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Impact of TQM Practices on Operational Performance of Firms in India - An Empirical Study

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A B S T R A C T

The present paper empirically tested the relation of TQM practices on operational performance in both service and manufacturing industries. Hence the study used 300 participants from 50 service and manufacturing industries in India. The data was collected from respondents by using survey method. The questionnaire was designed on the relation of TQM practices on operational performance. Questionnaire covers the following TQM factors namely leadership, process management, employee management, continuous improvement, and customer focus. These questionnaires were shared to 300 respondents and the collected data was tested by using various tests such as frequency tests, descriptive, SEM analysis, correlation, multiple regression analysis tests etc. The study results found that the operational performance views Leadership, Strategic and Planning, Customer Focus, Information and Analysis, People Management and Quality Performance are statistically significant in both kinds of industries. Hence the application of TQM practices in both service and manufacturing industries is necessary to maintain the quality of the work as well as enhance the competition level in

Introduction

Globally, leaders or managers in different organizations obtain satisfaction from satisfying the needs of customers which is the central philosophy of Total Quality Management (TQM) practices. TQM is a holistic approach for quality improvement in operational performance of organisation was a serious debate among various researchers and policy makers. Organisations, in general adopted TQM practices for ensuring the

organisation's entire operations to achieve competitive advantage. According to Lee *et al.*, (2013) as the increase in demand and product development, the more efficient and effective organizations were forced to improve their quality of product or services and operations. Numerous studies showed the positive relationship between from TQM practices with the operational performance

of the organisation. However, there is no clear idea about the TQM practices in more accurate to the operational performance of the organisation. Specifically, the industries such as service and manufacturing have obtained the growth in their good performance this is because of their quality. Moreover, these are all the industries that has great impact on the technological growth and accordingly this growth would impact the quality of entire operational performance of industries, hence the best practices are necessary to make the industrial products as more quality. Considering this, the present paper empirically tests the relation of TQM practices on operational performance of both service and manufacturing industries.

Literature review

Total Quality Management

Quality is a huge component of the management in keeping the clients fulfilled. The quality of service and products are essential in almost all sectors, especially in service and manufacturing industries. Quality management idea has discovered wonderful criticality in associations and establishments and has changed to contemporary management approach in present age levels in twofold essentialness in deciding a suitable structure for essential prerequisites. Along these lines, the vital point is to embed quality exchange in the basicscheme of outlining the structure of an association (Prajogo and Sohal, 2006). The logic of TQM advanced mainly in the last three decades, incorporated a format for accomplishment through client fulfillment. TQM is recognized as a source of development, preference, and authoritative society (Irani *et al.*, 2004). For instance, if the employee is supposed to be served low quality as a result, the client will be disappointed (Demirbag *et al.*, 2006). TQM

is a series of management practices relevant to the entire establishment and formatted to guarantee that the establishment continually fulfills or surpasses customer needs. Understanding this, some researchers conducted a study in the aspect of TQM practices for testing the effect on non-financial and financial performance. Such activities are role of the quality department, quality data and reporting, product service design, management leadership, employee relations, training, strategic planning, supplier quality management, process management, information technology and training, customer focus and people management (Claver and Tari, 2003; Demirbag *et al.*, 2006; Flynn *et al.*, 1995; Fotopoulos and Psomas, 2009; Kanji, 2002; Salaheldin, 2009; Turkyilmaz *et al.*, 2010; Yusof and Aspinwall, 2000).

The relationship between TQM activities and Operational performance

There are numerous studies in past carried out the research in context of TQM implementation support and challenges for organisational performance specifically in operational area in more peculiar to both developed and developing countries (Babaita *et al.*, 2011; Belay *et al.*, 2011; Idris, 2011; Irfan *et al.*, 2012; Jaafreh and Al-abedallat, 2012; Munizu, 2013). For instance, developed countries like Turkey study of Sadikoglu and Zehir (2010) examined the associations between TQM approaches and various functional dimensions and to scrutinize the arbitrating impacts of employee functioning and modernization on the correlation between TQM methods and organisation functioning. The research utilized a cross-sectional survey technique by survey questionnaire was sent to 500 ISO 9001:2000 approved companies chosen at random, in various sectors in the Marmara area in

Turkey in 2005 and 2006 and 373 functional questionnaires were collected. Findings of the research suggested that employee functioning and modernization are arbitrarily related to TQM approaches and company functioning.

In Spain, a study by De Cerio (2003) determined the association between the operational performance and implementation level of quality management practices in 50 Spain manufacturing sector. Hence study used survey method and carried out multiple regression analysis. The study result found out the association of quality management practices and operational performance.

While, developing countries like Tunisia, the relationship that exists between the quality management practices and their impact on performance was explored by Lakhal *et al.*, (2006). Hence the study collected data from 133 Tunisia based companies. Their study is taken three critical quality management practices such as core, infrastructural and management. The results revealed that a positive relationship exists between organizational performance and quality management practices.

In Qatar, the study of Salaheldin (2009) examined whether TQM practices helped the growth of SMEs. Further this study analysed the critical success factors in the implementation of TQM in order to assess the operational performance and organizational performance. Hence, the study used the designed questionnaire, and it was distributed to 297 SMEs. The key findings found out such as substantial positive effect shown by the TQM implementation on both the operational and organizational performance. The results confirmed the significant relationship exists

between the operational and organizational performance in SMEs.

In India, study like Seth and Tripathi (2005) studied TQM by itself; TPM by itself; both TQM and TPM in combination. Experimental study based on a survey, with a sample size of 108 production firms was done. The study recognized two groups of features that were vital for efficient execution of TQM as well as TPM: commonly essential features for every one of the methods like leadership, procedural management and strategic planning; and method-specific features like tool management and emphasis on customer contentment.

Nair (2006) examined the influence of TQM methods on functioning of a perfect background for concept expansion and improvement using meta-analysis methods. Firstly, the study approves functional inferences of accepting Quality Management practices and put forward a theorized association between QM methods and functioning. Secondly, the meta-analysis of association technique is employed to investigate the experimental study in Quality Management to decide the Quality Management method that is constructively connected to enhance functioning. The findings showed several theorized associations and ascertained the existence of arbitrating features in most Quality Management practices such as functioning relationships improving operational performance.

A comprehensive assessment framework was suggested by Shrivastava *et al.* (2006) after examining the need for establishing the linkages between the factors which affect TQM correlated with operational performance. The authors have designed a diagnostic instrument for testing in Indian

industries which have implemented the TQM in the past decade. With the results from the analyzed data, a high, as well as weak linkage, is established which helps to improve the TQM, which is customized as per Indian scenario. This study contributed in providing feedback for managing as well as improving the TQM programs for efficient organizational performance.

It can hence be concluded here that globally and national level, many studies evaluated the effect of TQM on organisational performance, of which all have proved that TQM is useful. The drawback, however, is that it speaks of these effects only on the organisation but does not segregate into the top, middle or lower levels of the organisation.

Research design

Data collection

The data has been collected by using primary data collection. In primary data collection, the study used survey type of data collection among 300 participants from 50 service and manufacturing industries in India. The questionnaire might be simple to implement; however, the result of the process is likely to be more efficient (Zikmund, 2003). The sole purpose of the research is to identify the relation of TQM practices on operational performance of Indian manufacturing and service firms. Hence the questionnaire was prepared to attain the objectives.

Measures

The survey questionnaire consists of closed-ended questions. In order to determine the research framework, it requires generating questions involving age, occupation, and gender to achieve the prime objective in the

quantitative component involving the questionnaire approach. In this survey, multiple TQM factors are generated such as leadership, process management, employee management, continuous improvement, and customer focus. 5-point Likert scale is included in the questionnaire to convey the attributes of the participants effectively towards the organization. The respondents require answering the Likert Scale questions through a range of solutions, which begins with Strongly Agree to conclude at Strongly Disagree. As per the suggestion of Hewitt-Dundas (2004), there are chances of accruing benefits in the questionnaire approach through adopting the Likert Scale, due to the potential to make a difference among various levels of attitudes. After data collection, a pilot study was done. Once the pilot analysis was completed, the main study was carried out.

Data analysis

Table 1 shows the mean comparison between manufacturing and service industries based on the factors of TQM practices. From the significance value ($p > 0.05$), there is no statistically significant difference between these two industries based on the response in relation to TQM practices. In addition, all these factors have the mean value (> 3.5) around 4. It indicates that majority of the respondents are agreed all the dimensions of TQM practices.

Table 2 shows the mean comparison between manufacturing and service industries based on the factor of operational performance. From the significance value ($p > 0.05$), there is no statistically significant difference between these two industries based on the response about operational performance. In addition, these factors have the mean value (> 3.5) around 4. It indicates

that majority of the respondents are agreed with operational performance.

Table 3 presents the correlation analysis between the dimensions of TQM practices, quality performance, operational performance and business performance. Overall all these factors are a positively linear relationship with each other. This means that as one variable increase in value, and then another variable also increases in value. The amount of relationship value ranges from 0.322 to 0.993.

Table 4 reveals the multiple regression analysis. In the manufacturing industry, the beta coefficient of the regression of operational performance on leadership (beta=0.990, $t=47.127$, $p<0.001$) and Information and Analysis (beta=0.025, $t=2.144$, $p<0.05$) is statistically significant. Since the significance is less than the alpha of 0.05 values, the null hypothesis is accepted and hence there is a support of the hypothesis. Independent variables together accounted for 99% of the variance (R square) which indicates that operational performance is a more significant predictor of Leadership and Information and Analysis.

In the service industry, the beta coefficient of the regression of operational performance on leadership (beta=1.022, $t=71.595$, $p<0.001$) is statistically significant. Since the significance is less than the alpha of 0.05 values, the null hypothesis is accepted and hence there is a support of the hypothesis. Independent variables together accounted for 98% of the variance (R square) which indicates that operational performance is a more significant predictor of Leadership.

Table 5 presents the linear regression analysis. In the manufacturing industry, the beta coefficient of the regression of operational performance on quality performance (beta=0.898, $t=30.484$, $p<0.01$)

is statistically significant. Since the significance is less than the alpha of 0.05 values, the null hypothesis is accepted and hence there is a support of the hypothesis. Independent variables together accounted for 89% of the variance (R square) which indicates that operational performance is a more significant predictor of quality performance.

In the service industry, the beta coefficient of the regression of operational performance on quality performance (beta=0.807, $t=29.288$, $p<0.01$) is statistically significant. Since the significance is less than the alpha of 0.05 values, the null hypothesis is rejected and hence there is a support of the hypothesis. Independent variables together accounted for 82% of the variance (R square) which indicates that operational performance is a more significant predictor of quality performance.

Upon satisfaction of reliability and validity of individual constructs as well as the overall supply chain management practices model (Fig.1), the study proceeded to determine the fitness of the overall measurement model based on model fit indices generated as a part of AMOS output. Model fit is assessed on the basis of CMIN/df, P-value, Comparative Fit Index (CFI), Goodness of Fit Index (GFI), Adjusted Goodness of Fit Index (AGFI), Root Mean Square Error of Approximation (RMSEA) and P close. Model fit indices for supply chain management practices and product quality constructs were calculated, and the results have been indicated in Table 6.

Discussion and Conclusion

TQM is considered to be the quality oriented approach and effects on operational performance were viewed by various past

studies. The fundamental elements of TQM are given by the American Society for Quality Control are policy, planning, and administration; product design and design change control; control of purchased

material; production quality control; user contact and field performance; corrective action; and employee selection, training, and motivation (INC, 2015).

Table.1 Comparison between manufacturing and service industries based on the dimensions of TQM practices

Variables	Industry type		t-value	p-value
	Manufacturing	Service		
	Mean±SD			
Leadership	4.28±0.77	4.39±0.58	-1.470	0.143
Strategic and Planning	4.07±0.94	4.15±0.97	-0.675	0.500
Customer Focus	3.81±1.15	3.85±1.14	-0.269	0.788
Information and Analysis	3.64±1.23	3.71±1.28	-0.438	0.662
People Management	3.57±1.22	3.63±1.17	-0.365	0.715
Process Management	3.92±1.17	3.87±1.23	0.387	0.699

Table.2 Comparison between manufacturing and service industries based on the operational performance

Variables	Industry type		t-value	p-value
	Manufacturing	Service		
	Mean±SD			
Operational Performance	4.29±0.79	4.41±0.60	-1.454	0.147

Table.3 Correlation between the dimensions of TQM practices, Quality performance, Operational performance and Business performance

	V1	V2	V3	V4	V5	V6	V7	V8	V9
V1	1	.749**	.655**	.574**	.357**	.369**	.918**	.993**	.749**
V2		1	.767**	.637**	.369**	.387**	.791**	.753**	.970**
V3			1	.805**	.415**	.322**	.829**	.658**	.774**
V4				1	.556**	.456**	.688**	.582**	.696**
V5					1	.739**	.372**	.350**	.541**
V6						1	.343**	.367**	.505**
V7							1	.926**	.790**
V8								1	.750**
V9									1

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

Where V1= Leadership, V2= Strategic and Planning, V3= Customer Focus, V4= Information and Analysis, V5= People Management, V6= Process Management, V7= Quality Performance, V8= Operational Performance, V9= Business Performance.

Table.4 Association between dimensions of TQM practices and operational performance

Industry type		Unstandardized Coefficients		Adjusted R-square	F-change	t-value	p-value
		Beta	SE				
Manufacturing	(Constant)	-0.051	0.046	0.989	1689.938	-1.124	0.264
	Leadership	0.990	0.021			47.127	0.000**
	Strategic and Planning	0.026	0.018			1.417	0.159
	Customer Focus	-0.012	0.015			-0.786	0.433
	Information and Analysis	0.025	0.012			2.144	0.034*
	People Management	-0.021	0.012			-1.830	0.070
	Process Management	0.007	0.012			0.582	0.562
Service	(Constant)	-0.130	0.048	0.983	1741.684	-2.715	0.007
	Leadership	1.022	0.014			71.595	0.000**
	Strategic and Planning	0.008	0.011			0.791	0.430
	Customer Focus	-0.001	0.010			-0.079	0.937
	Information and Analysis	0.008	0.009			0.919	0.359
	People Management	-0.008	0.008			-1.037	0.301
	Process Management	0.004	0.007			0.542	0.589

Dependent Variable: Operational performance **p<0.01, *p<0.05

Table.5 Association between dimensions of quality performance and operational performance

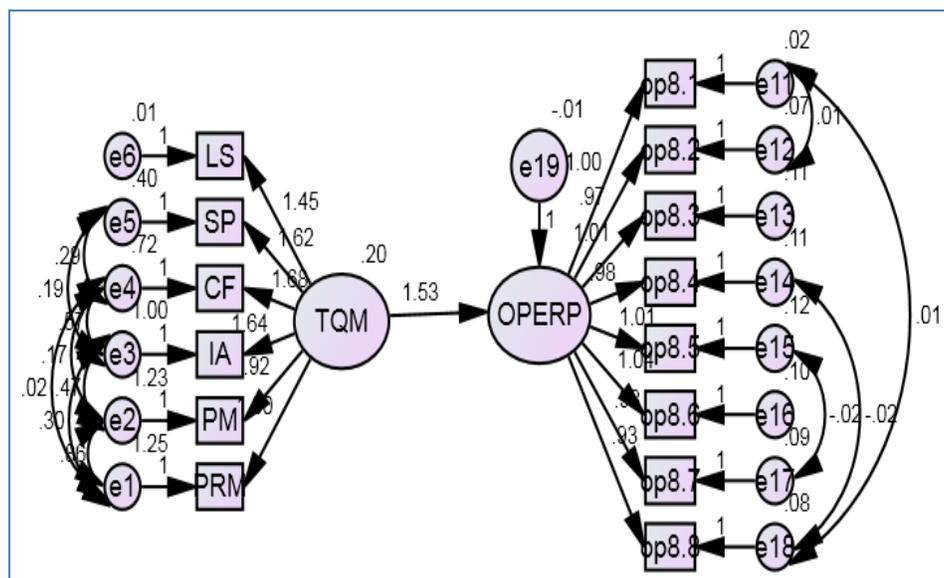
Industry type		Unstandardized Coefficients		Adjusted R-square	F-change	t-value	p-value
		Beta	SE				
Manufacturing	(Constant)	0.557	0.125	0.892	929.280	4.457	0.000
	Quality Performance	0.898	0.029			30.484	0.000**
Service	(Constant)	0.961	0.119	0.822	857.774	8.063	0.000
	Quality Performance	0.807	0.028			29.288	0.000**

Dependent Variable: Operational Performance**p<0.01.

Table.6 Model fit indices for full order model constructs of total quality management practices (TQM) and Quality performance

Variable	Value	Suggested value
Chi-square value	135.417	
Degrees of freedom (df)	64	
P value	0.000	P-value >0.05 (Hair <i>et al.</i> , 2006)
GFI	0.943	>0.90 (Hair <i>et al.</i> , 2006)
AGFI	0.906	> 0.90 (Daire <i>et al.</i> , 2008)
CFI	0.988	>0.90 (Hu and Bentler, 1999)
RMR	0.026	< 0.08 (Hair <i>et al.</i> , 2006)
RMSEA	0.061	< 0.08 (Hair <i>et al.</i> , 2006)

Fig.1 Second-order model (Operational Performance as dependent variable)



Studies of TQM practices are related to the performances of the manufacturing unit in general (Chenhall, 1997; Mann and Kehoe, 1994), and in regards, to quality was described by (Fuentes *et al.*, 2006; Lee *et al.*, 2003; Prajogo and Hong, 2008). In addition to this, some other elements determined by various authors with respect to employee satisfaction (Fuentes *et al.*, 2006; Sadikoglu and Zehir, 2010), novelty (Prajogo and Hong, 2008; Sadikoglu and Zehir, 2010; Santos-Vijande and Alvarez-Gonzalez, 2007), customer satisfaction (Choi and Eboch, 1998; Das *et al.*, 2000;

Fuentes *et al.*, 2006), competitive advantage (Agus and Sagir, 2001; Brah *et al.*, 2002), market share (Mohrman *et al.*, 1995), finance (Easton and Jarrell, 1998; Fuentes *et al.*, 2006; Tena *et al.*, 2001).

On the other hand, it supports the total performance of the firm (Brah *et al.*, 2002; De Cerio, 2003; Douglas and Judge, 2001; Kaynak, 2003; Sadikoglu and Zehir, 2010; Sharma, 2006). In this study, results reveals that the operational performance views Leadership, Strategic and Planning, Customer Focus, Information and Analysis,

People Management and Quality Performance are statistically significant. In line with several previous studies of Zhao *et al.* (2004), Lai and Cheng (2003) and Witt and Muhlemann (1994) found out the operational performance and effect of TQM practices in different sectors. In this view, the present study result applies to manufacturing and service sector. Likewise, Sila and Ebrahimpour (2005) showed the organisational performance in terms of implementing TQM practices based on the customer focus, leadership, process management, strategic planning, supplier management, people management and information and analysis. From the analysis and reviews of previous studies, it is observed that both management and service industries should consider the practices of TQM variables in enhancing product quality performance such as leadership, process management, customer focus, and strategic planning in product quality. There are numerous papers viewed the impact of TQM on reliability. However, there is not much literature on the relation of TQM on the performance and durability. Such research would help in developing a roadmap for the firms in implementing the performance and durability in different sectors also identify the possible pros and cons associated with it. Moreover, most of the previous literature focused the business and quality performance in manufacturing and service industries in India, to our knowledge, with respect to operational is restricted. Hence the study provides an excellent scope for future researchers.

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