

TQM Perspective in SMEs

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Abstract – The purpose of this study is to examine the different facets of TQM development in SMEs through the studies carried out worldwide. This study sought the approaches, criteria, practices inculcated in the development of TQM in SMEs with the impact on performance measures and innovation. The literature based paper reviewed different aspects related to successful implementation of TQM in SMEs. The in depth analysis of the literature cited formed the content that include aspects related to researchers and practitioners view point to understand the related researches etc. and the overall requirements in TQM implementation respectively for SMEs. The study highlights the very pertinent methodologies used by the researchers in studying TQM development in different contexts and reasoned categorically. The study also identified the focused and unexplored areas for future researchers in this area.

Keywords-Total Quality Management, Small to medium sized enterprises, Critical success factors, Innovation, SMEs.

1. INTRODUCTION

In today's era the changes in business environment is apparent through rapid technological advancement, e-business, internet revolution and globalization to name just a few (Hassan, 2010). These changes are driving firms to compete, simultaneously along different dimensions (Singh et al., 2008). Industries across the globe are changing to gain significant competitive advantage as change has indeed become a permanent feature of the business environment due to intense competition. Since the ability of organizations to adapt to their changing environment is key to long term success (Kumar and Wadood, 2004).

In view of these changes in the global market place, the management of the organizations reviews and adapts the prevailing practices and methodologies to remain competitive. The four factors that sought to alter or improve in manufacturing and service organizations are

technology, logistics, management systems and soft issues (humanistic) to help them sustain in the stiff competition. Their high degree of interdependence in the modern economic infrastructure enforced small and medium-sized enterprises (SMEs) to produce or create high quality goods or services (Ghobadian and Gallea, 1997). To achieve this organizations focus on the philosophy of quality management and have perceivance for quality in every phase of operations management related to products and services with a set of complex and interrelated processes which has been obtained using total quality management (TQM) concept (Lewis et al., 2006). TQM is an organization wide system, engage both the technical and cultural aspects (Ahmed and Schroeder, 2002) of the improvement process that took on different forms in each organization, influenced either externally by different market/customer focus or internally by different strategies and priorities (Wussow, 1993).

With fast changing expectations of customers for improved product and service quality, TQM forms an important basis for sustainable competitive advantage (Jaju et al., 2009). This indicates the necessity of quality for SMEs and many opt for it in which quality management is applied holistically, encompassing all parts of the organization and embracing the whole organization and all its processes, supporting efforts to create satisfied customers (Hansson et al., 2003) and contributes to profitability and growth (Sriram, 2010). The achievement of such benefits are enabled due to their inherent strengths to implement TQM successfully and therefore from the perspective of quality practices for TQM implementation it is of great interest to understand the different approaches of quality development, adoption of most critical success factors and to identify the methodologies used by the researchers for studying the different aspects of TQM in SMEs. The observations cited will be useful for practitioners and researchers alike for TQM implementation and research to be taken in SMEs respectively.

2. OVERVIEW OF TQM STUDIES IN SMEs

There are studies on TQM in SMEs related to different aspects such as impact on performance (Anderson and Sohal, 1999; Fening et al., 2008), critical factors for TQM (Yusof and Aspinwall, 2000c; Hellsten and Klefsjo, 2000; Rungasamy et al., 2002; Hansson and Klefsjo, 2003; Mallur and Hiregoudar, 2010) and categorization of factors (Gadenne and Sharma, 2009; Lewis et al., 2006), impact of ISO9000 and ISO 9001 on development of TQM (Rahman, 2001; Sohail and Hoong, 2003; Lewis et al., 2005), strategic and operational planning for TQM implementation (Temtime and Solomon, 2002), TQM impact on innovation (Trivellas and Santouridis, 2009), knowledge management impact on TQM (Chua et al., 2010; Nyakudya, 2011) and market orientation on TQM implementation (Demirbag et al., 2006a). This shows awareness, progress, and adaptability of SMEs to do more for their customers, do it faster and to do it more cost effectively (Mazur, www.mazur.com).

The thoroughly reviewed articles for the objectives of this study with their summary related to TQM implementation and other allied measures in SMEs are covered in table 1. The limited research papers summary have been cited and obtained from online databases that were searched extensively to identify articles published in distinguished journals.

2.1 Methods used

The TQM surveyed articles published by researchers' revealed use of exploratory methods to study their research problems. The appropriateness of exploratory methodology for quality management is because of their well understood of constructs (Edmondson and McManus, 2007). It is apparent from table 1 that the researchers have preferred to use survey and case study methods for their studies and relevant analysis methods such as regression analysis, factor analysis using varimax rotation, interpretive structural modeling (ISM), ANOVA, analytical hierarchical process (AHP) etc. for their empirical researches related to TQM and different outcomes and impact on overall performance.

2.1.1 Survey study method

Survey research has been accepted as a legitimate methodology for understanding the core issues and problems in operations management (Khanna et al., 2010). For survey studies questionnaire is the heart of survey operation (Kothari, 2006). The survey quality studies instruments either designed or derived from previously developed instruments comprised of the practices covered under different criteria. In general researchers used structured questionnaire based on organizations environment, quality attributes as the inputs and their

different performance measures. Such questionnaire composed of closed structure or open-ended items is used in survey research method to gather data from respondents thought to be representative of some population (Panneerselvam, 2004).

2.1.2 Case study method

Researcher's preferred case-study method in order to perform an in-depth cross case analysis and identify the significant differences exists in the quality management practices in SMEs (Kumar and Antony, 2008). They choose case investigation to get an in-depth analysis and look in person into a real life situation (Ahmed and Hassan, 2003).

The articles cited for the objectives of this study are based on survey method and case study method as evidenced from table 1. The case study method has the interview instrument (Yusof and Aspinwall, 2001) approach either tape-recorded or direct with the management personnel and in few cases with co-workers indulged in full implementation process at the different case organizations. Their views provide a wide spectrum of experience and expertise within their organizations and across various industry sectors (Lewis et al., 2005). In single case study method, researchers (Yusof and Aspinwall, 2000b; Mulhaney et al., 2004) focused on a case to perform an in-depth quality management analysis of a firm to yield more and better insights (Sandstrom and Svanberg, 2011). While in multiple cases, researchers (Hansson, 2001; Yusof and Aspinwall, 2001; Tannock et al., 2002; Hansson and Klefsjo, 2003; Lewis et al., 2005) mostly had the common features of comparison between the cases like favorable quality initiative, selection of the core values and practices with reasons, implementation process, techniques and tools, problems faced, extent of outcomes and analysis with the theoretical base. Many authors chose a multiple case study instead of a single one to increase external validity and reliability (Costa and Lorente, 2004).

2.2 Influence of ISO9000 for TQM in SMEs

Achieving ISO 9000 demonstrates that an organization has quality process and procedures in place (Coleman and Douglas, 2003). Managers consider that ISO certification helps in developing quality system, mainly because it results in streamlining of systems, processes and procedure in the organization (Srivastav, 2010).

Tannock et al. (2002) revealed that in Thailand with ISO certification, SMEs became more effective learning organizations. They had developed better appreciation of the concept and in most cases self-critically assessed their status on the basis of Thailand national quality award and progressed towards TQM. In Singapore the large majority of ISO 9000 certified SMEs were steadily

Table1. Summary of TQM studies on in SMEs

Author	Objective	Location / Sector	Units covered	Method of study	Analysis method used	Conclusion and recommendation
Anderson and Sohal (1999)	Examine TQM practices relationship with org. performance.	Australia Melbourne Manufacturing Service	62	Survey study	Friedman ANOVA, Cochran Q test	Customer focus influence on output quality
Yusof and Aspinwall (2000a)	Investigation of TQM implementation issues	Birmingham, UK Manufacturing	1	Case study	Categorization into TQM practices	Problems identified are financial and general resource constraint.
Rahman (2001)	Empirical evaluation of ISO and non-ISO SMEs in TQM context	Western Australia Construction/ Engineering, Manufacturing	49	Survey study	Criteria validity- factor analysis, t test	No significant impacts of TQM practices on organizational performance
Hansson (2001)	To increase TQM implementation knowledge for SMEs	Sweden Service and goods sector	9	Case study	Similarities and differences between cases studied	TQM begins with leadership, everybody's participation, customer & process orientation
Tannock et al. (2002)	Factors identification to achieve quality performance	Thailand Manufacturing	4	Case study	Pre and post TQM implementation assessment	Leadership, information systems, human resources, strategic planning, process management.
Sohail and Hoong (2003)	TQM practices assessment for org. performance of ISO/ non-ISO SME	Malaysia Construction Engineering, Chemical	80	Survey study	Factor analysis, t - test	ISO 9000 certification contributes to a higher organizational performance
Mulhaney et al. (2004)	Continuous improvement drive with use of ISO 9000	Britain Laboratory supplies firm	1	Case study	BPR model for CI	Key process indicators through reengineered processes for effective monitoring and control
Lewis et al.(2005)	Investigate the level of TQM attained in the ISO 9001 firms.	Trinidad and Tobago Service Manufacturing	4	Case study	Analytical Hierarchical Process	System deployment and continual improvement are the most important TQM criteria.
Demirbag et al. (2006a)	Determine impact of market orientation on TQM	Turkish Textile	141	Survey study	Confirmatory factor analyses	MO has positive impact on TQM implementation
Fening et al.(2008)	Relationship investigation for TQM practices and performance	Ghana	116	Survey study	Regression analysis	Quality management practices improve organizational performance
Gadenne and Sharma (2009)	Hard & soft quality practices association with org. performance	Australia Manufacturing Service	119	Survey study	MANCOVA analysis	Three hard and soft QM factors produced overall performance

progressed toward TQM (Quazi and Padibjo, 1998). Similar is the case in large industry as found by Costa and Lorente, (2004) where the quality journey began by implementing ISO 9000 first and then TQM adoption. Having ISO 9000 first is not hard and fast since it develops a culture which runs counter to the principles of continuous improvement and TQM (Meegan and Taylor, 1997).

2.3 Framework for SMEs

The early models such as EFQM, Deming, MBNQA and other models were designed using TQM principles. These most popular models are manifestations of principles of TQM implementation in the entire organization (Jha and Joshi, 2007). Many practitioners have used such models for implementing TQM while some researchers have used it as a proxy when analyzing the effect on performance of a TQM system. One of the probable determinants of its success is that it offers a clear framework, a terminology and a methodology that is not so clear in TQM (Gomez et al., 2011). It is imperative that an implementation framework should be developed that fits the purpose of small organizations and so paves the way for better TQM adoption in this sector (Yusof and Aspinwal, 2000b). The framework should be comprehensive, flexible and easy to adopt. Since success clearly depends on a combination of factors that are interrelated, the approach must be holistic, important, and at the same time has the impact that any change in one of the components will not have a negative effect on the overall system (Kanji, 2001).

2.4 Influence of soft and hard factors in SMEs

The basis of TQM is the core values which aim in establishing the quality culture (Hellsten and Klefsjo, 2000). The researchers Lewis et al., (2006); Gadanne and Sharma (2009); Trivellas and Santouridis (2009) have identified core values for TQM implementation and categorized into hard and soft aspects. Out of these two aspects, Lewis et al. (2006) found that the hard aspects of TQM were more popular in terms of their implementation than the soft aspects. They also reported that small and medium enterprises (SMEs) would be able to manage hard aspects of TQM better than soft aspects as they can be more easily quantified. But in general the two major problems being faced by most small manufacturing businesses as revealed by Yusof and Aspinwall, (2000c) are the first is financial and the second is a more general resource constraint, which in a broad sense includes time, manpower, technical expertise and managerial expertise.

2.5 Contribution of TQM in SMEs performance

The researchers of the TQM studies have been immensely interested to know the impact of quality practices on performance of manufacturing and service firms'. Because in theory and practice, TQM seems to assure performance

improvement for any organization and with success depends on facilitating conditions, TQM is called "the only source of sustainable competitive advantage" (Terziovski, 2006). For effective management of the organizations it is very essential to measure performance and according to Deming without measuring something, it is impossible to improve it. Therefore, to improve organizational performance, one needs to determine the extent of TQM implementation and measure its impact on business performance (Demirbag et al., 2006b). In view of this researchers test the impact of quality practices on performance parameters such as quality performance, supplier performance, customer satisfaction, employees' satisfaction, market results, financial results, product quality, service quality, employee performance, business performance etc. The most contributing factors for such performance measures and indicators in SMEs are shown in table 2. The inculcation of this requires SMEs to increase their knowledge about performance measurement and related tools and introduce them in harmony with strategic objectives (Sousa et al., 2005).

2.6 Quality practices in SMEs for TQM development

The critical factors of TQM found in the literature vary from one author to another (Draghici and Petcu, 2010) and all of these may not be essential for all SMEs (Su et al., 2008). Saraph et al.(1989) set a new direction for TQM researchers interested in the set of critical factors that constitutes TQM and are cited in many studies (Sila and Ebrahimpour, 2003). They pioneered the effort to identify empirically validated TQM constructs using the quality prescriptions of quality guru (Anh and Matsui, 2006). The constructs described by Saraph et al. (1989) are management leadership, role of quality department, training, product/service design, supplier quality management, process management, quality data and reporting, and employee relation.

Yusof and Aspinwall, (2000c) found the most commonly deployed factors in SMEs are leadership, employees' effectiveness and customer requirement while the least ones are strategic planning, tools and techniques and quality culture. Here, the unusual factors found were introduced to reflect the SMEs' situation. The main theme of the critical values and quality management practices covered under different critical success factors should be used for the proper focus and the correct goals to achieve them (Adams, 1994).

3. TQM IN MANUFACTURING AND SERVICE SECTOR

TQM principles and tools application in manufacturing companies spread through several levels and should be customized on the basis of the firm's history and of management's objectives (Mele and Colurcio, 2006).

Table 2. TQM core contributing factors with performance measures in SMEs

Authors	Most contributing factors in SMEs	Performance measures and variables in SMEs
Anderson and Sohal (1999)	Leadership	Quality of product or service, timeliness of delivery, productivity improvements
Yusof and Aspinwall (2000b)	Continuous improvement activities, ISO9002	Employees' education on TQM concepts
Ahmed and Hassan(2003)	Statistical and managerial methods	Process performance
Watson et al. (2003)	Employees number and commitment	Gross measures, profit margins, staff productivity
Demirbag et al.(2006b)	Training, Employee relations, Quality data and reporting	Financial performance, Non-financial performance
Fening et al.(2008)	Leadership, Strategic planning, Information and analysis, Human resource	Operational and business results
Gadenne and Sharma (2009)	Employee and customer involvement, Employee training and efficiency improvement	Return on assets, market share, customer satisfaction and improved overall performance
Azizan (2010)	Systems approach, Leadership, Human resources	Quality, delivery and cost
Singh (2011)	Top management commitment, Employee training	Product quality, Customer satisfaction
Related to ISO SMEs		
Rahman (2001)	Leadership, Process control, Employee empowerment and involvement	Organizational performance
Sohail and Hoong (2003)	Strategy planning, Customer management and quality satisfaction, Leadership	Organizational performance

Accordingly SMEs select the quality principles that characterize the culture of the organization and identify tools that are suitable as support to the principles (Hansson and Klefsjo, 2003). In manufacturing SMEs critical total quality practices are implemented with the SPC tools for both short and long term goals to locate the significant causes behind any defects in producing customer products. Firms with greater implementation of quality management tools can secure better performance than those with less implementation (Ahmed and Hassan, 2003).

The methods and techniques used in the manufacturing industries for TQM are equally useful in the public service, health care, education and hospitality industries (Magd and Curry, 2003). Service organizations providing intangible services are sceptical about TQM techniques and its adoption cost (Mehra and Rangnathan, 2008). Not only about TQM, even the small

service firms are least concern for improving their quality procedures with ISO 9000 compared to manufacturing sector (Yusof and Aspinwall, 2000b).

4. DISCUSSION

The studies conducted over the globe disclosed mixed outcome for the success of quality development in SMEs. Mainly the developed countries SMEs showed good result in implementation of TQM principles and tools as compared to developing countries. The researchers found developed SMEs mostly began with cost cutting, process improvement etc. quality initiatives implementation and moved on to deploy advanced quality system like ISO9000 series, TQM and six sigma. On the other hand there are many developing countries like Pakistan, Ghana, Africa having very little research on the topic while Srilanka, India and China indigenous

firms are lagging behind in total quality management. Different nations have different approaches to TQM since implementation of TQM are country dependent (e.g. culture) and firm specific (e.g. size and type of firms) (Sila and Ebrahimpour, 2002). But the bottom line concept is same throughout that is to achieve total quality in the overall operations of their firms (Ramudu, 2002).

5. CONCLUSION

From two sorts of SMEs with and without ISO 9000 certification, one with quality assurance certification has definite advantageous over the other in terms of total quality process. It is due to the promoting practices developed in such firms encourage them towards TQM. The companies with ISO9000 and continuing with TQM enhance employee motivation, operational efficiency and achieve overall organizational success and performance (Magd and Curry, 2003). This is sustained with the improved TQM culture that the organization is adapted into and gives impetus to the improved performance.

Researchers assessed TQM status in SMEs on the basis of total quality criteria to indicate the level of quality practices achieved under these criteria and the severity of improvement required for achieving customer satisfaction and performance. The varied factors covered by the researchers have verified and tested for their impact on the different parameters of firms' performance. Truly the researchers work would be useful for SMEs in order to inculcate the creation of the acute understanding and relevant knowledge on factors such as holistic development of SPC, continuous improvement, TQM advantage for innovation, employees' satisfaction and others.

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