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QUALITY PAPER

TQM, strategy, and performance: a firm-level analysis

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Abstract

Purpose – The purpose is to examine the role of TQM in a strategy-TQM-performance model. More specifically, it seeks to investigate whether TQM has a driving role in the formation of strategy or has a mediating effect in the strategy-performance relationship.

Design/methodology/approach – A survey was used to collect data. The instrument was assessed for its validity and reliability. Structural equation modelling was employed.

Findings – TQM influences strategy formulation process and it is a dynamic resource that contributes to the achievement of a sustainable competitive advantage. In addition, soft TQM has a higher impact than hard TQM on competitive strategy formulation and on performance.

Research limitations/implications – The model developed and tested can be enriching to the TQM, strategic management, and quality management fields. Future research is recommended to use methods other than self-report questionnaires and to account for certain behavioral factors that can influence the relationships investigated in the study.

Practical implications – The findings provide insights to the need to integrate TQM with the various stages of the strategy formulation process, with an emphasis on the soft elements of TQM, including customer satisfaction, management and leadership, and employee relations.

Originality/value – Despite the remarkable contributions of existent research, there is a lack of substantive research that examines the relationship between the hard and soft components of TQM on one hand and the two types of competitive strategy – differentiation and cost leadership – on the other. This gap is filled by this study.

Keywords Competitive strategy, Hard TQM, Soft TQM, Performance, Resource based view, Contingency theory, Total quality management

Paper type Research paper

1. Introduction

As we are embarking on an era based on globalization and digitization, the concern for achieving high organizational performance amidst existing and emerging challenges is also increasing. There have been various studies on the relationship between total quality management (TQM) and organizational performance, with most pointing to positive relationships (Forker *et al.*, 1997; Brah *et al.*, 2002; Joiner, 2007) though some finding negative relationships (Yeung and Chan, 1998). In the fields of operations management and strategic management, the need to consider the relationship between strategy and TQM – while examining the impact of each on organizational performance – is well established (Schonberger, 1992; Prajogo and Sohal, 2006; Leonard and McAdam, 2001, 2004; Salaheldin, 2009; Jung *et al.*, 2009).

Research streams have examined the role of TQM and found support for the proposition that TQM could be viewed as a strategic resource that generates economic value and provides the firm with sustainable competitive advantage (Powell, 1995). This is achieved more through its tacit and imperfectly imitable features than with its process improvement and measurement methods. TQM has also been studied in terms of its relationship with strategy. Prajogo and Sohal (2006) have examined the fit of TQM practices in mediating the relationship between organization strategy and organization performance.

The literature suggests differentiation and cost leadership as two types of competitive business strategy (Porter and Millar, 1985). There are conflicting arguments concerning the strategic orientation that drives quality performance; one group of scholars argue that quality fits the differentiation strategy, whilst another group hold that quality is positively related to cost reduction, and thus supports the cost-leadership strategy (Prajogo, 2007). It has been argued that TQM can be usefully viewed as two components; hard (representing its tools, instruments, and techniques) and soft (leadership and HR management) (Boyne and Walker, 2002; Rahman and Bullock, 2005).

Studies examining the relationship among TQM, strategy, and performance typically depicted TQM as a mediator in the strategy – performance relationship (Ho *et al.*, 2001; Prajogo and Sohal, 2006). An alternative view of this relationship is one of strategy having a mediating role between TQM and performance. Previous studies in management, human resource management, and entrepreneurship examined the mediating role of strategy in organizational contexts. Edelman *et al.* (2001) examined the mediating role of strategy and its impact on small firm performance. Their findings indicated that well-articulated strategies serve as the catalyst with which firm resources influence performance (Edelman *et al.*, 2001). Other studies also investigated the mediating role of strategy in the relationship between human resource management and operational performance (Bayo-Moriones and Merino-Diaz de Cerio, 2002); in the effect of environment on organizational performance (Schul *et al.*, 1995); and in the relationship between top management entrepreneurial development and firm performance (Wood and Michalisin, 2010). In the field of quality management, there has been a lack of studies that examined TQM as a driver of strategic choices. An exception is a recent study conducted by Escrig-Tena *et al.* (2011), who found that TQM is an antecedent of strategic flexibility. We propose to examine these alternate views of the relationship by examining the relationship between the hard and soft components of TQM on one hand and the two types of competitive strategy – differentiation and cost leadership – on the other. With this goal, this paper will address the following questions:

- Does TQM mediate the strategy-performance relationship or does strategy mediate the TQM-performance relationship?
- Do these relationships vary between hard TQM and soft TQM?
- What is the relative impact of soft TQM and hard TQM on operational performance?

Our research explores these research questions by drawing on the resource-based view (RBV) of the firm, strategic choice, TQM dimensions, and contingency theory literatures for insights into the constructs and the relationships amongst them as stated in the research questions. Addressing the first research question will provide insights into whether TQM can be considered a driver of strategic choice. Examining the two roles that

TQM may have in an organization is similar to Spencer's (1994) approach followed by Prajogo and Sohal (2004). The authors examined TQM within a mechanistic model (emphasizing quality by conformance) as well as within an organic model (supporting innovation). The authors argued that organizations implementing TQM may not strictly hold to any specific one of these configurations. The same argument holds for our approach. One may expect different TQM roles for the choice and deployment of different competitive strategies and for the pursuit of different organizational performance objectives. As for the second and third research questions, they take into consideration the multidimensionality of the TQM concept, which is viewed as embracing both social and technical dimensions (Bou-Llusar *et al.*, 2009) or, more commonly used, soft and hard components (Prajogo and Sohal, 2004). Previous studies investigating the relationship between these two TQM dimensions and organizational performance reported mixed results (Rahman and Bullock, 2005). However, while some studies examined the relationship between TQM and strategy (Prajogo and Sohal, 2006), very few studies examined the relationship between TQM dimensions and competitive strategies (Jung *et al.*, 2009).

This research seeks to fill the two gaps mentioned above. First, based on RBV, it takes into consideration the TQM dimensions (soft and hard) and investigates their relationship with the two types of competitive strategies (differentiation and cost leadership) as well as their relationship with performance. It then explores, based on the contingency view, the mediating effect of strategy and TQM in the TQM-strategy-performance relationship. The remaining of the paper will proceed as follows. The following section presents the theoretical framework and the literature upon which the study is based. The logic embodied in these literatures will then be used to develop an integrative model of the relationships between TQM dimensions, strategy choice, and the operational performance of the firm, based on which testable hypotheses will be posited. Second, the methodology deployed to test the hypothesized relationships will be discussed. This will be followed by a presentation and discussion of results. Finally, the contribution of the research will be discussed within the context of broader literature, and the study limitations as well as possible avenues of future research will be presented.

2. Literature review and conceptual framework

Considering TQM as a source of competitive advantage has been proposed by numerous studies (Spitzer, 1993; Powell, 1995; Reich, 1994; Reed *et al.*, 2000; Abdi *et al.*, 2008). This is consistent with the RBV which suggests that attaining and maintaining a sustained competitive advantage requires the availability of strategic resources that are heterogeneous in nature, not perfectly mobile, not imitable, and non substitutable without great effort (Barney, 1991). Examples of such rare and non-imitable resources could be the appropriate use and allocation of core competences (López, 2005) or the reconfiguration of organizational routines so as to respond better to the dynamic and rapid changes of the market (Eisenhardt and Martin, 2000). TQM entails practices, such as empowering employees, investing in customer relations, and building effective communication channels.

In line with the contingency theory model (Sousa and Voss, 2008), we propose that the relationships suggested in the first research question can be seen as contingent relationships. Contingency variables can be seen as external or internal variables. Benson *et al.* (1991) used organizational variables related to the quality context to examine

their relationship with quality management; Foster and Ogden (2008) examined how quality management is approached in supply chain management context and Sila (2007) referred to the scope of operations (strategic context) and the firm size as the main contextual factors (contingency variables). A number of researchers have considered the strategic contingencies that may affect the practice (TQM) – performance relationship (Ketokivi and Schroeder, 2004; Garengo and Bititci, 2007; Sousa and Voss, 2008). Based on the above and our research questions, we propose a contingency based conceptual model, which is shown in Figures 1 and 2. In Figure 1, the strategy is the quality management strategy implemented in the company (Reed *et al.*, 2000), and the contingency variables are the differentiation and cost leadership strategies adopted by the organization. In Figure 2, the strategy is the cost leadership or differentiation strategy, and the contingency variables are the hard and soft TQM. In both cases, the performance would be the operational performance level desired by the organization.

TQM can be viewed as a company-wide, holistic management philosophy that covers all the business operations and seeks to continuously improve them from resource procurement and acquisition all the way up to the provision of customer support and after sale service (Kaynak, 2003). Other researchers (Waldman, 1994; Mehra *et al.*, 2001) consider TQM a management strategy that is continuous and dynamic in nature. Ryan and Moss (2005) suggest that TQM success lies in viewing it as a holistic process rather than a selective or contingent process. This holistic approach is what the authors refer to as the “core” strategy that makes the firm more successful than its peers. This paper adopts Kaynak’s (2003) definition of TQM and supports the holistic approach suggested by Ryan and Moss (2005).

Theoretically speaking, considering the multi-disciplinary nature of research into TQM (Wankhade and Dabade, 2010; Dalrymple *et al.*, 1999), one can find a vast array of assumptions and conceptualizations. Based on this, the study adopts two theoretical views:

- (1) the contingent framework (e.g. the relationship between TQM and the environment or the firm’s strategy); and
- (2) the RBV of the firm (Barney, 1991).

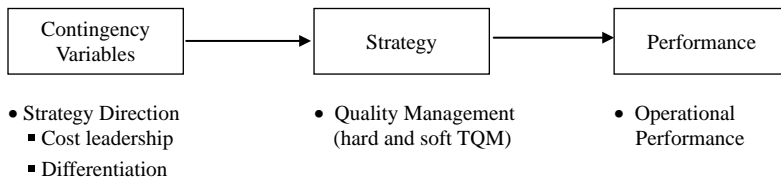


Figure 1. Contingency theory framework for TQM-strategy-performance: strategies as contingency variables

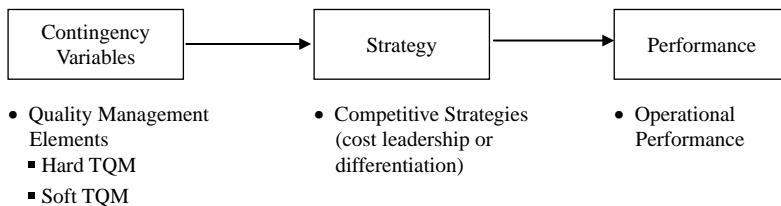


Figure 2. Contingency theory framework for TQM-strategy-performance: TQM elements as contingency variables

According to Boselie *et al.* (2005), there is an overlap between the two in the literature. Accordingly, they both reflect the assumptions behind what TQM is and what it provides the firm with:

- (1) It responds to the organization's strategies and systems (i.e. the contingency view).
- (2) It contributes to "added-value" through influencing the strategy choice process and, accordingly, the strategic development and deployment of the firm's inimitable, rare, and un-substitutable resources embodied in effective leadership, employees' capabilities, customer relations, and enhanced operations, among others (i.e. the RBV of the firm).

This study explores the two views in the TQM-strategy-performance, and argues that while both apply in organizational contexts, the relationships derived from the second view are probably stronger.

With this in mind, this research is aimed at testing the linkage between TQM, strategy, and operational performance. To achieve this objective, two scenarios will be considered. The first scenario requires considering TQM a driver to the strategy choice process, i.e. a catalyst for selecting a corporate strategy (Leonard and McAdam, 2001). The second scenario views TQM as an organizational factor that mediates the strategy-performance relationship (Prajogo and Sohal, 2006).

Examining the impact of TQM on performance, various studies presented mixed results, with few suggesting that it entails excessive amounts of management time, incurs a lot of training costs, does not adequately address the needs of small firms, focuses on process rather than results (Schaffer and Thomson, 1992), and makes unrealistic assumptions about most organizations' abilities or readiness to change their cultures (Powell, 1995 adopted from Bleakley (1993)). The majority of studies, however, reported a direct relationship between quality management practices and performance (Nair, 2006). The latter group argue that the successful implementation of TQM results in improved product and service quality, more effective and efficient process design, reduction in the waste of resources, and thus higher productivity. Table I presents a list of studies on TQM and its relationship with performance and strategy, the performance measure used, the TQM components, the methodology adopted, the main analysis technique employed, and the main findings of the study.

3. Hypotheses development

A number of observations can be made from Table I. First, performance measures used by various researchers may refer to operational or financial performance (Hendricks and Singhal, 1996; Carr and Kaynak, 2007), more comprehensive business characteristics (Franco-Santos *et al.*, 2007), or subjective performance (Powell, 1995; Joiner, 2007; Macinati, 2008). Second, Table I indicates that previous research emphasized various TQM elements. For example, Brah *et al.* (2002) and Joiner (2007) emphasized the human elements, whereas Leonard and McAdam (2001) emphasized the operational and organizational factors. However, examining each dimension separately and investigating its impact on performance may not contribute to a holistic approach for studying these relationships (Rahman and Bullock, 2005). Other researchers supported this contention. Reed *et al.* (2000) viewed the TQM components as process and content, with the former emphasizing tacitness and complexity (Powell, 1995; Reed *et al.*, 2000) and the latter emphasizing product quality or process efficiency (Reed *et al.*, 1996). Very similar to the

Paper	Relationship examined	TQM components	Performance measure	Method	Analysis technique	Main findings
Brah <i>et al.</i> (2002)	TQM-performance	Tools and techniques Behavioral factors	Subjective evaluation of quality performance, employee satisfaction, and customer satisfaction	Survey	Zero-order and partial correlation	TQM implementation correlates with quality performance
Demirbag <i>et al.</i> (2006)	TQM-performance	Quality data and reporting; top management; employee relationships; supplier quality management; training; quality policy; process management	Organizational performance and financial performance	Survey	SEM	Strong positive relationship between TQM and non-financial performance Weak influence of TQM practices on financial performance
Easton and Jarrell (1998)	TQM-performance	Process focus; systematic improvement; company-wide emphasis; customer focus; management-by-fact; employee involvement; supplier relations; recognition of TQM as a critical competitive strategy	Financial performance	Interviews	Descriptive analysis and comparison of performance with and without TQM	Performance, represented by both accounting variables and stock returns, is improved for TQM-adopting firms
Ei Shenawy <i>et al.</i> (2007)	TQM-strategy competitive advantage	Top management commitment/leadership; team; culture; training/education; process efficiency	Cost reduction; increased market share; financial performance; product quality; customer satisfaction	Meta-Analysis	Correlation, regression	Each individual TQM component is significantly associated with competitive advantage
Joiner (2007)	TQM-performance	Employee involvement; reduction of non-value added activities; reliable delivery focus	Organizational performance	Survey	Correlation, regression	Strong positive relationship between TQM and performance TQM-performance relationship is moderated by organization support and co-worker support

(continued)

Table I.
List of studies related to the relationship between TQM, strategy, and firms' performance

Paper	Relationship examined	TQM components	Performance measure	Method	Analysis technique	Main findings
Jung <i>et al.</i> (2009)	Strategy-TQM-performance	Leadership; employee relation; customer/supplier relations; product/process management	Continuous improvement; international project management (CIIPM)	Survey	Path analysis	Competitive strategy influences CIIPM only through the mediation of TQM practices HR-based TQM practices have a stronger influence on CIIPM than technology-based factors TQM has positive effects on performance
Kaynak (2003)	TQM practices-performance	Training; management leadership; employee relations; quality data and reporting; supplier TQM; process management; product/service design	Perceptual measures of financial performance, quality performance, and inventory management performance	Survey	SEM	
Leonard and McAdam (2001)	TQM-strategy	Strategic factors; tactical factors; operational factors	–	Case study analysis	Grounded theory inductive approach	TQM is a catalyst for the strategic planning process
Macinati (2008)	Quality management systems-performance	Top management commitment; quality strategic planning; personnel development; employee participation; quality information; supplier quality; process management	Financial performance, operational performance; outcome subjective performance	Survey	EFA; Canonical correlation Analysis	Quality management positively related to subjective performance but not significantly correlated to financial performance
Mehra <i>et al.</i> (2001)	TQM-strategy-performance	Human resources, management structure, quality tools, supplier support, customer orientation	Global competitiveness	Literature search	–	Quality based strategic management systems lead to global competitiveness

(continued)

Paper	Relationship examined	TQM components	Performance measure	Method	Analysis technique	Main findings
Nair (2006)	TQM-performance	Management leadership; people management; process management; product design and management; quality data analysis; supplier quality management; customer focus	Financial performance; operational performance; product quality; customer service	Meta-analysis	Meta-analysis of correlations	Positive association between TQM and performance Contextual factors and interaction effects of TQM practices moderate the TQM-performance relationship
Powell (1995)	TQM-competitive advantage	Tools and techniques (process improvement, benchmarking) Tacit resources (employee empowerment, executive commitment)	Subjective evaluation of financial performance	Survey	Zero-order and partial correlation with and without TQM	Only tacit, behavioral, and imperfectly imitable TQM features lead to competitive advantage
Prajogo (2007)	Competitive strategy – performance	–	Quality performance	Survey	Multiple regression analysis	Product quality predicted by differentiation strategy, not cost leadership strategy Cost leadership moderates differentiation – quality relationship
Prajogo and Sohal (2004)	TQM – performance	Mechanistic elements (hard) Organic elements (soft)	Quality performance and innovation performance	Survey	SEM and ANOVA	TQM mechanistic elements are paired with quality performance (improvement and efficiency) TQM organic elements are paired with innovation (differentiation)

(continued)

Table I.

Paper	Relationship examined	TQM components	Performance measure	Method	Analysis technique	Main findings
Prajogo and Sohal (2006)	TQM-strategy – performance	Leadership, strategy and planning, customer focus, information and analysis, people management, and process management	Product quality, product innovation, process innovation	Survey	SEM	TQM is positively – significantly related to differentiation strategy TQM partially mediates the relationship between differentiation strategy and performance Strong positive relationships between soft TQM and hard TQM elements
Rahman and Bullock (2005)	TQM – performance	Soft TQM dimension: workforce commitments, shared vision, customer focus, use of teams, personnel training, cooperative supplier relations	Organizational performance	Survey	Simple and hierarchical regression	Hard TQM dimensions: computer based technologies, just-in-time principles, technology utilization, and continuous improvement enablers Hard TQM mediates the relationship between soft TQM and performance
Reed <i>et al.</i> (2000)	TQM-competitive advantage	Content (design efficiency, product reliability, process efficiency) Process (leadership, training and education, teams, culture)	Cost reduction; enhanced differentiation	Theoretical study	Literature seminal analysis	Tactiness and complexity inherent in TQM process generate barriers to imitation, thus enhancing sustainable advantage

(continued)

Paper	Relationship examined	TQM components	Performance measure	Method	Analysis technique	Main findings
Salaheldin (2009)	TQM-performance	Strategic factor; tactical factors; and operational factors	Operational and organizational performance	Survey	SEM	Strategic factors have a central role in the successful implementation of TQM TQM has a positive and significant effect on operational and organizational performance There is a relationship between TQM practices and TQM practices have positive impact on performance
Tari <i>et al.</i> (2006)	Quality management practices-quality outcomes	Leadership; quality planning; HRM; supplier management; customer focus; quality tools and techniques; learning; process management; continuous improvement	Subjective evaluation of improvements	Survey	Path analysis	

Table I.

process and content elements are, respectively, the soft and hard TQM elements considered by Boyne and Walker (2002) and Rahman and Bullock (2005). According to the authors, hard techniques are pertinent to production and operations management (e.g. using performance standards or statistical techniques to assess quality). Soft elements, however, include qualitative approaches of leadership, customer orientation, training, employee involvement and team work.

Reed *et al.* (2000) argued that the two components of TQM (process and content) interact with each other, and it is this interaction that generates the desired performance level in the organization. The authors contended that the content component contributes to competitive advantage, while the process component generates sustainable advantage. This conforms to the RBV of the firm, and considers TQM elements as either a source of differentiation/cost leadership advantage, or a generator of barriers to imitation given their inherent complexity and tacitness (Douglas and Judge, 2001; Reed *et al.*, 2000; Powell, 1995).

In terms of hard and soft TQM, earlier research reported mixed results regarding the relationship between hard TQM and performance. Some researchers found that hard TQM has strong impact on organizational performance (Sitkin *et al.*, 1994), while others reported weak or no relationship between TQM and performance (Powell, 1995). Fotopoulos and Psomas (2009) argued for the primary role that soft TQM plays in achieving quality improvement and better market position for the company. The authors found that hard TQMs play a secondary role. In a similar vein, soft TQM elements were found to affect the continuous improvement of international project management (Jung *et al.*, 2009), and Rahman and Bullock (2005) found that the soft TQM elements have a direct and significant relationship with organizational performance. The study also suggested that hard TQM elements are significantly related to soft TQM. This, according to the authors, means that soft TQM has a direct effect on the diffusion of hard TQM. Based on the theoretical framework and the above discussion, the following hypotheses could be stated:

H1a. Soft TQM has a direct effect on performance.

H1b. Hard TQM has a direct effect on performance.

H1c. Soft TQM is positively related to hard TQM.

TQM practices have also been examined in terms of their relationships with strategy, and some researchers suggest that TQM influences the firm's strategy (Leonard and McAdam, 2004). The authors contend that TQM can be viewed as a useful catalyst for formulating corporate strategy and for effecting change in the organization. This positive effect may result from the positive impact on firm costs and differentiation levels (Molina-Azorín *et al.*, 2009). Given the multidimensionality of TQM, it is hard to associate TQM exclusively to either cost leadership or differentiation strategy. Accordingly, organizations adopting different strategies will implement TQM with different emphasis on certain elements. Prajogo and Sohal (2001) argue that there is a relationship between an organization's strategy and TQM elements. Such relationship is inherent in the strategic choice theory (Child, 1997), since it involves strategic decisions and choices regarding what leads to and what constitutes an effective performance in the organization (Dyck and Neubert, 2010). Within this perspective, TQM allows firms to develop the flexibility needed to recognize opportunities to enhance differentiation and reduce costs (Hitt *et al.*, 2011).

Studies dealing with TQM and linking it to strategy have followed the approach of examining this in the light of these two competitive strategies, the differentiation and the cost leadership (Jung *et al.*, 2009). If viewed as a catalyst (Leonard and McAdam, 2004), then TQM practices (soft and hard) will most probably influence the strategy choice process in the organization, making it more customer focused or more innovation centered, for example. The argument is based on the view supporting TQM as a holistic management philosophy (Kaynak, 2003), implying that TQM practices may probably influence strategy choices that involve the development of human capital in the organization and that stimulate the kinds of operations that actually constitute an advantage (Reed *et al.*, 2000). The current study adopts the two competitive strategies examined by Prajogo (2007), namely differentiation and cost leadership strategy. Looking specifically at the TQM components and examining their relationship with performance through the two competitive strategies, previous research suggests that the content elements of TQM can produce a cost leadership or differentiation advantage (Reed *et al.*, 2000). Other research argues that the influences from cost leadership strategy to hard TQM elements are weak and not significant (Jung *et al.*, 2009). Edelman *et al.* (2005) contend that human resources in terms of functional expertise and top management team education (soft TQM element) are positively and significantly related to the firm strategy of innovation and of quality/customer service (differentiation strategies). A study conducted by Fuentes-Fuentes *et al.* (2007) examined the relationship between various TQM dimensions and competitive strategies. The authors found that hard TQM dimensions are weakly and mostly insignificantly related to cost leadership strategy, whereas most of the soft TQM dimensions were related to differentiation strategic orientations. Edelman *et al.* (2005) argue that strategies play a mediating role between firm resources and firm performance. This is supported by both the RBV of the firm as well as by the contingency theory as discussed earlier. In this vein, TQM is viewed as a strategy choice driver (first scenario: Figure 1), and the following set of hypotheses could be set:

- H2a.* Soft TQM is positively related to differentiation strategy.
- H2b.* Soft TQM is positively related to cost leadership strategy.
- H2c.* Hard TQM is not significantly related to differentiation strategy and cost leadership strategy.
- H2d.* Differentiation strategy has a mediating effect in the soft TQM-performance relationships.

In addition, a firm's strategy (quality/customer service) is reported to enhance a firm's performance, especially if it is well co-aligned with its resource profiles (Edelman *et al.*, 2005). Previous research found direct relationship between strategy formulation and organizational performance (Porter, 1991; Prahalad and Hamel, 1994; López, 2005). Such relationship is inherent in the dynamic strategy theory (Porter, 1985; Porter and Millar, 1991). Some researchers examined TQM as a strategic resource that shapes the strategy formulation process in an organization and thus leads to sustainable competitive advantage (Powell, 1995). In addition to this, a study on the relationships between competitive strategies and quality found that quality performance is predicted by the differentiation strategy and not by cost leadership strategy (Prajogo, 2007). Reed *et al.* (2000) contend that tacitness and complexity (soft TQM) are necessary for sustainable advantage. These findings open the way for the following hypotheses to be set:

H3a. Differentiation strategy is directly related to performance.

H3b. Cost leadership strategy is not directly related to performance.

The second scenario (Figure 2) views TQM as a mediator in the relationship between corporate strategy and operational performance. This scenario is also based on the RBV and contingency theory of the firm. In testing its mediation effect, the existence of TQM as a “significant intervening mechanism” between an antecedent (e.g. firm strategy such as customer service) and operational performance is examined (Edelman *et al.*, 2005). If the mediation effect exists, then the mediator factor (TQM, both soft and hard) accounts for a significant proportion of the strategy-performance relationship. Prajogo and Sohal (2006) found that TQM is positively and significantly related to differentiation strategy, with a partial mediating effect between differentiation strategy and performance. Jung *et al.* (2009) reported a stronger influence of soft (human-resource based) than of hard (technology-based) TQM elements on project management performance.

Also, studies show that when a resource-performance relationship is examined, the strategy will play a mediating role (Edelman *et al.*, 2005). Therefore, when TQM is viewed as a strategic resource (i.e. a mediator in the strategy-performance relationship), the following hypotheses could be set:

H4. Differentiation strategy is directly related to soft TQM and hard TQM.

H5. Cost leadership strategy is directly related to soft TQM and hard TQM.

H6. Soft TQM mediates the relationship between differentiation strategy and performance.

H7. Hard TQM does not mediate the relationship between differentiation strategy and performance.

4. Methodology

4.1 Survey and data collection

In order to test the above stated hypotheses, measurement scales were developed, tested, and applied. The measurement scales consist of items representing White's (1986) competitive strategy scale, the MBNQA criteria for TQM, and performance dimensions that the authors adopted from Dean and Snell's (1996) operational performance scale. The competitive strategy scale included “differentiation strategy” items representing competitive aggressiveness in the market, initiating a culture of innovation in the company, and the risk taking tendency. The cost leadership strategy scale contained items measuring the degree to which a company is a low price provider, involved in decisions for price cutting, and whether it has a cost control system involving employees' participation. The TQM scale comprised 16 items that are related to top management and leadership, employee relations, customer satisfaction measurement, and product/process management. Finally, the operational performance scale included items related to continuous improvement efforts, as well as operational management efficiency and effectiveness. The authors conducted expert interviews and a pilot study in one company. Based on this, the content validity of the scale was checked and improved. Also, the scale was tested for both construct loadings and reliability, and the scale and its subscale items proved to have high loadings (> 0.5) and high reliability

(Cronbach's $\alpha > 0.7$) (Hair *et al.*, 2006). The instrument constructs, corresponding items, their factor loadings, and construct reliability are presented in Table II.

4.2 Sample

Based on the nature of the study, the target population was managers with middle and senior level positions working in companies that had adopted TQM practices. Having international operations management experience, the respondents were expected to be familiar with quality practices and to be involved in the process of operational performance evaluation (Germain and Droge, 1997). Using Convenience sampling through the assistance of the American Chamber of Commerce network, 650 questionnaires were sent to mid and senior level managers working in the USA, Mexico, Korea, and China, with a cover letter that ensured the anonymity of answers and that included a brief explanation of the research. Out of the 650 questionnaires, 268 were returned yielding a response rate of 41.2 percent. The 268 respondents represented 268 managers of strategic business units (SBUs) or projects in the four mentioned countries. Moreover, contacting 30 non-respondents revealed the lack of time as the major reason for not filling out and sending back the questionnaires. Using the demographics values and running a χ^2 test allowed for a comparison between responding and non-responding subjects. The lack of significant differences in the demographics indicated that non-respondents did not significantly differ from respondents, implying that the study has no significant response-bias.

Construct	Items	Cronbach's α	Loadings
Differentiation strategy	Aggressive competition	0.757	0.762
	Innovation		0.643
	Risk taking		0.788
Cost leadership strategy	Low prices	0.713	0.819
	Price-cut decisions		0.830
	Cost control system		0.659
Leadership	Management support	0.779	0.672
	Mission statement		0.699
	Unity of purpose		0.618
Customer/supplier relations	Effective planning	0.813	0.692
	Anticipate customer needs		0.754
	Supplier partnership		0.629
	Customer/supplier process		0.770
Employee relations	Customer satisfaction measure	0.842	0.697
	Employee compensation		0.813
	Employee involvement		0.757
	Effective communication		0.784
Product/process management	Employee training	0.824	0.638
	Product/process methodology		0.817
	Employee performance measures		0.686
	Quality data		0.699
Operational performance	Scientific management	0.828	0.819
	Continuous improvement		0.536
	Meeting specifications		0.749
	Timely delivery		0.780
	Within budget		0.769

Table II.
Factor loadings
for competitive
strategy, TQM, and
performance items

The sample demographics showed that the responding companies belonged to both manufacturing and service sectors. Such cross-industry sample fits the study purpose as manufacturing companies have become more customer-oriented and responsive, and the service companies have become more aware of quality processes and outcomes (Kaynak, 2003). Approximately, 37.7 percent of the responding companies operate in the USA; 35.8 percent in Mexico; 14.2 percent in Korea; and 12.3 percent in China. Further, 66 percent of the responding companies had more than 20 employees, and 84 percent had six months to one-year duration of experience in strategy-quality related projects. As for age, the highest percentage was respondents between 31 and 40 years old, 28.3 percent were less than 31, 19.3 percent between 41 and 50 years old, and 9.9 percent over 50.

4.3 Data analysis

Data analysis was performed using SPSS and AMOS. First, the assumption of multivariate analysis was tested for the variables to be used in the measurement model, and no statistically significant violations were found. Then to establish the uni-dimensionality of factors, an exploratory factor analysis using principal component analysis with Varimax rotation was done to check the loadings of the various TQM items into their factors. Results, shown in Table II, demonstrate that the different items loaded highly into the different constructs, thus illustrating the convergent validity of the instrument used. The direct and indirect relationships and effects amongst variables in the TQM-strategy-performance model were examined. The first three items in Table II represent the differentiation strategy, and the second three represent the cost leadership strategy. After that, the TQM scale items were grouped into four factors, the first four represent the top management/leadership factor, the second four comprise the customer/supplier relationship factor, followed by four items for employee relations, and four items for product/process management. Finally, the performance items were all grouped into one factor. The latent variable analysis was conducted to test two structural models related to the TQM-strategy-performance relationship.

Prior to evaluating the structural equation models, the validity of the measurement models for soft TQM, hard TQM, differentiation strategy, cost leadership strategy, and performance was tested using a confirmatory factor analysis for each construct along with the indicators obtained from the exploratory factor analysis. This step was done before testing the full latent variable path analysis model. So, the measurement model for each construct was estimated separately, and then the SEM for the factors along with the measurement models was estimated. The assessment at each step was performed using the modification indices and a set of goodness-of-fit statistics (Hair *et al.*, 2006).

5. Results

AMOS 16 software was used to test the two proposed research models. The fit indices used in this study are χ^2/df , RMSEA, CFI, TLI, and PNFI. The values of these indices as pertinent to the two research models along with the recommended values of these indices for a goodness of fit of these models are listed in Table III. The results show that the model incorporating TQM as a driver has a goodness of fit with the data, whereas that depicting TQM as a strategic resource (mediator in the strategy-performance relationship) is only marginally fit. The CFI and the TLI, which are recommended to be > 0.9 to illustrate a goodness-of-fit are a bit lower (0.892 and 0.860, respectively), and the RMSEA (expected to be < 0.08) turned out to be 0.089 for the model with TQM as a mediator. This indicates that

the two models are complementary to each other: TQM is an organizational culture influencing strategy choice, and hence, operational performance. Simultaneously, it is a resource deployed by an organization's strategy to achieve competitive advantage.

The latent variable path analysis results of the relationships between the performance, TQM components, and strategy constructs are shown in Figures 3 and 4. Figure 3 shows the relationships (direct and indirect) with the assumption that TQM is playing the role of a driver to the strategy choice process.

This model shows goodness-of-fit, with all indices meeting the required criteria (Hair *et al.*, 2006). Each path in the figure indicates the estimated path coefficient. These coefficients, or path estimates (PE), along with their associated significance levels (*p*-value) indicate the impact strength and significance of each independent variable on the target dependent variable. The model shows that soft TQM is positively and significantly related to the differentiation strategy of the firm (PE = 0.85, *p*-level < 0.01). The soft TQM also has positive relationship with cost leadership strategy (PE = 0.56, *p*-level < 0.05). A highly significant and positive relationship is also shown between soft TQM and the performance measure (PE = 0.94, *p*-level < 0.01). These results support *H1a*, *H2a*, and *H2b* and confirm the results reported by Reed *et al.* (2000), Boyne and Walker (2002), Rahman and Bullock (2005) and Jung *et al.* (2009), which emphasized that the process elements and the soft components of TQM support the competitive strategies of the firm and enhance its operational performance. In addition to this, and in corroboration with the findings of Rahman and Bullock (2005), soft TQM was found to be positively and significantly related to hard TQM (PE = 1.17, *p*-level < 0.05), which supports *H1c*. Also, the differentiation strategy has a direct effect on performance (PE = 0.27, significant at the 0.1 level). However, the cost strategy does not have a significant effect on performance (although it is direct: PE = 0.08, *p*-level = 0.264). These results support *H3a* and *H3b*, and confirm the findings reported by Prajogo (2007) that performance is significantly and positively related to differentiation strategy and not to cost leadership strategy. The differentiation strategy also has a partial mediating effect between the soft TQM and the operational performance, which gives support for *H2d*. This highlights the importance of differentiation in today's markets, where companies (manufacturing and service) strive to provide their customers with differentiated designs, performance, service, and support.

Consistent with Reed *et al.* (2000), hard TQM does not have a significant relationship with performance (PE = 0.12, *p*-level = 0.588), differentiation strategy (PE = 0.48, *p*-level = 0.609), or cost leadership strategy (PE = -0.09, *p*-level = 0.658), which also supports *H2c*, but does not support *H1b*. This could be attributed to the possibility

Goodness-of-fit statistics	Structural model 1 (TQM as a driver)	Structural model 2 (TQM as a mediator)	Recommended ^a value of fit index
χ^2/df	2.487	3.12	< 3.0
CFI	0.927	0.892	> 0.9
TLI	0.902	0.860	> 0.9
PGFI	0.596	0.595	> 0.5
RMSEA	0.075	0.089	< 0.08

Note: ^aHair *et al.* (2006)

Table III.
Goodness-of-fit indices

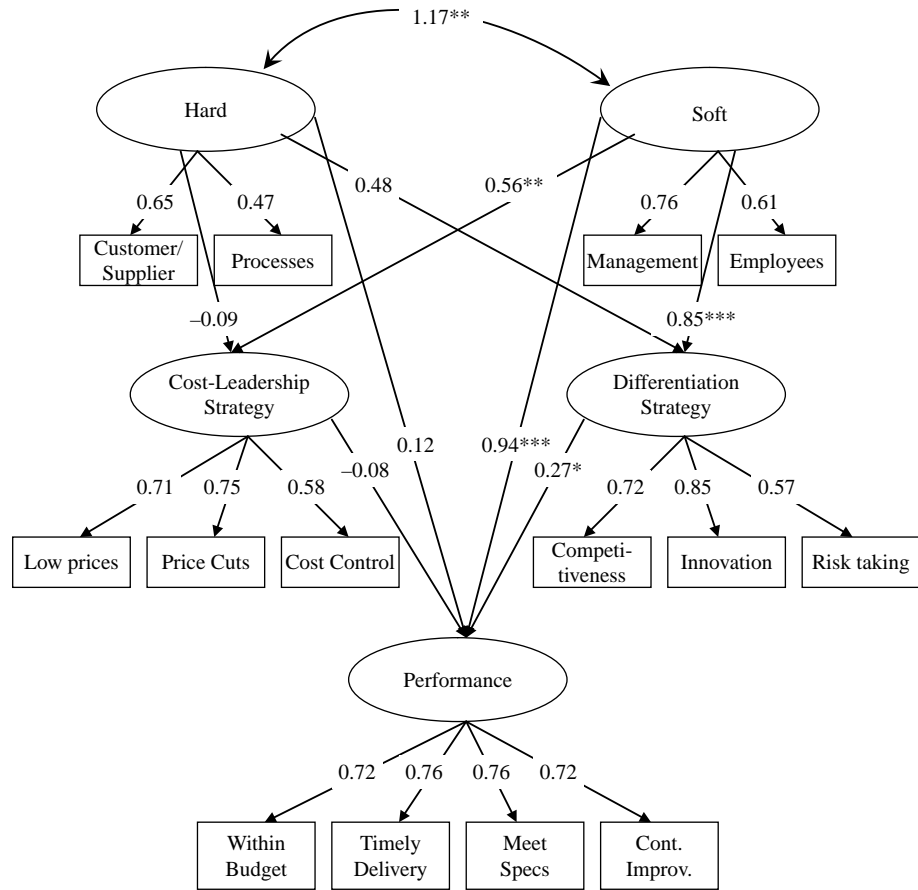


Figure 3.
Structural model
of the TQM-
strategy-performance
relationship (TQM as
a strategy choice driver)

Notes: Significant at: * $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$

suggested by Reed *et al.* (2000) that hard (content) TQM could be similarly deployed by several organizations; however, the soft (process) TQM, which incorporates tacitness and complexity, cannot be easily imitated or equally deployed in various organizations.

These results indicate that when TQM plays the role of a strategy driver, it will be viewed as a company-wide culture that instills a culture of innovation, effective communication, knowledge sharing, and employee involvement, and will thus have a potentially significant impact on the differentiation strategy and the operational performance of the company. Moreover, if TQM in its soft component is considered a driver or a catalyst to strategy choice, then the strategy will be expected to have a mediating role in the soft TQM – performance relationship (Edelman *et al.*, 2005). Soft TQM influences performance because it boosts continuous improvement and results in quality products, services, and processes that can enhance efficiency and effectiveness, timely delivery of projects, and objectives fulfillment. This, of course, would lead to competitive advantage. Within this view, TQM is assessed within the RBV framework,

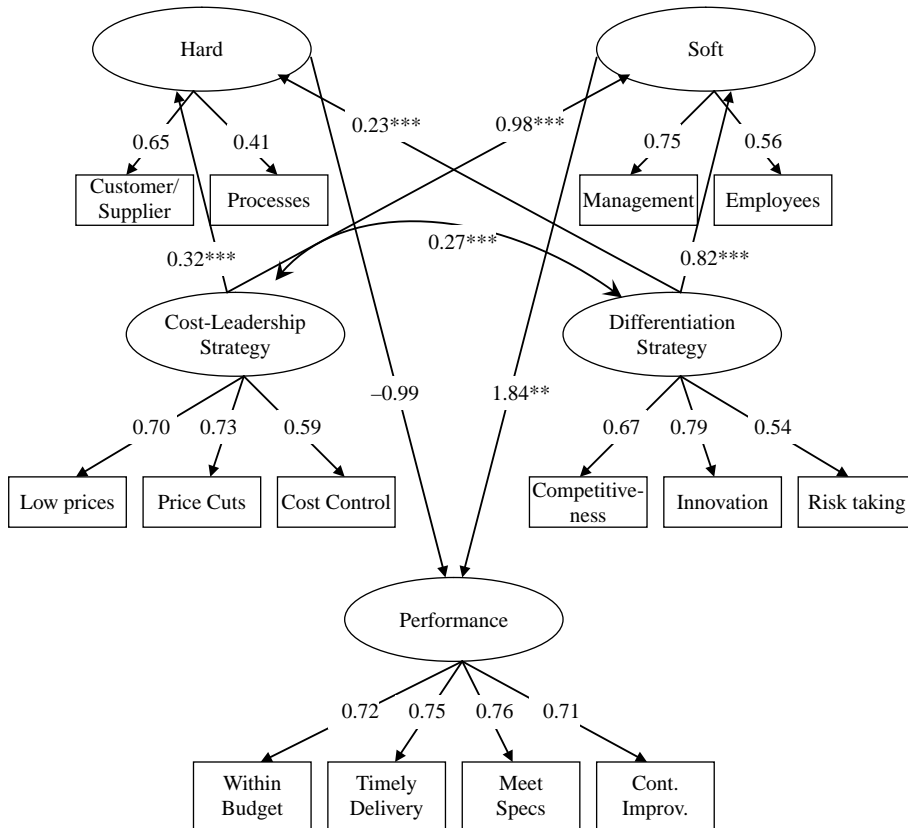


Figure 4. Structural model of the TQM-strategy-performance relationship (TQM as a mediator)

Notes: Significant at: * $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$

in that it reconfigures resources and enhances operations towards the achievement of better performance (López, 2005).

We next examine the results for the second scenario shown in Figure 4. This depicts the relationships between TQM, strategy, and performance (direct and indirect) building on the assumption that TQM is a strategic resource that a competitive strategy makes use of in order to attain and maintain competitive advantage. This model shows a marginal fit. Again here, each path indicates the estimated path coefficient. The model shows that there is a direct effect of differentiation strategy on the soft TQM (PE = 0.82, p -level < 0.01) as well as on the hard TQM component (PE = 0.23, p -level < 0.01) with its impact being, as expected, more on the soft TQM practices than on the hard TQM practices. A strategy that intends to produce unique and distinct products and services is therefore expected to use the TQM principles and practices, whether hard or soft, to attain competitive advantage. Within this framework, the organization understands that the attainment of competitive advantage can take place only through the implementation of TQM practices related to effective management/leadership, employee empowerment and involvement, enhanced

customer/supplier relations, and process management techniques. This result supports *H4* and conforms to the findings reported by Prajogo and Sohal (2006).

Moreover, according to this model, soft TQM plays a full mediation role between the differentiation strategy and performance. This supports *H6* and is in partial conformity with the findings of Prajogo and Sohal (2006), where the authors reported a partial mediation between the organization's differentiation strategy and its performance. This implies that the TQM elements should be supported and enhanced by a strategic framework that provides it with the needed resources, such as employee training, management development, and product/process design aids that will help it achieve its goals through which the competitive advantage could be achieved. In addition to this, the cost leadership strategy was also found to have direct and significant impact with both soft TQM and hard TQM components ($PE = 0.98$ and 0.32 , respectively, with p -level < 0.01). This supports *H5*, and is considered an interesting result since while a relationship could be expected between a cost leadership and hard TQM where processes and product designs could be restructured to be more efficient, the direct relationship between cost leadership strategy and soft TQM could be less expected. However, this relationship is important to be considered. For example, a cost leadership strategy may emphasize a learning atmosphere, whereby higher learning will be associated with less defect rates and lower maintenance costs. To continue with the model analysis, while cost leadership strategy significantly affects the implementation and use of hard TQM strategies, the hard TQM was not found to have a significant relationship with performance. This means that a cost leadership strategy does not achieve competitive advantage through hard TQM, but rather through soft TQM. Interestingly enough, this result supports *H7* and highlights the important role that tacitness and complexity (inimitable resources) have in achieving competitive advantage. While the tools, techniques, and control procedures and systems could be accessible to all companies, it is how these resources are used, through the abilities of empowered employees and commitment of visionary leaders that would make the whole difference. These results strongly confirm the findings of previous research (Reed *et al.*, 2000; Powell, 1995; Rahman and Bullock, 2005).

With all these results in mind, one can say that the two roles of TQM:

- (1) as an overall organizational culture and a strategy catalyst; and
- (2) as an important resource for a strategy to achieve competitive advantage – should be taken into consideration.

The results also indicate that working on and enhancing the soft component of TQM can be a critical factor in achieving competitive advantage. TQM should be looked at as a holistic process, but the driving factor represented in powerful and committed management and visionary leadership (Das *et al.*, 2011; Sila and Ebrahimpour, 2005) as well as in empowered and well involved workforce and team efforts can make a remarkable difference. It can also explain why certain TQM projects succeed while others fail.

6. Conclusions

With the globalization trend influencing how organizations set plans and operate to achieve their objectives, this study suggests the importance of incorporating TQM programs into the strategy choice process in order to continuously improve operations, customer relations, and overall performance. The main finding of this study is that TQM is both a driving force to competitive strategy selection and an important dynamic

resource that competitive strategies support, allocate, and enhance in order to achieve a sustainable competitive advantage. Accordingly, the two models complement each other, implying that the two roles played by TQM are important for driving organizational performance forward. When viewed in terms of soft and hard, it is found that soft TQM has a higher impact on competitive strategy choice as well as on achieving a better operational performance. This is because soft TQM comprise the major forces of change, innovativeness, and continuous improvement, namely, the tacit knowledge, experience, and problem solving abilities of people – both managers and employees. While interdependence among the TQM practices has been demonstrated in previous research, the role of soft TQM components, including leadership and employee relations, will be amongst the major forces driving organizations to the venues of success.

The significance of this study lies in the contingent approach it followed in the assessment of the role that TQM plays in the strategy choice process: is it a catalyst that shapes the strategy choice process, or is it a resource that needs to be used and supported by the organization's strategy to achieve competitiveness? The answer given by this study is: TQM is an organizational culture that plays a significant role in shaping the strategic thinking and thus the strategy choice process of an organization (Leonard and McAdam, 2001). At the same time, a competitive strategy of a firm can make use of the practices and principles of TQM to use the capabilities and competences of the human resources, systems, and processes in order to enhance the organization's performance (Prajogo and Sohal, 2006). In the former role, TQM should be viewed as an organization-wide philosophy that influences organizational operations, core processes, and strategy choice and implementation. However, in the latter role, TQM could be viewed as an important resource that a competitive strategy should support with other resources and capabilities for it to be successful and for the company to reap its benefits. The two roles complement each other to yield high operational performance, and in both, the emphasis is more on the soft TQM part than it is on the hard TQM part.

This study result can be useful to many groups, including TQM researchers, TQM project managers and designers, and organization's managers. As for TQM researchers, integrating the two roles that TQM plays in an organization in a holistic form that takes into consideration all the possible relationships will be enriching to this research stream. As for TQM designers and practitioners, understanding the links between TQM and the various organization's strategies and core processes could be mission critical for designing TQM projects that are well aligned to the culture of the organization as well as its strategic management processes. Finally, it is prudent for managers to understand the role that different TQM practices play in affecting the various competitive strategies and their selection processes. This is important if the organization deploying TQM aims at reaping the benefits of this powerful and strategic resource.

Despite the contribution and the significance of this study, it has several limitations. To start with, the respondents were selected using the convenience sampling technique. Although this was deemed necessary due to the nature of data collected, it has its drawbacks regarding the generalizability of the results. Also, the data were collected through self-report questionnaires, which constitute a major limitation to construct validity (Avolio *et al.*, 1991). The questionnaires ask for information to be reported by executives about their companies. Moreover, the relationship between TQM, strategy, and performance can change and evolve over time, especially that the setting is a dynamic one involving a vast array of behavioral, organizational, and environmental factors that might

all influence this relationship. However, the fact that the data we gathered from multinational organizations spread over several geographical locations may mitigate the impact of this limitation. Moreover, the study did not account for certain behavioral factors – related to employees' and managers' characteristics, attitudes, and experience levels – as well as organizational factors – such as structure, size, and business nature (Sila, 2007) – that play a moderating role in the relationships highlighted in this study. Finally, the use of perceptual data related to performance may have a bias effect on the study results. Nevertheless, Choi and Eboch (1998) argue that the use of perceptual performance measure, such as customer satisfaction, could also be useful.

In light of these limitations, future research is recommended to use mixed methods research in order to validate the results of this research, and apply a longitudinal study to better capture the relationships between TQM, strategy, and performance. Conducting a replication study with random sample selection can enhance the methodological rigor of the study and increase the possibility of having a better and a supported external validity. Also, another possible source of data could be the customers whose opinions, along with those of executives, can give a better insight of the TQM-strategy-performance relationship. Furthermore, taking into consideration certain factors that may have a moderating role in these relationships, such as the country culture, could enrich the research results. In addition, the interaction effect of both differentiation and cost leadership strategies should be considered as it may result in better competitive advantage and performance. Moreover, a combination of indicators related to organizational performance, as used by Rahman and Bullock (2005), may overcome the limitation of using one kind of performance measure. Finally, a replication of this study with the relationship between soft TQM and hard TQM taken into consideration will also be useful.

In conclusion, contemporary business challenges cannot be underestimated. It is through a proper strategy choice process that well incorporates TQM, and more specifically the soft elements of TQM, that organizations can attain and maintain continuous improvement as well as high performance levels. In fact, TQM is a major source of competitive advantage, whether it is viewed as a catalyst or a strategic resource; its impact on the organization's core processes, competitive strategy choice, and overall performance cannot be underestimated. However, just like any important and major endeavor in organizations, its success critically depends on the tacitness of those involved – managers and employees – that would facilitate a better deployment of the TQM tools and techniques to attain a sustainable competitive advantage for the firm. It is through this capability that TQM – both soft and hard, can become a way of life in organizations and make a difference in their performance.