

# Impact of TQM Practices on Firm's Performance of Pakistan's Manufacturing Organizations

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## Abstract

This empirical study examines the association between total quality management (TQM) practices and performance, i.e. quality, business, and organizational performance. The quantitative data were obtained through a survey from 171 quality managers of Pakistan's manufacturing industry. This study supports the hypothesis that TQM practices positively impact the performance. TQM tools and techniques (Incentive and Recognition System, Process, Monitoring and Control and Continuous Improvement) and Behavioral factors (Fact based-management, top management's commitment to quality, employee involvement and customer focus) contribute to the successful implementation of TQM. The study reports that successful adoption and implementation of TQM practices results in improving the performance of organization. The main implication of the findings for managers is that with TQM practices, manufacturing organizations are more likely to achieve better performance in customer satisfaction, employee relations, quality and business performance than without TQM practices.

**Keywords:** Total quality management, quality performance, business performance, organizational performance, manufacturing firms, Pakistan.

## Introduction

During the last three decades, Total Quality Management (TQM) has been receiving far-flung acceptance by the diverse sectors of the economy such as manufacturing (Fotopoulos and Psomas, 2009), service (Feng et al., 2008), government (Chen, 2005), health care (Kaplan et al., 2010), banking (Irfan et al., 2009) and education (Faganel, 2010; Manivannan and Premila, 2011). This TQM phenomenon is wide-reaching. Noronha (2002) provided that perhaps few

would disagree that no other management issue since Frederick Taylor's Scientific Management at the beginning of the century has created such a profound impact as what the TQM movement has achieved (Ross, 1993). Kanji (1990) has even put TQM as bringing about a second industrial revolution (cited in Noronha, 2002). The continuous publication of TQM-linked papers in prominent journals such as *Academy of Management Review* (Benner and Tushman, 2003), *Management Decision* (Ehigie and McAndrew, 2005), *Journal of Operations Management* (Zu et al., 2008), *International Journal of Management Reviews* (Molina-Azorín et al., 2009), and *Total Quality Management* (Hoang et al., 2010; Lam et al., 2008) confirms that any assertion that TQM is just one more managerial fad is not fully justified.

Although continuous attention given to TQM in industrialized countries including USA, Japan, UK and other European countries, however, it is only during last ten years that researchers have started to scrutinize quality practices in developing countries (Temtime, 2003; Hoang et al., 2006; Das et al., 2008; Khanna et al., 2010; Satish and Srinivasan, 2010; Al-Swidi and Mahmood, 2012). This is mainly due to the fact that developing countries are breaking the conventional trade barriers, opening their markets to international opponents and starting to see dramatic improvements in quality. Now the demand for quality can no longer be the privilege of the developed world. At Pakistan's first international convention on quality, Crosby (1995) asserted that quality plays a vital role for the economic survival of the developing nations (Temtime and Solomon, 2002). Recently with the same theme of '*Quality, Competitiveness and Performance*' at Pakistan's 12th International Convention on Quality Improvement (ICQI'2011), Gregory Watson President of International Academy for Quality stressed the need for the effective development of TQM programs to save 500 billion rupees being lost annually by organizations due to poor quality of manufacturing and service delivery operations (<http://www.meqa.org>). Therefore, Government of Pakistan in 2011 has launched Prime Minister Quality Award, in which professional assessments will be carried out based on TQM standard similar to international state sponsored norm for Performance Excellence. Moreover, Pakistani Government has formulated National Industrial Policy, implementation framework, 2011 with the vision to turn Pakistan into a factory for the world rather than a shop with prime objective will be the growth of competitiveness, and value addition by radical increase in Pakistan's manufacturing value addition by more than 100% (<http://www.moip.gov.pk>). TQM, for that reason is a solution for improving the quality of products in Pakistani economy so that they are acceptable in a global market, and as a result, the overall effectiveness and performance of Pakistani manufacturing sector can be improved.

When looking at the relationship between TQM practices and firm performance within Pakistani context, although most of the recent studies shows the positive relationship between TQM practices and firm performance in manufacturing (Awan and Bhatti, 2003; Awan et al., 2009; Malik et al., 2010; Raja et al., 2011; Saleem et al., 2011), and service sector (Vakani et al., 2009; Khan, 2010; Quraishi et al., 2010; Khurram and Jafri, 2011; Sajjad and Amjad, 2011); however, these studies generally lack statistical and methodological rigor as the researchers acknowledge the relatively small and non representative sample size employed. Therefore, it is unclear if the findings of these studies are appropriate to Pakistan. This leads to the following research questions of this study:

1. Do TQM practices affect the quality performance of Pakistan's manufacturing firms in terms of improved products and services quality, process and productivity, and reduced errors/defects in Pakistani Manufacturing sector?
2. Do TQM practices affect the business performance in terms of profitability, market share and total sales in Pakistani Manufacturing sector?
3. Do TQM practices affect the organizational performance in terms of improvement in employees' attitude towards quality, improvement of the flow of information among departments, reduction in absenteeism, reduction in tardiness rate, improvement in skill's level in Pakistani Manufacturing sector?
4. Does the extent of TQM adoption varies as per industry type, company size and assets possession in Pakistani Manufacturing sector?

Therefore, this paper aims to empirically examine the relationship between TQM practices and performance in various manufacturing industrial sectors of Pakistan such as Textile, Fertilizers, Pesticides, FMCG, Chemicals, Electronics, Pharmaceuticals, Paper & Board, Footwear, Accessories, Plastic, Rice, Wheat and Sugar mills. Specifically, this study seek to scrutinize the extent to which TQM practices and performance is correlated and how TQM practices affects various levels of performance (quality, business and organizational performance) in manufacturing industry of Pakistan. This study further adds to TQM literature by presenting empirical data on the TQM strategies that work in the Pakistan and how TQM can be utilized to be a source of competitive advantage.

## **Literature Review**

The theory of quality management has been developed from three different areas: First, contributions from quality leaders (Crosby, 1979, 1995; Deming, 1982, 1986; Feigenbaum, 1951, 1961, 1991; Ishikawa, 1985; Juran, 1951, 1962, 1974, 1988, 1989, 1992), Second, formal quality award models (Malcolm Baldrige National Quality Award-MBNQA-; European Quality Award-EQA-; The Deming Prize; Kanji Business Excellence Model) and third, measurement studies (Saraph et al., 1989; Flynn et al., 1994; Ahire et al., 1996; Rahman, 2001; Brah et al., 2002; Prajogo and Sohal, 2003; Talavera, 2004; Sila, 2005; Prajogo, 2005; Tari et al., 2006; Brah and Lim, 2006; Karuppusami & Gandhinathan, 2006; Demirbag, 2006; Sila, 2007; Ou et al., 2007; Fryer et al., 2007; acinati, 2008; Ya'acob, 2008; Al-khalifa et al., 2008; Salaheldin, 2009; Satish & Srinivasan, 2010; Malik & Khan, 2011; Arumugam & Mojtahedzadeh, 2011; Zehir et al., 2012). This theory of quality management has recognized many TQM practices. Such TQM practices have been documented and empirically analyzed in measurement studies (see Table I) and in studies that have investigated the relationship between TQM practices and performance (see Table II). Based on this literature review, this study suggests the hypotheses proposed (see section 2.2 to 2.4) and the research model shown in Fig. 1.

## **TQM Practices**

The TQM practices identified in measurement studies carried out around the world in recent years have been summarized in Table I. For the sake of conciseness, we have selected only to

include a selection of the most relevant studies from the past 12 years. Saraph et al. (1989) proposed Seventy eight items that were grouped in to eight critical TQM practices: *1)role of divisional top management and quality policy, 2)process management, 3)product and service design, 4)training, 5)quality data and reporting, 6)supplier quality management , 7)role of the quality department and 8)employee relations*. To measure quality management, Lu & Sohal (1993) used nine TQM practices:*1)Top management commitment, 2)Strategic quality management, 3)Process quality management, 4)Design quality management, 5)Education and Training, 6)Information and Analysis, 7)Benchmarking, 8)Resources and 9)Statistical process control*). In the same way, Flynn et al. (1994) proposed seven quality practices of TQM:*1)top management support, 2)product design, 3)process management, 4)quality information, , 5)supplier involvement, 6) workforce management and 7)customer involvement*. This instrument is closely resembled to the preceding instrument developed by Saraph et al. (1989). Powell (1995) comprehended the dimensions of quality management and identified 12 factors from a thorough review of literature (Deming, 1986; Juran, 1986; Crosby, 1979; Flynn et al; 1995 and Saraph et al., 1989). These factors are *(1) Committed leadership or executive commitment, (2) Employees empowerment, (3) Adoption and communication of TQM or adopting the philosophy, (4) Closer supplier relationships, (5) Training, (6) Open organization, (7) Closer customer relationships, (8) Benchmarking (9) Process improvement, (10) Zero-defects mentality, (11) Measurements and (12) Flexible manufacturing*.

Sila and Ebrahimpour (2002) reviewed the research studies performed from 1989 to 2000 period and provided an ample discussion on critical success factors of TQM. They identified 25 factors from 347 research studies conducted on TQM from 1989 to 2000. Wali et al. (2003) performed a comprehensive empirical study of quality practices in the Indian context and identified twelve factors of TQM. Sharma (2006) reviewed the 12 quality management factors suggested by Powell (1995) as comprehensive dimensions of a TQM program. Mellat et al. (2007) incorporated the 13 quality management constructs proposed by Rao et al. (1999) to evaluate the effectiveness of quality management practices. The above literature reveals leadership, teamwork, and customer focus as the most important critical factors of TQM. The literature further explains that these studies have some common TQM practices such as employee empowerment and involvement, education and training, supplier quality management and process management.

### **Insert Table I Here**

By following the literature, this study focuses on the seven TQM practices:

- Top management's commitment to quality
- Employee involvement
- Customer focus
- Fact-based management
- Incentive and recognition system process
- Monitoring and control

- Continuous improvement

### **Performance Measurement**

Performance measurement is very essential for the valuable management of an organization. Scholars have used different performance types such as financial, business, innovative, operational and quality performance while examining the association between TQM practices and performance (Zehir et al., 2012). Literature on TQM practices incorporates diversified measures of performance such as Corporate Performance (Easton and Jarrell, 1994), Business Performance (Brah et al., 2000), Organizational Performance (Sterman et al., 1997), Plant Performance (Choi and Eboch, 1998), Operational Performance (Terziovski and Samson, 1999), Financial Performance (Agus and Hassan, 2000) and Stock Price Performance (Hendricks and Singhal, 2001). However, the existing studies do not provide much evidence on how exactly TQM practices affect performance, i.e. they do not allow comparison with the level of improvement of different dimensions of performance due to TQM adoption (Kumar et al., 2009). Therefore, to measure the impact of TQM practices on various levels of improvement, this study incorporates different dimensions of performance such as quality, business and organizational performance.

### **Relationship between TQM Practices and Quality Performance**

According to Deming (1986), major determinant of success in competitive environment is quality. Feng et al. (2006) argued that in today's concurrent market place, firms must focus on improving quality and innovativeness. TQM implementation generally has strong and positive relations with Quality performance (Brah et al., 2002; Prajogo and Sohal, 2003; Zehir et al., 2012). Kaynak (2003) revealed that TQM is relevant to the indicators of quality performance. Similarly, Kumar et al. (2009) found improvement in process, product and service quality resulting from TQM practices. TQM practices have a significant positive effect on quality performance as shown in empirical studies (see Table II). All these studies have statistically significant results ( $p < 0.01$ ) with positive Pearson's correlation coefficient ( $r$ ) ranging from .420 to .559. So, this study aims to clarify the effects of TQM practices on quality performance. The indicators for quality performance in this study are defects rate, rework, cost per product, customer complaint, cycle time and delivery time. Hence, this study proposes the first hypothesis:

**H<sub>1</sub>:** TQM practices have a positive Impact on quality performance of the organization.

### **Relationship between TQM Practices and Business Performance**

As per Deming (1986) without measuring something, it is improbable to enhance it. Hence to upgrade performance, one ought to confirm the degree of TQM implementation and measure its effect on business performance (Madu et al., 1996; Gadenne and Sharma 2002). Solis et al. (1998) found that quality management significantly leads to business performance improvements (Quality citizenship, Quality results, Customer orientation, and Quality

assurance). Gadenne and Sharma (2002) stated that Supplier quality cooperation and Defects reduction leads to business results improvements. Similarly Lagrosen & Lagrosen (2003) found that Quality management leads to business performance. In the same way, Huarng and Chen (2002) also reported an impact of TQM on business performance. Terziovski and Samson (1999) found positive relationship between TQM implementation and business performance. Barah et al. (2000) showed that there is positive association between TQM implementation and Business Performance of the organization. Consequently, TQM practices are significantly positively associated with the business performance as shown in different empirical studies (see Table II). All these studies have statistically significant results ( $p < 0.01$ ) with positive Pearson's correlation coefficient ( $r$ ) ranging from 0.013 to 0.572.

In this study, business performance indicators include an increase in *total sales, market share and net profit of the organization*. So, regarding TQM and business performance relationship, this study further proposes:

**H<sub>2</sub>:** TQM practices have a positive impact on the Business performance of the organization.

### **Relationship between TQM Practices and Organizational Performance**

TQM practices have positive association with organizational performance Kaplan and Norton (1996) underlined that conventionally, organizational performance is measured by monetary pointers such as market share, total sale, and net profit etc. Hence, to overcome potential inadequacies of organizational performance frameworks, this study in addition incorporates non-financial classes: *Improvement in employees' attitude towards quality, Improvement of the flow of information among departments, Reduction in absenteeism, Reduction in tardiness rate, Improvement in skill's level*, etc. for measuring organizational performance. Several authors (Serman et al., 1997; Choi and Eboch, 1998; Samson and Terziovski, 1999; Brah et al., 2002; Brah and Lim, 2006; Demirbag et al., 2006; Feng et al., 2006) identified positive association between TQM implementation and organizational performance. Table II explains the studies that show statistically significant results ( $p < 0.05$ ) with positive Pearson's correlation coefficient ( $r$ ) ranging from 0.18 to 0.87. Therefore this study further hypothesizes:

**H<sub>3</sub>:** TQM practices have a positive impact on the Organizational performance.

**Insert Table II Here**

### **Conceptual Framework**

The conceptual framework of this study (see Fig. 1) demonstrates the relationship between TQM practices and performance through exploring the combined direct effects of seven TQM practices on three different levels of firm's performance, i.e. quality, business and organizational performance.

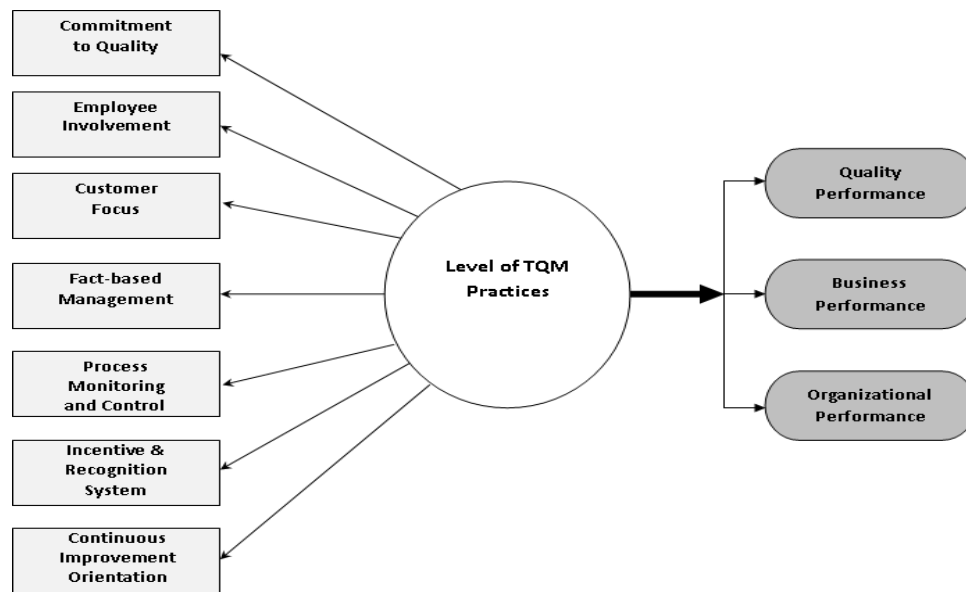


Figure 1: Conceptual Framework of TQM Practices and Performance

### Data Collection, Sample and Measurement Scales

A total 250 manufacturing-related medium and large sized companies were selected from the index of Karachi stock exchange (KSE) operating in six big cities (Karachi, Lahore, Faisalabad, Gujranwala, Gujrat and Multan) of Pakistan. A structured questionnaire was adapted from a similar previous study (Talavera, 2005). Data were obtained through survey questionnaires, which were sent to the respective organizations through mail. A total of 250 questionnaires were sent to the production and quality staff (quality managers, Area mangers, general manager, directors, and administrative partners) of the 250 selected manufacturing firms. Questionnaires were numbered as they were sent to the respondents so that non-respondents to be traced and follow-up to be done. Follow-up was done through telephone calls and e-mails to those who had not responded after two weeks. Out of 250 questionnaires, only 171 questionnaires were received, hence response rate of study is recorded as 68.2%. Of the 171 questionnaires, 21 questionnaires were rejected due to incomplete responses. So, 150 valid and useable questionnaires have been used to conduct final data analysis.

The firms represented the sample, varied in size (as measured by the number of employees, ranging from less than 500 to more than 1,000 workers); assets (less than 50 to more than 500 Million Rupees) and industry type (Textile 37.3%; Fertilizers 1.3%; Pesticides 2.0%; FMCG 5.3%; Chemicals 10.7%; Electronics 14.0%; Pharmaceuticals 6.0%; Others 23.3%). Category of "others" included footwear, accessories, plastic, rice mills, wheat mills etc. Regarding level of TQM

adoption; only 6% responses are from the firms that have TQM adoption level of less than 60%. Majority of the firms (67 %) have TQM adoption level of between 71%-90%.

### **Insert Table III Here**

For current study with the help of SPSS by using Principal Component Analysis and Varimax Rotation, Factor loadings of TQM practices and performance criterion have been presented in Tables IV and V respectively. Hill and Petty (1995) has referred Tinsley and Tinsley (1987) to reveal that 0.30 is a normal acceptable value of factor loading as it shows approximately 10% of the variance has been explained by a factor for a corresponding variable. Table IV individually shows nine factor solution of TQM practices in shape of *Commitment to Quality* (5 items), *Employee Involvement* (4 items), *Customer Focus-a-* (4 items), *Customer Focus-b-* (3 items), *Fact-based Management-a-* (4 items), *Fact-based Management-b-* (9 items), *Process Monitoring and Control* (5 items), *Incentive and Recognition System* (3 items) and *Continuous Improvement Orientation* (5 items) explained 61.01%, 57.11%, 65.60%, 66.20%, 59.99%, 45.29%, 62.31%, 51.23% and 62.31% of total variance respectively. Further, Table V individually shows three factor solution of performance criterion i.e. *Quality Performance* (5 items), *Business Performance* (3 items) and *Organizational Performance* (8 items) explained 43.09%, 55.50% and 49.62% of total variance respectively. Moreover, Kaiser-Meyer-Olkin (KMO) test of sample adequacy ranges from .624 to .868 for all independent and dependent variables as shown in Table IV and Table V.

Moreover, Table IV also presents individual values of Cronbach's Alpha of all nine factor of TQM practices such as *Commitment To Quality* ( $\alpha=.690$ ), *Employee Involvement* ( $\alpha=.749$ ), *Customer Focus-a-* ( $\alpha=.730$ ), *Customer Focus-b-* ( $\alpha=.742$ ), *Fact-based Management-a-* ( $\alpha=.739$ ), *Fact-based Management-b-* ( $\alpha=.839$ ), *Process Monitoring and Control* ( $\alpha=.830$ ), *Incentive and Recognition System* ( $\alpha=.735$ ) and *Continuous Improvement Orientation* ( $\alpha=.848$ ) showing sufficient reliability of the scale. Similarly, Table V presents Cronbach's Alpha values of dependent variable such as quality performance ( $\alpha=.661$ ), business performance ( $\alpha=.669$ ) and organizational performance ( $\alpha=.868$ ) showing acceptable reliability of the scale.

### **Insert Table IV and V Here**

Moreover, for correlation and regression analysis purpose, we have merged the Customer Focus (a) and (b) and Fact-based Management (a) and (b) in to one factor each, so finally for further analysis seven factors of TQM practices along with three factors of performance have been taken in this study.

### **Research Findings**

Table VI presents the correlation matrix of all the study variables. Pearson's Correlation is a measurement of the strength of a linear relationship between two variables. Table VI shows a high degree of significance correlations between TQM practices and quality, business and organizational performance (Pearson's correlation is significant at 0.01 level); however



correlation coefficient is less than 0.85, which eliminates the possibility of multi-collinearity. Similarly, Table VII shows the overall regression analysis of study's variables. The significant standardized Beta Coefficients values ( $P < 0.01$ ) between TQM practices and quality, business, and organizational performance confirm our study's hypotheses which are discussed as follows:

Hypothesis H1 states that TQM practices have a positive impact on quality performance of the organization. The results of correlation analysis as shown in Table VI indicate a positive significant relationship between TQM implementation and quality performance ( $r = 0.364$ ,  $p < 0.01$ ). Moreover, Regression analysis as shown in Table VII also confirms the high impact of TQM practices on quality performance. Hence, we can conclude that TQM with its various dimensions explained 13.3 percent of the variance in quality performance. Moreover, the models' respective F, beta coefficient and T values are significant ( $F=22.63$ ,  $t=4.757$ ,  $\beta=0.364$ ,  $p < .001$ ) showing that there is strong relationship between level of implementation of total quality management and quality performance, hence, H1 is supported.

Hypothesis H2 states that TQM practices have a positive impact on the Business performance of the organization. The results of correlation analysis as shown in Table VI indicate a positive significant relationship between TQM practices and quality performance ( $r = 0.356$ ,  $p < 0.01$ ). Moreover, Regression analysis as shown in Table VII also confirms the high impact of TQM practices on quality performance. Hence, we can conclude that TQM with its various dimensions explained 12.7 percent of the variance in quality performance. Moreover, the models' respective F, beta coefficient and T values are significant ( $F=21.546$ ,  $t=4.642$ ,  $\beta=0.356$ ,  $p < .001$ ) showing that there is strong relationship between level of implementation of TQM practices and business performance, hence, H2 is supported.

Hypothesis 3 states that Total Quality Management practices have a positive impact on the Organizational performance. The results of correlation analysis as shown in Table VI indicate a positive significant relationship between TQM practices and quality performance ( $r = 0.514$ ,  $p < 0.01$ ). Moreover, Regression analysis as shown in Table VII also confirms the high impact of TQM practices on quality performance. Hence, we can conclude that TQM with its various dimensions explained 26.4 percent of the variance in quality performance. Moreover, the models' respective F, beta coefficient and T values are significant ( $F=53.11$ ,  $t=7.28$ ,  $\beta=0.514$ ,  $p < .001$ ) showing that there is strong relationship between level of implementation of TQM practices and organizational performance, hence, H3 is supported.

#### **Insert Table VI and VII Here**

To know whether the extent of TQM adoption varies as per industry type, company size and assets possession in Pakistani Manufacturing sector, one-way ANOVA is also performed. The results of the analysis are presented in Table VIII. The analysis shows that no difference in the implementation level of TQM exists between various sectors. However, result shows that as the size of company (in terms of employee) increases, the implementation level of TQM also increases. This finding is consistent with prior quality management literature (Powell, 1995; Fisher, 1993; Hendricks and Singhal, 2001; Taylor and Wright, 2003). Finally the results of

ANOVA reveal that company size may impede successful TQM implementation as larger firms were more likely to adopt TQM than smaller firms. Among the three major categories of assets, analysis reveals that TQM implementation in the firm with greater asset is more as compared to the others with low assets possession.

**Insert Table VIII Here**

## **Discussion and Conclusion**

The present study sought to examine the impact of TQM practices on quality performance, business performance and organizational performance of Pakistani manufacturing firms located in six big industrial cities. The results of this study support our hypotheses that greater degree of implementation of TQM practices results in higher-quality performance (H1), business performance (H2) and organizational performance (H3).

Survey results show that 26.4% changes in organizational performance are significantly associated with TQM practices. These results support the findings of prior researches (Demirbag et al., 2006; Rahman, 2000) by showing that TQM practices enhances organizational performance in terms of improvement in employees' attitude towards quality, improvement of the flow of information among departments, reduction in absenteeism, reduction in tardiness rate, improvement in skill's level.

The results further show that 13.3% improvement in quality (product based, user based, and manufacturing quality) and 12.7% changes in business performance (total sales, market share and net profit of the organization) are strongly attributed due to high implementation of TQM practices. This conclusion aligns with the findings of Prajogo and Sohal (2002) and Hurang and Chen (2002) who observed that organizations with high level of quality control implementation, exhibit a higher level of quality performance. This is conceivable as TQM was basically anticipated by its advocates (e.g. Deming, Juran, Crosby, and Ishikawa) as a main vehicle to achieve higher-quality performance. The results also support the findings of previous researchers (Brah et al., 2000; Terziovski and Samson 1999; Hurang and Chen 2002) who revealed clear evidence for the notion that TQM implementation improves business performance of the organization.

The results of this research formulate a number of important additions to the existing TQM literature. First, this study suggests that there is no significant difference among industries in the implementation of TQM practices. The results of our study support that all types of industries use TQM practices on common proposition henceforth substantiating the evidence. Second, the results show that the extent of implementation of quality management practices increases as the size of organization increases. The finding argues that as size of organization increases (in term of number of employees and volume of total assets), level of TQM implementation increases i.e. Corporate organizations tend to implement TQM practices to a greater extent in comparison to medium level organizations. This research reveals that the

organizations dealing in international businesses readily adapt quality management practices as compared to the organizations dealing in local businesses due to the intensity of competition.

### **Practical Implication and Future Considerations**

Based on the above discussion, this study provides essential guidelines for managers and administrators in dealing with quality management and continuous quality improvement initiatives in the organizations.

The main implication of the findings for managers is that with TQM implementation, manufacturing organizations are more likely to achieve better performance in customer satisfaction, employee relations, quality and business performance than without TQM. The study also provides an insight for the managers to understand that corporate level companies are more likely to adopt TQM than smaller ones; hence TQM implementation level varies according to the size of the firm and amount of resources available. This may infer that due to shortsightedness, the small companies foresee rewards of TQM implementation earlier than large companies and hence soon get disappointed and consequently TQM benefits as they take some time to mature; are reaped by the established firms that never get disappointed soon. The main conclusion of this study is that TQM definitely offers a strong base for dynamic organizations to manage the total quality culture that can promote their competency and abilities as well as other strategic priorities to gain competitive advantage.

The above managerial implications of the study must be considered in light of the limitations. Sample of the firms for this study drawn from the Textile, Fertilizers, Pesticides, FMCG, Chemicals, Electronics, Pharmaceuticals, Paper & Board, Footwear, Accessories, Plastic, Rice Mills, Wheat Mills and Sugar industry located in six big cities of the Pakistan, so the results may be generalized accordingly. Although the sample of the study is representative to the manufacturing sector only but Future studies in this area should be focused on investigating the comparative study of TQM in the manufacturing and service industry to further validate the results. Finally, this study examines the impact of TQM as a whole on quality, business and organizational performance. Future research could further explore the individual role of TQM variables in determining various levels of performance as conducted in several previous TQM studies (Powell, 1995; Flynn et al., 1995; Samson and Terziovski, 1999). This would provide further insights in this area. For example, in manufacturing sectors, which component of TQM is the key determinant in achieving high quality product. Future research could also investigate the TQM implementation in firm while considering the "Pure" elements of Hard TQM as well as Soft TQM (i.e. clear differentiation and comparison between both elements). This would hopefully tile the way towards creating a much better understanding of TQM implementation issues and help improve the success rates of TQM implementation.

**Table I: Critical Success Factors Of TQM Identified By Different Authors**

Sr. #	Authors	Critical Success Factors of TOM											
		1	2	3	4	5	6	7	8	9	10	11	12
1	Rahman (2001)	√	√		√			√	√		√		
2	Brah et al. (2002)	√	√		√	√					√		
3	Prajogo and Sohal (2003)	√	√		√			√	√		√		
4	Talavera (2004)	√	√							√		√	√
5	Sila (2005)	√	√	√	√	√							
6	Prajogo (2005)	√	√		√			√	√		√		
7	Tari et al. (2006)	√	√	√	√	√							
8	Brah and Lim (2006)	√	√	√	√								
9	Karuppusami &	√	√	√	√	√	√						
10	Demirbag (2006)	√			√	√	√						
11	Sila (2007)	√	√	√	√	√							
12	Ou et al. (2007)	√	√	√	√	√							
13	Fryer et al. (2007)	√			√	√	√						
14	Macinati (2008)	√			√	√							
15	Ya'acob (2008)	√	√	√		√							
16	Al-khalifa et al. (2008)	√	√	√	√		√						
17	Salaheldin (2009)	√				√	√						
18	Satish & Srinivasan (2010)	√	√		√	√		√			√		
19	Malik & Khan (2011)					√	√				√		
20	Arumugam & Mojtahedzadeh	√	√	√	√	√	√						
21	Zehir et al. (2012)	√	√		√	√				√			√

Note: (1) Leadership/Top Management (2) Customers Focus (3) Teamwork (4) Process Management (5) Supplier Quality Management (6) Training (7) Strategic Planning (8) People Management (9) Employee Involvement (10) Information and Analysis (11) Incentive and Recognition (12) Continuous Improvement

**Table II. Examining effect of TQM Practices on Performance**

Study	Research Examining the effect of TQM Practices on Quality, Business and Organizational Performance	sig	r
Vinuesa and Hoque	TQM practices are positively associated with the quality performance	P<0.01	0.42
Zehir et al. (2012)	TQM dimensions are positively associated with quality performance indicators	P< 0.01	0.439to0.559
Prajogo (2005)	TQM model has significant strong impact on quality performance in the organizations	P < 0.05	0.56* $\beta$ value
Vinuesa & Hoque	TQM practices are positively associated with the business performance	P<0.01	0.35
Solis et al. (1998)	Business performance is highly correlated with TQM implementation	P<0.01	n.a.
Gadenne and Sharma (2002)	TQM practices improve business performance	P < 0.05	0.013to0.572
Lagrosen & Lagrosen (2003)	Total Quality management have significant impact on improving business performance	P<0.05	0.038
Karani and Bichanga (2012)	Organization's performance is highly correlated with TQM implementation	P<0.01	0.87
Joiner (2007)	High correlation between TQM practices and organizational performance	P<0.01	0.63
Malik et al. (2008)	Positive correlation between TQM practices and organizational performance	P<0.01	.18 to .84
Terziovski and Samson (1999)	TQM has a significantly positive effect on organizational performance	P<0.01	42.88** F value
Chong and Rundus (2004)	TQM practices focused on product design are positively associated with organizational performance	P<0.05	0.251
Chong and Rundus (2004)	TQM practices of customer focus are positively associated with organizational performance.	P<0.01	0.347

Note: N.A. = not available, \* =  $\beta$  value, \*\* = F value, r = Pearson correlation coefficient, sig = significance

TQM Adoption	N	Percent of Total	Cumulative Percentage
below 60%	9	6%	6%

61 % to 70%	21	14%	20%
71% to 80	47	31%	51%
80 % to 90 %	54	36%	87%
91% to 100%	19	13%	100%
Total	150	100%	

Factor	Factor Name	Description	Factor Loading	Scale Reliability (Cronbach Alpha)
1	<b>Commitment to Quality (KMO=0.624) (Variance explained = 61.01)</b>	Inclusion of Customer's Requirement and Supplier feedback in Produce development	.798	.690
		Input from Tech. Experts and Engineers	.750	
		Services and Product reviewed by Team	.667	
		Benchmarking practices of company to improve quality	.656	
2	<b>Employee Involvement (KMO=0.747) (Variance explained = 57.11)</b>	Employees are involved in quality management programs	.833	.749
		Quality Circles are in Place	.793	
		Quality goals are formally written in quality policy	.700	
		Cross functional teams exist to develop and improve quality	.687	
3 (a)	<b>Customer Focus (KMO=0.665) (Variance explained = 65.35)</b>	Existence of program to Improve Customer Service	.845	.730
		Top Management is involved in planning quality	.833	
3 (b)	<b>Customer Focus (KMO=0.688) (Variance explained = 66.20)</b>	Lessons learned from the training programs are integrated	.749	.742
		Techniques to measure external customer satisfaction		
		<ul style="list-style-type: none"> <li>• Market Research Survey</li> <li>• Customer satisfaction survey</li> <li>• Customer Dialogues</li> </ul>	.825 .817 .797	
4(a)	<b>Fact-based Management (KMO=0.668) (Variance explained = 59.99)</b>	Control chart	.842	.739
		Brainstorming	.814	
		Pareto analysis	.800	
		Cause and effect diagram	.514	
4(b)	<b>Fact-based Management (KMO=0.812) (Variance explained =</b>	Training programs on quality control are provided to employees	.914	
		Training programs on problem solving are provided to employees	.914	

**Table IV: Varimax Rotation component analysis matrix factor of Independent Variable**

Factor	Factor Name	Description	Factor Loading	Scale Reliability (Cronbach Alpha)
	45.29)	Design for manufacturability	.802	.839
		Quality function development	.757	
		Concurrent engineering	.743	
		Design for assembly	.724	
		Design for quality	.718	
		Shingo's error proofing technique	.709	
		Taguchi methods	.567	
5	<b>Process Monitoring and Control (KMO=0 .829) (Variance explained = 62.31)</b>	Periodic quality audits are regularly conducted	.821	.830
		Monitoring and evaluation of employees compliance	.797	
		Adoption of repair and preventive maintenance	.755	
		The quality targets and strategies are regularly viewed	.746	
		Suppliers selection is primarily based on quality	.743	
6	<b>Incentive and Recognition System (KMO=0 .666) (Variance explained = 51.23)</b>	Company application for recognition and quality awards	.849	.735
		Application for ISO 9000 certification	.816	
		Incentives to employees	.760	
7	<b>Continuous Improvement Orientation (KMO=0 .826) (Variance explained = 62.31)</b>	Continual review to improve product quality	.840	.848
		Continual review to cut failure costs	.829	
		Continuous Improvement signboards and labels are placed on easy location and identification	.817	
		System for segregating needed items from unneeded	.726	
		Programs on waste elimination	.726	

**Table V: Varimax Rotation component analysis matrix factor of Dependent Variables**

Factor	Factor Name	Description	Factor Loading	Scale Reliability (Cronbach Alpha)
1	<b>Quality Performance (KMO=0.605) (Variance explained = 43.09%)</b>	Reduction in Cycle time	.734	.661
		Reduction in Customer complaint	.729	
		Reduction in Defect rate	.659	
		Reduction in Delivery time	.574	
		Reduction in Rework	.566	

2	<b>Business Performance (KMO=0.681) (Variance explained = 55.50%)</b>	Increase in Total sales	.888	.669
		Increase in Market share	.879	
		Increase in Net profit	.755	
3	<b>Organizational Performance (KMO=0.878) (Variance explained = 49.62%)</b>	Increase in Employees attitude towards quality	.799	.868
		Increase in Quality of product/services provided by one department to another	.787	
		Increase in Communication between departments	.748	
		Increase in Teamwork and cooperation among employees of different departments	.724	
		Increase in Flow of information among departments	.708	
		Increase in Teamwork and cooperation among employees within department	.683	
		Increase in Communication between management and rank and file	.677	
		Increase in Quality of product/services provided by our employees to our customers	.617	
		Increase in Employees pride in one's work	.562	

Table VI: Correlations														
		Mean	SD	1	2	3	4	5	6	7	8	9	10	11
1	<b>TQM Practices (average of Seven TQM practices)</b>	3.939	.549	1										
2	<b>Commitment to Quality</b>	4.012	0.643	.758**	1									
3	<b>Employee Involvement</b>	3.908	0.728	.798**	.657**	1								
4	<b>Customer Focus</b>	4.042	0.702	.829**	.562**	.554**	1							
5	<b>Continuous Improvement</b>	3.767	0.908	.779**	.444**	.466**	.653**	1						
6	<b>Fact-based Management</b>	4.038	0.668	.723**	.378**	.497**	.485**	.471**	1					
7	<b>Incentive and Recognition System</b>	4.101	0.700	.781**	.450**	.558**	.641**	.657**	.550**	1				



8	Process Monitoring and Control	4.002	0.733	.819**	.618**	.585**	.621**	.596**	.545**	.673**	1			
9	Quality Performance	4.585	0.825	.364**	.312**	.244**	.337**	.337**	.168*	.289**	.353**	1		
10	Business Performance	4.047	0.594	.356**	.260**	.216**	.325**	.437**	.149	.257**	.274**	.144	1	
11	Organizational Performance	4.029	0.551	.514**	.409**	.396**	.367**	.332**	.445**	.393**	.478**	.259**	.226**	1

\*\* . Correlation is significant at the 0.01 level (2-tailed).  
\* . Correlation is significant at the 0.05 level (2-tailed).

**Table VII: Regression analysis**

Model	Independent Variable	Dependent Variable	Standardized Beta Coefficient		t-value	p-value	R <sup>2</sup>
			Std. Error	β			
1	TQM Practices	Quality Performance	.115	.364	4.757	.000	.133
2	TQM Practices	Business Performance	.083	.356	4.642	.000	.127
3	TQM Practices	Organizational Performance	.071	.514	7.288	.000	.264

**Table VIII: List of Sampled industrial Sector**

Industrial Sector	N	Mean
Fertilizer	2	4.15
Textile	56	3.88
Pesticides	3	3.78
FMCG	8	4.38
Chemical	16	3.76
Electronic	21	3.88
Pharmaceutical	9	4.19
Others	35	3.99
Total	150	3.94
ANOVA Sig.(p-value = .167)		
No. of Employee	N	Mean
<500	46	3.70
500-1000	55	3.89
>1000	49	4.22
Total	150	3.94
ANOVA Sig. (p-value <.001)		
Assets	N	Mean
<50 M	4	3.13
50M-100M	20	3.80
100M-200M	42	3.83

200M-500M	39	3.95
>500M	45	4.17
Total	150	3.94
ANOVA Sig. (p-value <.001)		

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