired only indicate the degree of linkage between variables; while the causal associations are inferred regarding the findings gained, it cannot be strictly ascertained. A comprehensive review revealed that changes in OC or implementation of TQM are long term processes, which is sometimes difficult and slow (Gimenez-Espin *et al.*, 2013). Therefore, to analyse changes in the OC of the organisation over time, to assist in successful TQM implementation, this research suggests that a longitudinal study should be considered. The second limitation is linked to the generalisability of the results in this research. Due to the fact that the current research was conducted in manufacturing SMEs, the results may not be generalisable to other industries. To raise the external validity of the results, future studies should consider other climes, specifically in-service companies and other developing countries, such as Kuwait, Bahrain, Egypt and Yemen for the sake of

comparison. Finally, the present research only investigated the associations between OC and TQM. Upcoming work of research should examine other constructs that may affect OC–TQM implementation relationships.

References

- Abdolshah, M., & Abdolshah, S. (2011). "Barriers to the successful implementation of TQM in Iranian manufacturing organisations". *International Journal of Productivity and Quality Management*, 7(3), 358–373. doi: <https://doi.org/10.1504/IJPQM.2011.039352>.
- Aichouni, M., Ait Messaoudene, N., Al-Ghonamy, A., & Touahmia, M. (2014). "An empirical study of quality management systems in the Saudi construction industry". *International Journal of Construction Management*, 14(3), 181–190. doi: <https://doi.org/10.1080/15623599.2014.922724>.
- Albliwi, S. A., Antony, J., Arshed, N., & Ghadge, A. (2017). "Implementation of lean six sigma in Saudi Arabian organisations: findings from a survey". *International Journal of Quality & Reliability Management*, 34(4), 508–529. doi: <https://doi.org/10.1108/IJQRM-09-2015-0138>.
- Ali, G. A., Abdullah, H. H., & Gorondutse, A. H. (2017). "The effect of entrepreneurial orientation, market orientation, total quality management and organisational culture on the SMEs performance: a theoretical framework". *Journal of Business and Retail Management Research (JBRMR)*, 12(1), 26–40.
- Ali, G. A., Hilman, H., & Gorondutse, A. H. (2019). "Total quality management, organisational culture and performance; study of SMEs in a developing economy". in Doney, J. (Ed.), *TQM Concepts, Implementation and Applications*, Nova Science Publishers, New York, USA, 25–63.
- Ali, G. A., Hilman, H., & Gorondutse, A. H. (2020). "Effect of entrepreneurial orientation, market orientation and total quality management on performance evidence from Saudi SMEs". *Benchmarking: An International Journal*, 27(4), 1503–1531.
- Alkhoraif, A., & Mclaughlin, P. (2017). "Organisational culture-enablers and inhibitors factors for the effective implementation of lean within SMEs". *International Journal of Lean Thinking*, 8(2), 65–96.
- Amin, M., Aldakhil, A. M., Wu, C., Rezaei, S., & Cobanoglu, C. (2017). "The structural relationship between TQM, employee satisfaction and hotel performance". *International Journal of Contemporary Hospitality Management*, 29(4), 1256–1278. doi: <https://doi.org/10.1108/IJCHM-11-2015-0659>.
- Anderson, M., & Sohal, A. S. (1999). "A study of the relationship between quality management practices and performance in small businesses". *International Journal of Quality & Reliability Management*, 16(9), 859–877. doi: <https://doi.org/10.1108/02656719910289168>.
- Armstrong, J. S., & Overton, T. S. (1977). "Estimating non-response bias in mail surveys". *Journal of Marketing Research*, 14(3), 396–402. doi: <https://doi.org/10.1177/002224377701400320>.
- Asree, S., Zain, M., & Rizal Razalli, M. (2010). "Influence of leadership competency and organisational culture on responsiveness and performance of firms". *International Journal of Contemporary Hospitality Management*, 22(4), 500–516. doi: <https://doi.org/10.1108/09596111011042712>.
- Atuahene, B. T., & Baiden, B. K. (2017). "Organisational culture of Ghanaian construction firms". *International Journal of Construction Management*, 18(2), 177–188. doi: <https://doi.org/10.1080/15623599.2017.1301043>.
- Baird, K., Jia Hu, K., & Reeve, R. (2011). "The relationships between organisational culture, total quality management practices and operational performance". *International Journal of Operations & Production Management*, 31(7), 789–814. doi: <https://doi.org/10.1108/01443571111144850>.
- Bates, K. A., Amundson, S. D., Schroeder, R. G., & Morris, W. T. (1995). "The crucial interrelationship between manufacturing strategy and organisational culture". *Management Science*, 41(10), 1565–1580. doi: <https://doi.org/10.1287/mnsc.41.10.1565>.

- Black, S. A., & Porter, L. J. (1996). "Identification of the critical factors of TQM". *Decision Sciences*, 27(1), 1–21. doi: <https://doi.org/10.1111/j.1540-5915.1996.tb00841.x>.
- Bou-Llusar, J. C., Escrig-Tena, A. B., Roca-Puig, V., & Beltrán-Martín, I. (2009). "An empirical assessment of the EFQM excellence model: Evaluation as a TQM framework relative to the MBNQA model". *Journal of Operations Management*, 27(1), 1–22. doi: <https://doi.org/10.1016/j.jom.2008.04.001>.
- Cameron, K. S., & Quinn, R. E. (2006). *Diagnosing and changing organisational culture: Based on the competing values framework*, USA: Jossey-Bass.
- Chin, W. W. (1998). "The partial least squares approach to structural equation modeling". in Marcoulides, G.A. (Ed.), *Modern Methods for Business Research*, Lawrence Erlbaum, Mahwah, 295–336.
- Chin, W. W. (2010). "How to write up and report PLS analyses". in Esposito, V.V., Chin, W.W., Henseler, J. and Wang, H. (Eds.), *Handbook of Partial Least Squares: Concepts, Methods and Applications In Marketing and Related Fields*, Springer, Berlin, 655–690.
- Daft, R. L., & Lane, P. G. (2005). *The leadership experience*, 3rd ed., Mason, OH: Thomson South-Western.
- Deal, T., & Kennedy, A. (1982). *A corporate culture*, Reading, MA: Addison-Wesley.
- Denison, D. R., & Spreitzer, G. M. (1991). "Organisational culture and organisational development: A competing values approach". *Research in Organisational Change and Development*, 5(1), 1–21.
- Ebrahimi, M., & Sadeghi, M. (2013). "Quality management and performance: An annotated review". *International Journal of Production Research*, 51(18), 5625–5643. doi: <https://doi.org/10.1080/00207543.2013.793426>.
- Flynn, B. B., & Saladin, B. (2006). "Relevance of baldrige constructs in an international context: A study of national culture". *Journal of Operations Management*, 24(5), 583–603. doi: <https://doi.org/10.1016/j.jom.2005.09.002>.
- Flynn, B. B., Sakakibara, S., & Schroeder, R. G. (1995). "Relationship between JIT and TQM: Practices and performance". *Academy of Management Journal*, 38(5), 1325–1360.
- Fornell, C., & Larcker, D. (1981). "Evaluating structural equation models with unobservable variables and measurement error". *Journal of Marketing Research*, XVIII, 39–50.
- Gambi, L. D. N., Boer, H., Gerolamo, M. C., Jørgensen, F., & Carpinetti, L. C. R. (2015). "The relationship between organisational culture and quality techniques, and its impact on operational performance". *International Journal of Operations & Production Management*, 35(10), 1460–1484. doi: <https://doi.org/10.1108/IJOPM-12-2013-0563>.
- Gimenez-Espin, J. A., Jiménez-Jiménez, D., & Martínez-Costa, M. (2013). "Organisational culture for total quality management". *Total Quality Management & Business Excellence*, 24(5-6), 678–692. doi: <https://doi.org/10.1080/14783363.2012.707409>.
- Giritli, H., Öney-Yazıcı, E., Topçu-Oraz, G., & Acar, E. (2013). "The interplay between leadership and organisational culture in the Turkish construction sector". *International Journal of Project Management*, 31(2), 228–238. doi: <https://doi.org/10.1016/j.ijproman.2012.06.010>.
- Haffar, M., Al-Karaghoul, W., & Ghoneim, A. (2013). "An analysis of the influence of organisational culture on TQM implementation in an era of global marketing: The case of Syrian manufacturing organisations". *International Journal of Productivity and Quality Management*, 11(1), 96–115. doi: <https://doi.org/10.1504/IJPQM.2013.050570>.
- Haffar, M., Al-Karaghoul, W., Djebarni, R., & Gbadamosi, G. (2017). "Organisational culture and TQM implementation: Investigating the mediating influences of multidimensional employee readiness for change". *Total Quality Management & Business Excellence*, 30(11-12), 1367–1388. doi: <https://doi.org/10.1080/14783363.2017.1369352>.
- Hair, J.F., Ringle, C.M., & Sarstedt, M. (2013). "Partial least squares structural equation modeling: rigorous, applications, better results and higher acceptance". *Long Range Plan*, 46(1-2), 1–12.

- Hair, J.F., Sarstedt, M., Ringle, C.M., & Gudergan, S.P. (2017). *Advanced Issues in Partial Least Squares Structural Equations Modeling (PLS-SEM)*, Sage, Thousand Oaks, CA.
- Hair, J. F., Celsi, M., Ortinau, D. J., & Bush, R. P. (2008). *Essentials of marketing research*, New York, NY: McGraw-Hill/Higher Education.
- Hair, J. F., Black, W. C., Babin, B. J., Andersen, R. E., & Tatham, R. L. (2010). *Multivariate data analysis*, 7th ed., Upper Saddle River, NJ: Pearson Prentice Hall.
- Hair, J. F., Hult, G. T. M., Ringle, C., & Sarstedt, M. (2014). *A primer on partial least squares structural equation modeling (PLS-SEM)*, Sage publications, Thousand Oaks.
- Henseler, J., Ringle, C. M., & Sinkovics, R. R. (2009). "The use of partial least squares path modeling in international marketing". In *New challenges to international marketing* (pp. 277–319). Emerald Publishing Limited, Emerald, Bingley.
- Hilman, H., Ali, G. A., & Gorondutse, A. H. (2019). "The relationship between TQM and SMEs' performance". *International Journal of Productivity and Performance Management*, 69(1), 61–84. doi: <https://doi.org/10.1108/IJPPM-02-2019-0059>.
- Jeddah Chamber of Commerce and Industry (2015). "Small medium enterprises in Saudi Arabia report". Retrieved from: <http://www.jcci.org.sa/English/Pages/default.aspx> (accessed 25 April 2016).
- Kaluarachchi, K. A. S. P. (2010). "Organisational culture and total quality management practices: A Sri Lankan case". *The TQM Journal*, 22(1), 41–55. doi: <https://doi.org/10.1108/17542731011009612>.
- Kaynak, H. (2003). "The relationship between total quality management practices and their effects on firm performance". *Journal of Operations Management*, 21(4), 405–435. doi: [https://doi.org/10.1016/S0272-6963\(03\)00004-4](https://doi.org/10.1016/S0272-6963(03)00004-4).
- Kingdom of Saudi Arabia (2016). "Vision 2030 report". Retrieved from: <http://vision2030.gov.sa/en/reports> (accessed 15 March 2017).
- Krejcie, R. V., & Morgan, D. W. (1970). "Determining sample size for research activities". *Educational and Psychological Measurement*, 30(3), 607–610. doi: <https://doi.org/10.1177/001316447003000308>.
- Kuo, T. H., & Kuo, Y. L. (2010). "The effect of corporate culture and total quality management on construction project performance in Taiwan". *Total Quality Management & Business Excellence*, 21(6), 617–632. doi: <https://doi.org/10.1080/14783363.2010.483074>.
- Lam, S. Y., Lee, V. H., Ooi, K. B., & Lin, B. (2011). "The relationship between TQM, learning orientation and market performance in service organisations: An empirical analysis". *Total Quality Management & Business Excellence*, 22(12), 1277–1297. doi: <https://doi.org/10.1080/14783363.2011.631337>.
- Leavengood, S., Anderson, T. R., & Daim, T. U. (2014). "Exploring linkage of quality management to innovation". *Total Quality Management & Business Excellence*, 25(9-10), 1126–1140. doi: <https://doi.org/10.1080/14783363.2012.738492>.
- Ministry of Commerce and Investment (2016). "Small and medium industries". Retrieved from: <https://mci.gov.sa/Pages/default.aspx> (accessed 15 January 2017).
- Morgan, T., Rapp, A., Glenn Richey, R., Jr. & Ellinger, A. (2014). "Marketing culture to service climate: The influence of employee control and flexibility". *Journal of Services Marketing*, 28(6), 498–508. doi: <https://doi.org/10.1108/JSM-08-2013-0226>.
- Ng, S. C., Zhao, X., Fan, X., & Rungtusanatham, J. M. (2014). "TQM and brand-building by Chinese original brand manufacturers: Impact on business performance". *International Journal of Production Research*, 52(3), 825–846. doi: <https://doi.org/10.1080/00207543.2013.842021>.
- OECD (2017). "Enhancing the contributions of SMEs in a global and digitalized economy". Retrieved from: www.oecd.org

-
- Pallant, J. (2010). *SPSS survival manual: a step by step guide to data analysis using SPSS*, 4th ed., New York, NY: Open University Press.
- Panuwatwanich, K., & Nguyen, T. T. (2017). "Influence of total quality management on performance of vietnamese construction firms". *Procedia Engineering*, 182, 548–555. doi: <https://doi.org/10.1016/j.proeng.2017.03.151>.
- Patyal, V. S., & Koilakuntla, M. (2018). "Impact of organisational culture on quality management practices: an empirical investigation". *Benchmarking: An International Journal*, 25(5), 1406–1428. doi: <https://doi.org/10.1108/BIJ-12-2016-0191>.
- Podsakoff, P.M., & Todor, W.D. (1985). "Relationships between leader reward and punishment behavior and group processes and productivity". *Journal of Management*, 11(1), 55–73.
- Podsakoff, P. M., & Organ, D. W. (1986). "Self-reports in organisational research: Problems and prospects". *Journal of Management*, 12(4), 531–544. doi: <https://doi.org/10.1177/014920638601200408>.
- Podsakoff, P. M., MacKenzie, S. B., Lee, J. Y., & Podsakoff, N. P. (2003). "Common method biases in behavioral research: A critical review of the literature and recommended remedies". *Journal of Applied Psychology*, 88(5), 879. doi: <https://doi.org/10.1037/0021-9010.88.5.879>.
- Powell, T. C. (1995). "Total quality management as competitive advantage: A review and empirical study". *Strategic Management Journal*, 16(1), 15–37. doi: <https://doi.org/10.1002/smj.4250160105>.
- Prajogo, D. I., & Hong, S. W. (2008). "The effect of TQM on performance in R&D environments: a perspective from South Korean firms". *Technovation*, 28(12), 855–863. doi: <https://doi.org/10.1016/j.technovation.2008.06.001>.
- Prajogo, D. I., & McDermott, C. M. (2005). "The relationship between total quality management practices and organisational culture". *International Journal of Operations & Production Management*, 25(11), 1101–1122. doi: <https://doi.org/10.1108/01443570510626916>.
- Prajogo, D. I., & Sohal, A. S. (2006). "The relationship between organisation strategy, total quality management (TQM), and organisation performance – the mediating role of TQM". *European Journal of Operational Research*, 168(1), 35–50. doi: <https://doi.org/10.1016/j.ejor.2004.03.033>.
- Psomas, E., & Antony, J. (2015). "The effectiveness of the ISO 9001 quality management system and its influential critical factors in Greek manufacturing companies". *International Journal of Production Research*, 53(7), 2089–2099. doi: <https://doi.org/10.1080/00207543.2014.965353>.
- Quinn, R., & Cameron, K. (1999). *Diagnosing and changing organisational culture*, Reading: Addison-Wesley.
- Rad, M. M. (2006). "The impact of organisational culture on the successful implementation of total quality management". *The TQM Magazine*, 18(6), 606–625.
- Ramayah, T., Lee, J. W. C., & In, J. B. C. (2011). "Network collaboration and performance in the tourism sector". *Service Business*, 5(4), 411. doi: <https://doi.org/10.1007/s11628-011-0120-z>.
- Rodríguez-Gutiérrez, M. J., Moreno, P., & Tejada, P. (2015). "Entrepreneurial orientation and performance of SMEs in the services industry". *Journal of Organizational Change Management*, 28(2), 194–212. doi: <https://doi.org/10.1108/JOCM-01-2015-0020>.
- Sadikoglu, E., & Zehir, C. (2010). "Investigating the effects of innovation and employee performance on the relationship between total quality management practices and firm performance: An empirical study of Turkish firms". *International Journal of Production Economics*, 127(1), 13–26. doi: <https://doi.org/10.1016/j.ijpe.2010.02.013>.
- Samson, D., & Terziovski, M. (1999). "The relationship between total quality management practices and operational performance". *Journal of Operations Management*, 17(4), 393–409. doi: [https://doi.org/10.1016/S0272-6963\(98\)00046-1](https://doi.org/10.1016/S0272-6963(98)00046-1).

- Schein, E. H. (1984). "Coming to a new awareness of organisational culture". *Sloan Management Review*, 25(2), 3–16.
- Sekaran, U., & Bougie, R. (2016). *Research methods for business: a skill building approach*, John Wiley & Sons.
- Sila, I. (2007). "Examining the effects of contextual factors on TQM and performance through the lens of organisational theories: an empirical study". *Journal of Operations Management*, 25(1), 83–109. doi: <https://doi.org/10.1016/j.jom.2006.02.003>.
- Sila, I., & Ebrahimpour, M. (2002). "An investigation of the total quality management survey based research published between 1989 and 2000: A literature review". *International Journal of Quality & Reliability Management*, 19(7), 902–970. doi: <https://doi.org/10.1108/02656710210434801>.
- Sinha, N., & Dhall, N. (2018). "Mediating effect of TQM on relationship between organisational culture and performance: Evidence from Indian SMEs". *Total Quality Management & Business Excellence*, 1–25.
- Smircich, L. (1983). "Concepts of culture and organisational analysis". *Administrative Science Quarterly*, 28(3), 339–358. doi: <https://doi.org/10.2307/2392246>.
- Soares, MdC., & Perin, M. G. (2019). "Entrepreneurial orientation and firm performance: an updated meta-analysis". *RAUSP Management Journal*, 55(2), 143–159. doi: <https://doi.org/10.1108/RAUSP-01-2019-0014>.
- Sousa, R., & Voss, C.V. (2002). "Quality management re-visited: a reflective review and agenda for future research". *Journal of Operations Management*, 20(1), 91–109. doi: [https://doi.org/10.1016/S0272-6963\(01\)00088-2](https://doi.org/10.1016/S0272-6963(01)00088-2).
- Sinha, N., Garg, A. K., Dhingra, S., & Dhall, N. (2016). "Mapping the linkage between organisational culture and TQM: The case of Indian auto component industry". *Benchmarking: An International Journal*, 23(1), 208–235. doi: <https://doi.org/10.1108/BIJ-12-2014-0112>.
- Srinivasan, A., & Kurey, B. (2014). "Creating a culture of quality". *Harvard Business Review*, 92(4), 23–25. [24830280](https://doi.org/10.24830280).
- Talib, H. A., Ali, A. M., & Idris, F. (2014). "Critical success factors of quality management practices among SMEs in the food processing industry in Malaysia". *Journal of Small Business and Enterprise Development*, 21(1), 152–176. doi: <https://doi.org/10.1108/JSBED-10-2013-0162>.
- Valerie, F. (2012). "Re-discovering the PLS approach in management science". *Management*, 15(1), 101–123.
- Valmohammadi, C. (2011). "The impact of TQM implementation on the organisational performance of Iranian manufacturing SMEs". *The TQM Journal*, 23(5), 496–509. doi: <https://doi.org/10.1108/17542731111157608>.
- Valmohammadi, C., & Roshanzamir, S. (2015). "The guidelines of improvement: Relations among organisational culture, TQM and performance". *International Journal of Production Economics*, 164, 167–178. doi: <https://doi.org/10.1016/j.ijpe.2014.12.028>.
- Wang, C. H., Chen, K. Y., & Chen, S. C. (2012). "Total quality management, market orientation and hotel performance: The moderating effects of external environmental factors". *International Journal of Hospitality Management*, 31(1), 119–129. doi: <https://doi.org/10.1016/j.ijhm.2011.03.013>.
- Wu, J. S., Zhang, D., & Schroeder, R. G. (2011). "Customization of quality practices: The impact of quality culture". *International Journal of Quality & Reliability Management*, 28(3), 263–279.
- Zu, X., Robbins, T. L., & Fredendall, L. D. (2010). "Mapping the critical links between organisational culture and TQM/six sigma practices". *International Journal of Production Economics*, 123(1), 86–106. doi: <https://doi.org/10.1016/j.ijpe.2009.07.009>.

Author contributions are as follows:

Gorondutse, Abdullahi Hassan – Conceptualization (Supporting). Data curation (Supporting). Formal analysis (Lead). Funding acquisition (Equal). Investigation (Supporting). Methodology (Lead). Project administration (Equal). Resources (Equal). Software (Lead). Supervision (Supporting). Validation (Supporting). Visualization (Lead). Writing-original draft (Supporting). Writing-review & editing (Lead). Hilman, Haim – Conceptualization (Supporting). Data curation (Equal). Formal analysis (Equal). Funding acquisition (Equal). Investigation (Lead). Methodology (Supporting). Project administration (Supporting). Resources (Equal). Software (Supporting). Supervision (Lead). Validation (Lead). Visualization (Equal). Writing-original draft (Supporting). Writing-review and editing (Equal). Ali, Gamal Abdualmajed – Conceptualization (Lead). Data curation (Lead). Formal analysis (Supporting). Funding acquisition (Equal). Investigation (Lead). Methodology (Supporting). Project administration (Equal). Resources (Equal). Software (Supporting). Supervision (Supporting). Validation (Equal). Visualization (Equal). Writing-original draft (Lead). Writing-review and editing (Equal).

***Corresponding author**

Abdullahi Hassan Gorondutse can be contacted at: ahgdutse@gmail.com

Associate editor: Manoel Portugal Ferreira

For instructions on how to order reprints of this article, please visit our website:

www.emeraldgrouppublishing.com/licensing/reprints.htm

Or contact us for further details: permissions@emeraldinsight.com