The Effect of TQM on Organizational Performance in Manufacturing Organizations

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Abstract

Modern business environment is witnessing huge competition as the expectations of customers are changing in many ways. There has been consistent rise in the expectations of customer. The customers in the contemporary world are clearly conscious regarding the availability of latest technology and they expect organizations to leverage that technology to provide them with the quality products and services. Total Quality Management (TQM) is one of the important tools, which can help the organizations to integrate all its resources and meet those customer requirements. Therefore, TQM is gaining momentum and has become an integral philosophy of every business organizations. TQM is a management approach that aims at providing enduring success and achieving highest customer satisfaction through the constant delivery of quality products and services. The purpose of this research article is to test the conceptual model that addresses the association between TQM and organizational performance and to examine the strength of association between the two. The data for the present study was collected from 255 quality management personnel working in 58 manufacturing organizations from Belagavi hub of Karnataka state. Statistical techniques such as correlation analysis and multiple regression analysis were used to answer the proposed research questions. The results of the study found that there is a significant correlation exists between TQM and organizational performance. Further, TQM strengthens organizational performance.

Keywords: Innovation, Quality, Operations, Organizational Performance, TQM

Introduction:

The term quality conveys an important implication to both organizations as well as customers. Both manufacturing and service organizations have realized that their survival depends exceedingly on producing superior goods and services. From the customer's perspective, quality is the one, which satisfy or exceed customer expectations at the minimum possible cost. As a result, manufacturing and service organizations are persistently struggling hard to enhance the quality at every stage and accomplish the expectations of the customers. Therefore, these days TQM has become an integral philosophy of every business organization.TQM is a quality management philosophy and all-inclusive quality enhancement technique that every business organization is practicing for the purpose of improving overall performance in terms of cost and quality. Predominantly in the recent past TQM started receiving a great attention worldwide (Jung & Wang, 2006). According to Martinez-Costa et al, (2008), TQM strategy is a leading tool used for continuous improvement and for the enhancement of company's competitive advantage. The primary objective of this study is to examine the association between TQM and organizational performance. The study also aims to investigate the impact of TQM on organizational performance.

Literature Review:

TQM is the continual process of detecting and reducing or eliminating errors in manufacturing, rationalizing supply chain management and ensuring the enhancement of customer satisfaction.

Generally management of quality either in manufacturing sector or service section is considered to be the responsibility of quality personnel and not of an entire organization. Nonetheless the concept of TQM articulates that, management of quality involves the participation of an organization as a whole which emphases on continuous improvement right from the procurement of raw material till to the satisfaction of customers.

Essentially TQM practices function as an interdependent structure that is combined with other organizational assets to achieve competitive advantage (Hackman & Wageman, 1995). Huqand Stolen, (1998) was of the opinion that, TQM tools and procedures are equally useful for both manufacturing and service sectors. Belagavi is situated in Karnataka state and is

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known for manufacturing organizations. There are several TQM practices, which influences the performance of organizations. To name a few, top management commitment, customer satisfaction, total employee commitment, process approach, integrated system, strategic and system approach, supplier relationship, design of quality, employee empowerment, benchmarking, statistical process control, employee involvement and training (Dale & Cooper, 1994). TQM elements can be classified into two categories, namely soft and hard TQM elements (Rahman & Bullock, 2005). The soft elements include leadership, employee relation, employee involvement, customer focus, strategic quality planning, process management, continual improvement, data and information analysis and knowledge and education. On the other hand, the hard elements comprise elements like quality management tools and techniques, customer and supplier relationships (Fotopoulos & Psomas, (2009). To have an efficient effective TQM in place, an organization has to focus on both hard as well as soft elements of TQM.TQM stresses on continuous improvement and satisfying the customer needs and expectations. Goh and Ridgway (1994) significantly argued that organizations must struggle hard to satisfy their customer needs and wants with the lowest cost to remain competitive in the market. Rampersad (2001) in his research work mentioned that every employee in an organization should consider continuous improvement as the key to ensure customer satisfaction. According to Taylor & Wright, (2003) top management must understand the principles of TQM thoroughly and should envisage on the significance of internal management processes, employee involvement, training and development in the implementation of TQM practices

Sharma and Gadeene (2001) in their research work indicated that TQM is all-inclusive management philosophy and has a huge potential to impact organizational performance. According to Hendricks and Singhal (2001), while assessing the relationship between TQM and organizational performance, one should consider the causal linkages. Baldwin & Johnson, 1996 in their research proved that, TQM implementation enhances continual improvement and customer focus. Salaheldin (2009) revealed that the implementation of TQM has a significant positive impact on the performance of organizations. According to Singh et al, (2018), TQM elements are positively related to the performance factors of the Indian organizations. Further, the literature survey revealed that the effects of TQM on various indicators of organizational performance is not consistent, quality performance generally indicated strong and positive relations (Prajogo & Sohal, 2003). In addition, a research study conducted by Arumugam, Ooi, & Fong, (2008 found that TQM has a positive and significant relationship with quality performance. Innovation allows companies to adapt changes quickly and helps for finding new products, markets (Costa & Lorente, 2008). Sadıkoglu and Zehir (2010) found that the elements of TQM are significantly and positively associated with innovation performance. Prajogo and Sohal (2003) identified the relationship between TQM and innovation performance and showed that TQM enhanced innovation performance. Hung et al. (2011) conducted a research on high-tech industry of Taiwanese companies and noted that TQM has a positive and significant impact on innovation performance.

Danny Samson and MileTerziovski (1999) in their research could try to examine the relationship between TQM practices and operational performance and found that, the categories of management, management of people and customer focus are the significant predictors of operational performance Pinho,(2008) confirmed that there is an association exists between innovation and operating performance. Another study conducted by Jabbarzare H and Shafighi N (2019) indicated that TQM practices such as continuous improvement, customer focus and employee involvement are significantly associated with the performance of organizations. Amongst all the practices continuous improvement was considered as the most important TQM practice in terms of impact on organizational performance. Shafiq et al (2019) studied the effect of TQM on organizational performance in textile sector and found that TQM has high positive impact on organizational performance. The study further found that all the elements of TQM have positive relationship with financial and non-financial results. Though, the element of people does not have significant association with financial and non-financial results.

Conceptual Framework:

The literature survey revealed that, the role of TQM in innovation and producing quality products with the least cost is significant in manufacturing organizations. Further, the review of literature confirmed that the relationship between TQM and organizational performance has been found positive and significant in manufacturing organizations. The literature survey also helped the researcher to identify four important elements of TQM and three indicators of organizational performance. Research variables are presented in Table 1 and Figure 1 presents the conceptual framework for the study.

Table No. 1: Research variables of the conceptual model along with their indicators

Research Variables	Indicators
Total Quality Management (TQM)	Top Management Commitment (TMS)
	Customer Focus (CF)
	Quality Process Management (QPM)
	Continous Improvement (CI)
Organisational Performatnce	Quality Performace (QP)
(ORG PER)	Innovation Performance (IP)
	Operating Performace (OP)

Objectives Of The Study

- To examine the relationship between TQM and organizational performance
- To examine the impact of TQM on organizational performance

Research Questions

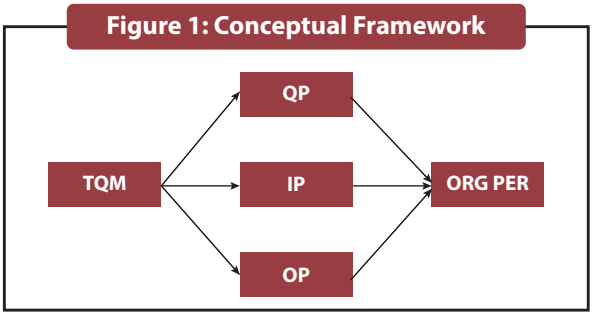
Research Question 1:
Does TQM relate to organizational performance?

Research Question 2:
What might be the strength of association between elements of TQM and indicators of organizational performance?

Methodology:

The study was carried out in Belagavi city of Karnataka state. Belagavi is a foundry hub of Karnataka state with more than 300 foundries producing automotive and industrial castings. These foundries support ancillaries like engineering, CNC and conventional machine shops which finish the castings that are produced in Belagavi. It is believed that Indian manufacturing and service organizations are too diverging in their focus on TQM practices. Therefore only manufacturing organizations such as foundry, engineering, food processing and machine shops are considered for the study. The list of manufacturing organizations located in Belagavi city was collected from Belgaum Foundry Cluster (BFC) and Belgaum Chamber of Commerce and Industry (BCCI). Convenience sampling method was adopted for the selection of manufacturing organizations. Further, manufacturing organizations were selected based on researcher's familiarity with the top management and willingness of these organizations to permit for conducting a survey. Finally, the sample consisted of 255 respondents from 58 manufacturing organizations was considered for the present study.

Figure 1: Conceptual Framework



Note: TQM - Total Quality Management
QP - Quality Performace **IP -** Innovation Performance
OP - Operating Performace
ORG PER - Organisational Performatnce

In the present study, a structured questionnaire was used to measure TQM and its elements. The scale comprised of 38 items and the items belonging to different elements of TQM were jumbled in order to minimize the respondent's bias. The participants were requested to rate the extent of presence of elements of TQM on five-point Likert scale (1 = No presence to 5 = complete presence).The organizational performance was measured using scale, which included three important indicators namely quality performance, innovation performance and operating performance. This is a 21items questionnaire which was measured on a five-point Likert scale (1 = strongly disagree to 5 = strongly agree). Data were analyzed using SPSS version 22.0. The Karl Pearson's correlation coefficients were calculated to examine the relation between TQM and organizational performance. Multiple regression analysis was run to analyze the extent of the effect of TQM on organizational performance.

Results

Scale Reliability

Reliability analysis was performed by calculating Cronbach's alpha. It is calculated to check the internal consistency of the scales used for the study. It was performed on both the elements of TQM and indicators of organizational performance. For the instrument to be reliable, the reliability coefficient has to be above 0.7. Four elements of TQM scale demonstrated 0.94 and three indicators of organizational performance scale showed 0.89 reliability coefficient. This indicates internal reliability and was adequate for further analysis.

Research Question1: Does TQM relate to organizational performance?

The results of Karl Pearson's correlation coefficients between TQM, elements of TQM, organizational performance and its indicators are presented in Table-I. It results showed that there was a positive and significant correlation between Total Quality Management and organizational performance ($r=0.73$, $p<0.01$).

Table No. 2: Correlation between TQM and its Elements, Organizational Performance and its Indicators

	TMC	CF	QPM	CI	TQM	QP	IP	OR	ORG PER
TMC	1								
CF	0.73**	1							
QPM	0.51**	0.74**	1						
CI	0.49**	0.60**	0.66**	1					
TQM	0.80**	0.91**	0.82**	0.61**	1				
QP	0.51**	0.20**	0.37**	0.36**	0.44**	1			
IP	0.44**	0.53**	0.65**	0.55**	0.50**	0.28**	1		
OR	0.57**	0.55**	0.55**	0.56**	0.57**	0.38**	0.64**	1	
ORG PER	0.61**	0.65**	0.82**	0.67**	0.73**	0.63**	0.79**	0.76**	1

** Correlation is significant at the 0.01 level (2-tailed)

* Correlation is significant at the 0.05 level (2-tailed)

The TQM scores showed significant and positive association with all the indicators of organizational performance namely, quality performance (r=0.44, p<0.01), innovation performance (r= 0.50, p < 0.01), and operating performance (r=0.57, p< 0.01). There was a positive and significant correlation between TQM and elements of TQM named as top management commitment (r=0.80, p<0.01), customer focus (r=0.91, p<0.01), quality management process (r = 0.82, p< 0.01) and continuous improvement (r = 0.61, p < 0.01).

Top management commitment showed a positive and significant correlation with indicators of organizational performance. There was a significant and positive correlation between top management commitment and quality performance (r = 0.51, p < 0.01), operating performance (r=0.57, p<0.01). Whereas top management commitment showed a positive correlation with other performance indicator namely, innovation performance (r=0.44, p< 0.01). Overall top management commitment reported a significant positive correlation with organizational performance (r=0.61, p<0.01). Another element of TQM namely customer focus reported a positive and significant correlation with organizational performance (r=0.65, p<0.01). In addition, customer focus showed a positive and significant association with indicators of organizational performance namely, innovation performance (r=0.53, p<0.01) and operating performance (r=0.55, p<0.01). While there was a low positive correlation between customer focus and quality performance (r=0.20, p<0.01). The correlation computation showed a high positive significant correlation between Quality process management and organizational performance (r=0.82, p<0.01). The results further showed that there was a significant positive correlation between quality management process and two indicators of organizational performance namely, innovation performance (r=0.65, p<0.01) and operating performance (r= .55, p<0.01), whereas there was a positive correlation exists between quality process management and quality performance (r=0.37, p< 0.01). Continuous improvement demonstrated a positive correlation exists between continuous improvement and quality performance (r=0.36,

Table No. 3: Regression Analysis

	QP			IP			OR			ORG PER		
	β	R^2	F	β	R^2	F	β	R^2	F	β	R^2	F
TMC	0.51**	0.26	163.8**	0.44**	0.19	111.1**	0.51**	0.32	221.5**	0.61**	0.37	257**
CF	0.20**	0.04	20.5**	0.53**	0.28	180.5**	0.55**	0.3	200.8**	0.61**	0.37	257**
QPM	0.37**	0.14	76.1**	0.65**	0.42	334.8**	0.55**	0.31	203**	0.61**	0.37	257**
CI	0.36**	0.13	68.1**	0.55**	0.31	203.7**	0.56**	0.31	206.4**	0.61**	0.37	257**
TQM	0.44**	0.19	110.6**	0.5	0.25	156.3**	0.57**	0.32	218.6**	0.61**	0.37	257**

p<0.01). There was a significant positive correlation between continuous improvement and organizational performance (r= 0.67, p< 0.01), innovation performance (r=0.55, p<0.01) and operating performance (r= 0.56, p<0.01).

Research Questions 2: What might be the strength of association between elements of TQM and indicators of organizational performance?

The multiple regression results as presented in Table-III indicates that TQM significantly predicted the organizational performance (F=545.2, p<0.01).The regression results explain that TQM has 54% variance in organizational performance (R^2=0.54).The results further demonstrate that for one unit increase in the TQM, the organizational performance will increase by 0.73 units (β = 0.73, p<0.01).

TMC, which is an element of TQM significantly predicted the organizational performance (F=275, p<0.01). TMC explains 37% variance in organizational performance (R^2=0.37) and for one unit increase in TMC, organizational performance will increase by 0.61 units (β = 0.61, p<0.01).CF is an element of TQM, which is significantly predicted the organizational performance (F=343.7, p<0.01). Further, CF explains 43% variance in organizational performance (R^2=0.43) and for one unit increase in CF, organizational performance will increase by 0.65 units (β = 0.65, p<0.01). QPM is another element of TQM shows a significant predictive ability towards the organizational performance (F=576.7, p<0.01). QPM explains 68% variance in organizational performance (R^2=0.68) and organizational performance will increase by 0.82 units with the increase of one unit QPM (β = 0.82, p<0.01). CI is yet another element of TQM, which shows significant predictive ability towards the organizational performance (F=373.1, p<0.01). CI explains 45% variance in organizational performance (R^2=0.45) and for one unit increase in CI, organizational performance will increase by 0.67 units (β = 0.67, p<0.01).

TQM significantly predicted quality performance (F=110.6, p<0.01).TQM explains 19% variance in organizational performance (R^2=0.19) and for one unit increase in TQM, organizational performance will increase by 0.44 units (β = 0.44, p<0.01).Further, TQM has significant predictive ability towards innovation performance (F=156.3, p<0.01). TQM explains 25% variance in organizational performance (R^2=0.25) and for one unit increase in TQM, organizational performance will increase by 0.50 units (β = 0.50, p<0.01). In addition, TQM significantly predicted operating performance (F=218.6, p<0.01).TQM explains 32% variance in organizational performance (R^2=0.32) and for one unit increase in TQM, organizational performance will increase by 0.57 units (β = 0.57, p<0.01).

Findings And Discussion

The correlation coefficients reported a positive and significant association among elements of TQM and indicators of organizational performance. Further, the elements of TQM have significant predictive ability towards all the indicators of organizational performance. TMC predicted organizational performance and indicators of organizational performance namely, quality performance, innovation performance and operating performance. CF and QPM predicted organizational performance, quality performance, innovation performance and operating performance. CI predicted organizational performance and other indicators of organizational performance namely, quality performance, innovation performance and operating performance. Majority of the previous literature focused on TMC, CF and CI, whereas very less emphasis was given on QPM. Quality processes and quality management are the basic tools for the enhancement of quality and reduction in costs. The present study tried to study four elements of TQM and their impact on organizational performance, which include QPM. The study revealed that quality processes and quality management are also equally important in enhancing the performance of the organizations. Hence manufacturing organizations will have persistently struggle hard in improving their quality processes and quality management system, so that they can meet or exceed customer expectations thereby improve organizational performance.

This study tried to explore the role of TQM in improving organizational performance. The study found that the scales used to measure TQM and organizational performance has adequate reliability and inter-correlations amongst their subscales. It indicates that the scales were well matched with manufacturing organizations in Indian context. The current study showed that TQM is related to organizational performance. It interprets that effective implementation of TQM practices result into improved organizational performance. The study also examined that TQM is associated with all the indicators of organizational performance namely, quality performance, innovative performance and operating performance. It indicates that, the manufacturing organizations having TQM practices are superior in terms of quality, innovation and operations. This will help the organizations to produce the products as per the requirements of the customers with the superior quality and least cost.

TQM helps the manufacturing organizations in understanding quality, innovation and operations related problems. It indicates that TQM enhances the process of operations product and product quality, which eventually enhances customer relationships.

The previous studies found that, only one element of TQM that is Top Management Commitment was related to organizational performance (Shih & Gurnani, 1997). In addition, it was also found that the individual element of TQM found to contribute most to business performance was Customer Focus (MiléTerziovski et al, 2003). The present study investigated a high positive association between elements of TQM and indicators of organizational performance. All the elements of TQM namely, TMC, CF, QPM and CI reported a high positive correlation with the organizational performance. It indicates that leadership, customer focus, quality management and continuous improvement being the foremost in the process of contributing towards organizational performance.

Regression analysis revealed that TQM significantly predicted organizational performance and three indicators of organizational performance namely, quality performance, innovation performance and operating performance. TMC and CF both the elements of TQM significantly predicted organizational performance and its indicators. QPM and CI also significantly predicted organizational performance and its subscales namely, quality performance, innovation performance and operating performance. The results demonstrate that the manufacturing organization's perception about TMC, CF, QPM and CI contributes towards improvement in quality performance, innovation performance, operating performance and overall improvement in organizational performance. TQM is the better predictor of customer satisfaction. Manufacturing organizations with high understanding of TQM can focus better on innovation and designing the product, produce quality products with least cost and ensure customer satisfaction.

Conclusion

This study provides an evidence for a positive relationship between TQM and organizational performance. The excellence in organizational performance can be achieved through enhancing quality competency and operating efficiency, which directly contribute towards the better results. TMC is an important element of TQM, without which achieving quality excellence is a dream true. The end objective of any manufacturing organization these days is customer delightedness, which can be attained only when business organizations are customer centric. It is the responsibility of the organizations to produce the products as per the requirements of the customers. An organization can produce quality product consistently only when QPM is in place. CI facilitates the organizations to incorporate changes in the existing product as per the expectations of customers. TQM as a tool, which is very much essential for every organization as it is the basic requirement in the international market. Therefore, manufacturing organizations need to emphases on elements such as leadership commitment, customer expectations, process approach, system's approach and continuous improvement with an objective to meet international standards. Therefore manufacturing organizations will have to consider expenditure on quality related aspects as an investment for the future and focus on implementing TQM practices.

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