



## Management Arts

*Elixir Mgmt. Arts* 46 (2012) 8567-8572

*Elixir*  
ISSN: 2229-712X

# Role of benchmarking in total quality management (case of Telecom services sector of Pakistan)

Faiza Sajjad and Shehla Amjad

COMSATS Institute of Information Technology, Abbottabad, Pakistan.

### ARTICLE INFO

#### Article history:

Received: 13 March 2012;

Received in revised form:

15 May 2012;

Accepted: 28 May 2012;

#### Keywords

Benchmarking,  
Total quality management;  
Quality outcomes/benefits;  
Pakistan;  
Telecommunication industry.

### ABSTRACT

The main purpose of this paper is to present the importance of benchmarking in TQM and organizational performance. To determine the various benefits an organization can derive from the application of total quality management practices, or the relationship between total quality management and quality outcomes/benefits in services sector of telecom industry of Pakistan. The study is based on primary and secondary data. Eight most important constructs were found through literature review for conceptual framework in this study. Primary data is collected through questionnaires. The same questionnaire was used in comparison of TQM practices in different countries such as India, USA, Mexico, China and Norway. The theoretical framework adopted is by Raghunathan et al. (1999). Findings revealed that TQM practices and implementation have positive effects on quality benefits or outcome (productivity, profitability, competitive position, reduce customer complaints, cost reduction, reduce rework level, reduces scrap level, stay in business) in services sector of telecom industry of Pakistan. Benchmarking also plays a significant role in the development of organizations. In addition to the research data, findings from different field studies and other research works have further supported conclusion drawn from this research, that TQM practices have positive effect on organizational development. The findings based on this empirical research would be useful to both decision makers and researchers.

© 2012 Elixir All rights reserved.

### Introduction

Benchmarking is an important strategic tool of total quality management (TQM). Benchmarking enhances transparency and performance after entering the public domain (Braadbaart, 2007). For the implementation of TQM factors within a corporations, according to Yusof and Aspinwall (2000), that one of the most influential factors in ensuring TQM adoption success was the formulation of a sound implementation framework prior to embarking on such a change process.

A benchmarking is classically seen as “a tool to improve organization’s performance and competitiveness in business life” (Kyro, 2003). Benchmarking should be a reference or measurement standard for comparison; a performance measurement that is the standard of excellence for a specific business; and a measurable, best-in-class achievement (Punniyamorthy and Murali, 2008). More than 40 definitions have been given to the term “benchmarking” (Wong and Wong, 2008). Benchmarking is a strategic tool for performance assessment and continuous improvement in performance (Lee et al., 2006),

Service benchmarking is made more difficult than benchmarking in manufacturing because it appears that the parameters that are important to the customers may differ significantly from one service industry to another (John and Eeckhout, 2006).

The roots of TQM can be traced from production quality control ideas early in 1920. Total quality management (TQM) was initially developed in Japan, and its origins can be traced in the work of the Juran (1989,) Deming (1986), Ishikawa (1985) Feigenbaum (1983) and Crosby (1979) and on the rise and

dominance of the Japanese automobile industry in the world markets.

TQM is a description of the attitude, behaviors and culture of the organization that aims to provide quality products and services to its customers and satisfy their need. The culture requires quality in all aspects of the organization’s operations, with things being done right the first time, and waste and defects eradicated from operations.

TQM is a management philosophy that seeks to integrate all organizational functions to focus on meeting customers’ needs and organizational objectives (Hashmi, 2000 & 2004).

Different researchers have different findings, related to effects of TQM practices and implementation. A number of researchers concluded that TQM implementation has effect on firm’s business performance, whereas others stated that it does not lead to improvements in firm’s business performance. According to Harnesk and Abrahamsson (2007), TQM has imbedded contradictions, for example manipulation versus empowerment, collectivism versus individualism and standardization versus innovating learning. But now a days mostly researcher emphasis on quality management programs for organizational development and getting maximum output in this competitive world. According to their point of views and findings, an effective model of success for companies is total quality management, which is customer centric set of management policies that deliver quality to maintain a sustainable competitive edge.

During the 1980s and 1990s, TQM was widely seen as a revolution in management and began to influence national business systems .TQM is often referred as a social movement in

Tele:

E-mail addresses: [faiza@ciit.net.pk](mailto:faiza@ciit.net.pk); [shehla@ciit.net.pk](mailto:shehla@ciit.net.pk)

© 2012 Elixir All rights reserved

the literature. (Hackman and Wageman, 1995). According to (Samir Baidoun, 2003) factors such as benchmarking. Top management commitment, leadership, people management, strategy, policy, partnership, management of processes and resource management are generally considered as the initial inputs to the implementation process of TQM

TQM can be defined as a holistic management philosophy aimed at continuous improvement in all functions of an organization and satisfied customer's need and requirements by providing quality services under the leadership of top management. (Demirbag et al., 2006).

According to (Jung-Lang-Cheng, 2008) TQM and benchmarking emphasize on product quality index along with follow up action for evaluation system, and TQM also emphasizes the correct action to reduce defect rates.

(Saravanan & Rao., 2007) studied that effective implementation of TQS, continuously increase quality and performance of an organization. According to (Sharma & Hoque, 2002; Kanji & Sa 2007) public sector organizations adopted and practiced TQM for continuous improvement.

In this study we have identified eight basic pillars of TQM through literature review and role of benchmarking in TQM and its impact on organizations.

- Benchmarking
- Top management commitment
- Strategic quality planning process
- Quality information and analysis
- HRD
- Quality assurance
- Customer focus and satisfaction
- Public responsibility

To promoting organizational commitment top management commitment will be helpful (Everett, 2002; Buch and River, 2002). In a global market the success of organization will depend on the abilities of quality leader or managers in terms of teamwork, knowledge, skills and problem solving. According to (Karia and Assari, 2006; Chang, 2006) in pursuit of continuous improvement TQM philosophy emphasizes the role of internal and external suppliers, involvement of employees and customers.

Performance methods and performance measures favored by TQM adopters are studied in eight domains: production, finance. Employee relations, market, quality of product and services, quality of suppliers' products and services, productivity and customer satisfaction.(V. Kumar, 2008). Different writers and Quality gurus strongly emphasize the importance of strategic planning process based on total quality (Deming, 1986; Oakland, 1993; James, 1996; Ahire *et al.*, 1996; Sinclair and Zairi, 2001; Dayton, 2001; Martinez-Lorente *et al.*, 1998; Sureshchandar *et al.*, 2001; Crepin, 2002; Hitchcock and Willard, 2002). Because strategic planning process for TQM always helpful for implementing and practicing TQM principles effectively. Dervitsiotis, (2000) states that it is noticeable that not only consulting firms but also organizations such as the American Productivity and Quality Centre, and the European Foundation for Quality Management are seriously engaged in the promotion of and training in benchmarking as a fundamental approach to achieve business excellence.

A large number of world economies are going toward on reform paths over the past decade. The global telecommunication market is dynamism and is widely attributed to rapid technological development. It witnessed significant

expansion of telecommunication networks and striking improvements in quality. However sudden growth in subscriber base in Pakistan has caused network congestion and service quality problems. Pakistan is still an unsaturated market and with falling cost of handsets there are large numbers of new subscribers to compete for, especially in the rural areas. But eventually, as in saturated markets, if mobile operators want to avoid simply competing on price, they will have to compete on superior service, innovative features and ease-of use. Mostly, telecommunication organizations in Pakistan just concentrate on marketing strategies and spend large amount of money on advertisement and marketing tools. Marketing strategies are useful but most important and sustainable factor for growth and profitability is practicing and managing quality programmed, providing quality services so TQM become important factor for innovation cost reduction or cost effectiveness and profitability in long run.

#### **Rationale**

In the present study the attempt has been made to assessing benefits and effectiveness of utilizing Total Quality Management (TQM) system and role of benchmarking in TQM. The research aims to know the various benefits an organization can derive from the utilization of total quality management and to identify the weak areas for TQM practices in telecom industry of Pakistan and try to improve them. Further also suggest that the results are quite generalist and they can be applied to the markets and telecommunication industry of other countries as well, particularly those which have same culture, traditions and values like India Bangladesh, Maldives, Sri-Lanka etc. To attain a firm grip over the market share many organizations in all over the world are making use of quality information and related systems to enhance quality of products and services.

#### **Objectives**

The main purpose of this research is:

- 1) To assess the effects of TQM factors on overall business performance in Services sector of Telecom industry of Pakistan.
- 3) To assess the significance of TQM variables or principles for organizational development

#### **Hypotheses**

In the light of above objectives the following hypotheses are:

**H1:** TQM principles help to enhance performance of an organization in services sector of telecom industry of Pakistan.

**H2:** The extent of use of benchmarking is significantly related to the quality

**H3:** Benchmarking also leads to customer satisfaction.

#### **Research Methodology**

In this study, the questionnaire survey was used to obtain information about TQM practices and overall business performance from different telecom companies in Pakistan (PTCL, Mobilink, Telenor, Warid, and U-phone). That data was used to examine the effects of TQM practices on the development and performance of these companies. The type of samples and the number of organizations were determined on the basis of meeting the information and requirements for the research. The survey instrument adopted in this research was a pre-tested questionnaire with some modifications that were suitable for this study. The theoretical framework by Raghunathan et al (1999) was adopted in this survey. The questionnaire was previously used in comparison of quality management practices in different countries such as the India, USA, Mexico, China, and Norway. The questionnaire consisted of 53 related questions in nine categories. These categories

correspond to the US Malcolm Baldrige National Quality Award (MBNQA) criteria, which has been used for the evaluation of quality management in many of US organizations (Pannirselvam et al., 1998).

There were 105 respondents and majority was related to top, middle management and supervisory level. The items were written in the form of statements to which the respondents responded using a five-point Likerts type scale (ranging from very high to very low). The research questionnaires were sent to human resource management department in the sampled organizations; because HRM department was dealing with these type of matters in these organizations not a quality management department directly.

A conceptual framework (depicted in figure 1) was designed to test the hypotheses. This framework consisted of eight independent and one dependent variables.

Dependent variable Y = Quality outcomes/benefits of organizations

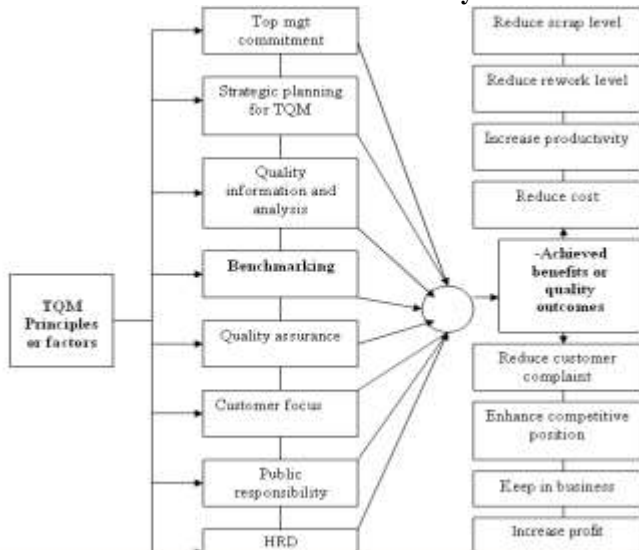
- Independent variables
- X1= Top management commitment
  - X2 Strategic quality planning process,
  - X3 Quality information and analysis,
  - X4 HRD,
  - X5 Quality assurances,
  - X6 Customer focus and satisfaction,
  - X7 Public responsibilities
  - X8 Benchmarking

The multiple regression equation estimated from sample data then took the following form

$$Y_i = a + b_1X_{1i} + b_2X_{2i} + \dots + b_kX_{ki}$$

Multiple regressions used to test the model were conducted using SPSS. Three statistical procedures were used to analyze the data, such as, descriptive statistics, Pearson product-moment correlation coefficients and multiple regressions. In this study descriptive statistics were used to check variables for the violation of normality distribution assumptions. The correlation matrix was calculated to determine the relationship between dependent and independent variables and to determine the multicollinearity is a problem for the model. A multiple regression analysis was used, to determine the effect of each independent variable on quality outputs / benefits or model. The conceptual framework depicted in Figure 1 is designed to guide the analysis presented in this study.

**Figure1. Conceptual Framework for TQM Practices and Benefit in Telecommunication Industry of Pakistan**



**Data Analysis and Results**

**Relationship between TQM principles and quality outcomes or benefits**

The relationship between total quality management (TQM)’s principles and quality outcomes of an organization was investigated using Pearson product-moment correlation coefficient. The theoretical model of TQM practices or implementation and overall business performance or development, incorporate three hypotheses was tested simultaneously.

In correlation analysis between TQM principles and quality outcomes or benefits. Strategic quality planning (r=0.361\*\*), HRD (r=.352\*\*), quality assurance (r=.449\*\*), customer satisfaction (r=.298\*\*) and benchmarking (r=.587\*\*) had positive and most effect on quality outcomes or benefits of organizations in telecom industry of Pakistan. These TQM factors play significant role into the development of telecom companies of Pakistan

Top management commitment (r=.145), quality information and analysis (r=.151), public responsibility (r=.215\*) had also positive but less effect on quality outcomes or benefits of telecom companies of Pakistan. Benchmarking and quality assurance had strong positive effect on business performance of the telecom companies of Pakistan and they play a significant role into the development of organization. This mean, that there are positive relationship between all TQM principles and quality benefits of the organizations. If TQM principles are implemented effectively more quality outcomes can be derived.

**Relationship between benchmarking and customer satisfaction**

There is strong positive relationship between benchmarking and customer satisfaction, (r=.534\*\*). This mean that benchmarking play a significant role in customer satisfaction, when companies will practice benchmarking than quality will be improve and innovation will occur and in this way customer will be more satisfied .

This study attempts to answer two questions; How well the eight measures of total quality management predict perceived quality benefits or outcomes and how much variance in perceived quality benefits scores can be explained by scores on these eight scales? Secondly which variable is the best predictor of perceived quality benefits? To explore these questions and test hypotheses; Standard multiple regression was considered an effective statistical technique for data analysis. Preliminary analyses were performed to ensure no violation of the assumptions of normality, linearity, and homoscedasticity

**Quality benefits perceived by TQM variables in model**

Model summary is presented in Table 2, R is called multiple correlation coefficient, measure the degree of relationship between a variable and its estimate from the regression equation. Model of this study shows that the R is .62, which mean, strong positive relationship between quality benefits and all TQM principles or practices.

According to (Tabachnick and Fidell, 2001) to provide a better estimate of the true population value the Adjusted R square statistics correct this value. If you have a small sample may wish to consider reporting this value, rather than the Normal R square value.

R square is called coefficient of multiple determination and lies between 0 and 1. This tells how much of the variance in the dependent variable (quality benefits) is explained by the model (which includes the variables of Total quality management). In

this study the value is .393. Expressed as a percentage (multiply by 100, by shifting the decimal point two places to the right), this means that this model explains 39.3 percent of the variance in quality benefits and outcomes.

Table 3; present ANOVA to assess the statistical significance of the result. This tests the null hypothesis that multiple R in the population equals 0.

The model in this study reaches statistical significance of .000, this really means  $p < .0005$ .

A Predictors: (Constant), Benchmarking, Top Mgt, Quality inform and analysis, Public responsibility, Strategic Quality planning, Quality Assurance, HRD, Customer Satisfaction

B Dependent Variable: Quality Outcomes or Benefits

### Role of Benchmarking in TQM model

The next thing in this research is the need to know which variables included in the model contributed more to the prediction of the dependent variable. That can be determined through the information given in Table 4, labeled regression coefficients.

In this study interest is in comparing the contribution of each independent variable, by analyzing beta values of standardized coefficients.

The largest beta coefficient is .471, which is for Benchmarking. This means that this variable makes the strongest contribution to explaining the dependent variable, when the variance explained by all other variables in the model is controlled for.

The Beta value for quality information and analysis is quite lower (-0.53), as compare to other variables. To determine the statistically significant unique contribution of each variable to the equation, will check the value in the column marked Sig. if the Sig value is less than .05(.01, .0001etc) then the variable is making a significant unique contribution to the prediction of the dependent variable. If greater than .05 then can conclude that variable is not making a significant unique contribution to the prediction of dependent variable. This may be due to overlap with other independent variables in the model. In this case, benchmarking (.000) make a unique, and statistically significant, contribution to the prediction of perceived quality benefits. Strategic quality planning is also make a unique and statistically significant, contribution to the prediction of perceived quality benefits, at some extent, because its Sig value is 0.057.

A Dependent Variable: Quality Outcomes or Benefits

The results of the analyses presented above allow us to answer the two questions posed at the beginning of this study.

Model of this study, which includes, top management commitment, strategic quality planning, quality information and analysis, HRD, quality assurance, customer satisfaction, public responsibility, benchmarking, explains 39.3 percent of the variance in perceived quality benefits (Question 1) and of these eight variables, benchmarking makes the largest contribution (beta=.471), although strategic quality planning process also made a statistically significant contribution (beta= .174) (Question 2)

### Conclusion

Before discussing the results obtained by the research methodology adopted. It is necessary to evaluate this study in the context of its limitation. First, data used to test the theoretical models came from five telecom service companies. So generalization is limited.

Second, the measure of top management commitment perceived is relatively weak, because it asked respondents for

their general perception of top management commitment in their respective organization.

Third, all primary data were obtained from respondents through questionnaire. Response was on their perceptions, thus research findings might have been biased. However these limitations in the study leave future ground for explorations and research on the subject.

The result obtained from the questionnaire survey, which have a number of practical implications. All three hypotheses were confirmed by the data. First, TQM practices or implementation has positive effects on quality benefits for overall business performance. Second, benchmarking is the decisive factor in determining the success of organizational overall business performance. Third, the research findings can imply that it is not necessary for all TQM factors to be present to be ensuring the success of the TQM programs and overall business performance, like top management commitment was too low in this finding. Mean there was less impact of top management commitment on quality benefits as compare to other variables or factors in telecom companies of Pakistan. In other words, even if a few elements are not present, it is still possible to obtain the required level of overall business performance. This does not mean that these elements are useless and have no value; instead organizations should identify the problem areas of these elements and implement them more effectively.

Investing in TQM practices and implementation often requires a long term effort and a great deal of energy, money, patience and management attention. Although this study is conducted for telecom industry of Pakistan, organizations in other countries can also use it as reference, since the existing quality management knowledge was used to develop conceptual frame work. Therefore, many principles and practices presented in this study can be used for organizations in other countries. The fact is that the basic philosophy of TQM is applicable to any type of organization. Some principles and practices presented in the study are important and key to the success of any organization.

Finally, it was concluded that the TQM implementation and practices framework or model developed in this study is applicable in practice and can describe how to improve their implementation and practices efforts. For organizations that are planning TQM, the conceptual framework in this study provides detailed information on the elements and practices of TQM and indicators of overall business performance. Study can provide specific benefits of a number of TQM practices for organizations that have not decided whether to implement TQM, and positively encouraging them in implementing TQM.

Since this study was conducted in Pakistan when almost the entire market had adopted itself to globalization it will not be surprise to suggest that the research findings have global applicability apart from being of use to the academics and business environment of Pakistan.

### References

- Ahire, S.L., Golhar, D.Y., Waller, M.A. (1996). Development and validation of TQM implementation constructs. *Decision Sciences*, Vol. 27, pp. 23-56.
- Braadbaart, O. (2007), "Collaborative benchmarking, transparency and performance evidence from the Netherlands water supply industry", *Benchmarking: An International Journal*, Vol. 12 No. 6, pp. 677-92.

- Buch, K. and Rivers, D. (2002). Sustaining a quality initiative. *Strategic Direction*, Vol. 18 No. 4, pp. 15-17.
- Chang, H.H. (2006), "Development of performance measurement systems in quality management organizations", *The Service Industries Journal*, Vol. 26 No. 7, pp. 765-86.
- Crepin, D. (2002). From design to action: developing a corporate strategy. *Quality Progress*, Vol. 35 No. 2, pp. 49-56.]
- Crosby, P. (1989). *Let's Talk Quality: 96 Questions You Always Wanted to Ask Phil Crosby*, McGraw-Hill, New York
- Crosby, P.B. (1979). *Quality Is Free*. McGraw-Hill, Inc., New York.
- Crosby, P.B. (1980). *Quality is Free: The Art of Making Quality Certain*, Penguin, and New York, NY.
- Dayton, N.A. (2001). Total quality management critical success factors, a comparison: the UK versus the USA. *Total Quality Management*, Vol. 12 No. 3, pp. 293-8.
- Deming Prize (1996). *Guide for Overseas Companies*. Union of Japanese Scientists and Engineers, Tokyo, Japan.
- Deming, W.E. (1986). *Out of Crisis*. Massachusetts Institute of Technology, Center for Advanced Engineering Study, Cambridge, MA.
- Demirbag, M., Tatoglu, E., Tekinkus, M. and Zaim, S. (2006). An analysis of the relationship between TQM implementation and organizational performance. *Journal of Manufacturing Technology Management*, Vol. 17 No. 6, pp. 829-47.
- Dervitsiotis, K.N. (2000). Benchmarking and business paradigm shifts. *Total Quality Management*, Vol. 11 No. 4/5/6, pp. 641-6.
- Everett, C. (2002). Penn states commitment to quality improvement. *Quality Progress*, Vol. 35 No. 1, pp. 44-9.
- Feigenbaum, A. (2002). The power behind consumer buying and productivity. *Quality Progress*, Vol. 35 No. 4, pp. 49-50.
- Feigenbaum, A.V. (1991). *Total Quality Control*. Third edition, McGraw-Hill, Inc., New York.
- Fleisher, C.S. and Nickel, J.R. (1994), "Analyzing the TQM adoption experiences within a corporate staff unit: a progress learning model", *Total Quality Management*, Vol. 5 No. 3, pp. 77-92.
- Hackman, J.R., Wageman, R. (1995), Total quality management: empirical, conceptual, and practical issues. *Administrative Science Quarterly*, Vol. 40, No. June, pp. 309-42.
- Harnesk and Abrahamsson. (2007). TQM: an act of balance between contradictions. *The TQM Magazine*, Vol. 19 No. 6, pp. 531-540.
- Hashmi, K. (2004). Introduction and implementation of total quality management (TQM). Available at: [www.isixsigma.com/library/content/c031008a.asp](http://www.isixsigma.com/library/content/c031008a.asp) (accessed March 3, 2008).
- Hitchcock, D. and Willard, M. (2002). Sustainability; enlarging quality mission. *Quality Progress*, vol. 35, no. 2, pp. 43-
- Ishikawa, K. (1985). *What is Total Quality Control? The Japanese Way*. Prentice-Hall, London.
- James, P. (1996). *Total Quality Management. An Introductory Text*, Prentice-Hall, Englewood Cliffs, NJ.
- John, L.K. and Eeckhout, L. (2006), "Performance evaluation and benchmarking", *Benchmarking: An International Journal*, Vol. 13 No. 5, pp. 629-31.
- Jung-Lang-Cheng, (2008). Implementing six sigma via TQM improvement: an empirical study in Taiwan. *The TQM Journal*. Vol. 20, no. 3, pp. 182-196.
- Juran, J.M. (1993). Made in USA: a renaissance in quality. *Harvard Business Review*, Vol. 71 No. 4, pp. 42-50.
- Juran, J.M. and Gryna, F.M. (Eds) (1988). *Quality Control Handbook, 4th ed.*, McGraw-Hill, New York, NY.
- Kanji, G. and Sa', P. (2007). Performance measurement and business excellence: the reinforcing link for the public sector. *Total Quality Management & Business Excellence*, Vol. 18 No 1-2, pp. 49-56.
- Karia, N. and Asaari, M.H.A.H. (2006), "The effects of total quality management practices on employees' work-related attitudes", *The TQM Magazine*, Vol. 18 No. 1, pp. 30-43.
- Kyro, P. (2003), "Revising the concept and forms of benchmarking", *Benchmarking: An International Journal*, Vol. 10 No. 3, pp. 210-25.
- Lee, Y.P., Zailani, S. and Soh, K.L. (2006), "Understanding factors for benchmarking adoption: new evidence from Malaysia", *Benchmarking: An International Journal*, Vol. 13 No. 5, pp. 548-65.
- Martinez-Lorente, A., Dewhurst, F. and Dale, B. (1998). Total quality management: origins and evolution of the term. *The TQM Magazine*, Vol. 10 No. 6, pp. 378-386.
- Oakland, J. (2000). *Total Quality Management ± Text with Cases*. 2nd ed., Butterworth Heinemann, Oxford.
- Punniyamorthy, M. and Murali, M.R. (2008), "Balanced score for the balanced scorecard: a benchmarking tool", *Benchmarking: An International Journal*, Vol. 15 No. 4, pp. 420-43.
- Rao, S., Solis, L. and Raghunathan, T. (1999). A framework for international quality management research: development and validation of a measurement instrument. *Total Quality management*, Vol. 10 No. 7, pp. 1047-75.
- Samir, B. (2003). Empirical study of critical factors of TQM in Palestinian organizations. *Logistics Information Management*, Vol. 16, NO. 2, pp. 156-171
- Saravanan and Rao. (2007). The impact of total quality service age on quality and operational performance: an empirical study. *The TQM Magazine* Vol. 19 No. 3, pp. 197-205.
- Sharma, U. and Hoque, Z. (2002). TQM implementation in a public sector entity in Fiji: public sector reform, commercialization, and institutionalism. *The International Journal of Public Sector Management*, Vol. 15 No. 5, pp. 340-60.
- Sinclair, D. and Zairi, M. (2001). An empirical study of key elements of total quality-based performance measurement systems: a case study approach in service industry. *Total Quality Management*, Vol. 12 No. 4, pp. 535-50.
- Sureshchandar, G.S., Chandrasekharan Rajendran and Anantharaman (2001). A conceptual model for total quality management in service organizations. *Total Quality Management*, Vol. 12 No. 3, pp. 343-63.
- V. kumar. D.de Gosbois, F.Choisne and U.Kumar. (2008). Performance measurement by TQM adopters. *The TQM Journal*. Vol. 20 No. 3, pp. 209-222
- Yusof, S.M. and Aspinwall, E. (2000), "Total quality management implementation frameworks: comparison and review", *Total Quality Management*, Vol. 11 No. 3, pp. 281-95.

**Table 1: Correlation between TQM principles and quality outcomes or benefits**

	Quality outcomes/benefits	TopMgt commitment	Strategic quality planning	Quality information & analysis	HRD	Quality Assurance	Customer Satisfaction	Public responsibility	Benchmarking
Quality Outcomes or Benefits	1								
Top Mgt commitment	.145	1							
Strategic Quality planning	.361(**)	.302(**)	1						
Quality information & analysis	.151	.165	.222(*)	1					
HRD	.352(**)	.175	.269(**)	.380(**)	1				
Quality Assurance	.449(**)	.171	.254(**)	.153	.513(**)	1			
Customer Satisfaction	.298(**)	.498(**)	.183	.263(**)	.436(**)	.459(**)	1		
Public responsibility	.215(*)	.324(**)	.216(*)	.081	.268(**)	.271(**)	.452(**)	1	
Benchmarking	.587(**)	.253(**)	.362(**)	.323(**)	.541(**)	.561(**)	.534(**)	.336(**)	1

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

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

**Table 2: Model Summary**

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.627 <sup>(a)</sup>	.393	.342	8.18551

**Table 3: ANOVA**

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	4165.022	8	520.628	7.770	.000 <sup>(a)</sup>
	Residual	6432.240	96	67.002		
	Total	10597.262	104			

**Table 4: Regression Coefficients**

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	28.604	9.809		2.916	.004
	Top Mgt commitment	-.034	.108	-.030	-.316	.753
	Strategic Quality planning	.170	.088	.174	1.927	.057
	Quality information and analysis	-.057	.097	-.053	-.592	.555
	HRD	.004	.097	.005	.046	.963
	Quality Assurance	.139	.087	.167	1.607	.111
	Customer Satisfaction	-.040	.130	-.035	-.309	.758
	Public responsibility	.002	.063	.002	.026	.979
	Benchmarking	.439	.105	.471	4.177	.000