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Total Quality Management and Innovation Performance: An Empirical Evaluation of Quality and Innovation in Dubai Islamic Bank Pakistan

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ABSTRACT

The empirical study seeks to investigate the relationship between total quality management practices and organizational quality and innovation performance of Dubai Islamic Bank, Pakistan Dubai Islamic Bank, Pakistan. The current research study adapted the scale from previous studies and the data will be collected through self-administered questionnaires from managerial/administrative staff Dubai Islamic Bank, Pakistan. This research work contributed to the TQM literature with understanding of the relationship between TQM practices and banking organization's quality and innovation performance, which reveals some crucial guidelines for the senior management of the Dubai Islamic Bank, Pakistan to modify the current implementation process of TQM practices to ultimately ameliorate the organizational quality performance and innovation performance.

Keywords: Total quality management (TQM) practices, quality performance, innovation performance. Banking industry, Pakistan

INTRODUCTION

In the current era of globalization, organizations have been operating their business in rapidly changing and highly competitive business environments (Hitt et al., 2000). To enhance the organizational performance the top managers must have to be committed to evaluate the competitive strategies and other management practices in order to face the increased competition of current globalized era. Therefore, organizations need to adopt a new management philosophy which involves new strategies, modified management practices and distinctive organizational outcomes to develop quality organization with relentless improvements and sustainable performance and this management philosophy is normally referred as total quality management (Terziovski and Samson, 1999). From the last two decades total quality management is one of the most common and long lasting management concept (Rahman and Bullock, 2005). Total quality management is a system to continuously improve the quality, encouraging employee participation, reforming the organizational culture and promoting teamwork to accomplish the organizational goals and objectives (Persico, 1989). TQM is a systematic approach to quality improvements aiming to ameliorate the performance of the firms in terms of quality, customer satisfaction, productivity, and profitability (Sadikoglu and Zehir, 2010).

Total quality management has been referred to as second industrial revolution (Kanji, 1996). In the industrialized and developed countries like UK, Japan, USA, and European countries, the organizations give relentless concentration to total quality management. From the last decade the researchers have started to examine the total quality management practices in the developing countries (Al-Swidi and Mahmood, 2012, Das et al., 2008, Hassan et al., 2012, Hoang et al., 2006, Khanna, 2010, Satish and Srinivasan, 2010, Temtime, 2003) and the reason behind this plausible pursuit is the breaking of trade barriers and the developing countries firms have extended their markets to international adversaries which required the quality improvements and innovative products or services. Various manufacturing

firms have adopted the total quality management practices as compared to service firms. But recently the service sector like education, telecommunication, hospitals, banks, insurance companies, and other financial and non-financial service firms have also move towards adopting total quality management practices and show their positive interest towards TQM (Hasan and Kerr, 2003). The banks functioning in investment banking and other disciplines are showing their growing interest towards adopting total quality management practices and they are getting more sophisticated about TQM in the current era of global competition (Yasin et al., 2004).

In total quality management perspective, several studies have been conducted which were examining the influence of total quality management on the organizational performance in both manufacturing and service sector. None of these studies has yet examined the impact of total quality management on the quality performance and innovation performance in the service sector. As in the service industry the quality and innovation has become critical to get business excellence and sustainable competitive advantage. The banking sector of Pakistan is appearing to be more interested in adopting total quality management practices and is getting more sophisticated about quality and moving towards innovativeness in order to survive in the current era of global competition. So, there is need for rigorous research that study (i) the extent of TQM practices implementation in Dubai Islamic Bank, Pakistan (DIBP) (ii) the quality performance of the bank DIBP, (iii) the innovation performance of DIBP, (iv) the relationship of TQM practices with their quality and innovation performance, (v) the influence of TQM practices on the quality performance and innovation performance.

The current study will add to total quality management literature by trying to meet the need for an empirical study that analyzes the recognized practices of TQM and then linking them to quality performance and innovation performance by using suitable statistical methods in the banking sector. The study applies this as a mean of recognizing the association between TQM practices and organizational performance in terms of quality and innovation in the banking sector. This research study will also contribute to the TQM literature by developing a framework elaborating the relationship between total quality management practices and quality performance as well as innovation performance. Another important contribution of this research is the identification of the extent of implementation of TQM practices and also investigation of the impact of the recognized TQM practices on the quality performance and innovation performance of banking organizations. The study will provide useful results for the banking organizations which help the in the application of TQM practices and improving their quality and innovation performance. Which will ultimately result in amelioration of organizational performance and progress of the banking sector as to the best of the knowledge, this is the first study in Pakistan that is investigating the impact of TQM practices on the organizational quality and innovation performance in the banking sector.

LITERATURE REVIEW

Defining quality is quite problematic. By reviewing the literature on the definition of quality, it is evident that there is no general consensus on defining the quality. Several scholars have different views as the most are the quality *"gurus"* which are Deming, Crosby, Feigenbaum, Juran, Ishikawa, Taguchi, and Shewhart are mostly examined first to know about definition of quality. Quality has been defined by (Crosby, 1979) as "conformance to specifications". Moreover, he argued that the firms have to know about the requirements of the products or services and translate them into the characteristics of products or services. It is unclear from the definition given by the Crosby about the different levels of quality. Are the entire products or services meet the pre-defined requirements are of equal quality? This has been addressed by other quality gurus.

Over the time, the concept of total quality management has been developed from inspection. It is generally thought that the Egyptians were the people who firstly use inspection as a tool to test for quality when they were constructing the pyramids. But in the second world war the inspection was going impractical to test the aircrafts due to complex technology and increased cost of staff and equipment (Kanji, 2002). Quality control is developed through inspection and quality control involves the quality manuals, self-inspection, testing of products, and control of documents in order to assure the product quality. The later stages involves the move from the attention on product quality through quality control to the quality management or quality assurance (Kanji, 2002).

As there are various definitions of quality, the same as TQM has been defined in various perspectives. (Juran, 1974) argued that TQM can be defined as "fitness for use". Juran also identified another concept of quality trilogy which includes first the quality planning, second is the quality control and the third quality improvement. (Crosby, 1979) enunciated that quality management is an approach which relates to the suppression of occurring problems through the creation of attitudes and controls which make such suppression operational. Crosby further put stress on the phrase that is "Do it right the first time" and also "zero defects" which entails that the suppression system is significant and crucial to achieve these. Crosby also emphasized that the management role is crucial to the quality amelioration efforts and also the firms must have to use statistical process control technique in measuring the quality.

In the evolution of total quality management, most of the studies were conducted which focus on the manufacturing industries as compared to service sector. But later on due to increase in competition level in the service industry the researchers move to study the TQM influences in the service sector also (Juneja et al., 2011). There is difference in TQM practices in manufacturing and service sectors. As in manufacturing the firms focus on the quality of products and processes but on the other hand service firms focus more on the customer satisfaction (Lenka et al., 2010). Other studies revealed several benefits of implementing TQM as client satisfaction, social effects, and employee satisfaction (Tarí and Molina, 2002) and superior performance in strategic planning, human resource focus, market and customer focus, information system, process management, leadership and business excellence (Lau et al., 2004) enhanced productivity and better quality of products and services (Rahman and Siddiqui, 2006) and also efficient performance measures (Chin et al., 2003) sustainable competitive edge (Bayazit, 2003) and ameliorates the employee productivity (Chapman and Al-Khawaldeh, 2002).

There are various total quality management practices which are used by different studies to study the impact of TQM on the multiple performances of the organization. The current study will consider the generally accepted total quality management practices or dimensions which are top management commitment, customer focus, continuous improvement, employee involvement, and process management, these are widely recognized by (Cho and Pucik, 2005, López-Mielgo et al., 2009, Prajogo and Brown, 2004, Sadikoglu and Zehir, 2010, Wilkinson et al., 1998). These practices are considered to be the most critical and significant dimensions of total quality management (Claver et al., 2003, Conca et al., 2004, Sila and Ebrahimpour, 2003). Other studies identified that these dimensions are most significant and influential practices of TQM (Juran, 1988, McAdam and Armstrong, 2001, Prajogo and Sohal, 2003, Zairi, 1997).

One of the most important determinants of TQM success is the top management commitment as the commitment towards quality improvement results in more effectiveness and enhancive performance overall, because without positive commitment of management all the TQM strategies will likely to fail (Kanji, 2002). In another study (e Sá and Kanji, 2003) argued that the main challenge for the top management is to coordinate the relationship among organization's vision, mission statement, values and strategies, as the vision and mission statement provides the direction or a roadmap which leads to improved performance. The studies enunciated that the top management must have to create a quality vision, also communicate the vision in all the organization's departments, and develop a quality culture where employees are involved in quality decisions and remove the resistance to change, concentrating on the customer needs and expectations, and encouraging relentless improvements. To achieve all these, the top management needs to actively involved and become more committed towards quality and give value to the quality programs (Anupam et al., 2000, Baidoun, 2004, Dering, 1998, Kanji, 2002, Lau and Idris, 2001, Parzinger and Nath, 2000, Zairi, 1999).

In the TQM literature significant importance is given to issues related to customer focus and their satisfaction and recently, this importance has been given in all the types of businesses (Sila and Ebrahimpour, 2002). Customer focus is a deprecative factor to attain high product quality (Ahire and O'shaughnessy, 1998, Dow et al., 1999, Zhang, 2000). There are four stages of quality improvement in an organization have been determined, which are inspection, statistical quality control, quality assurance, and strategic quality management (Lau et al., 2004, Yeung et al., 2006). TQM is a technique of quality improvement which stress the commitment of top management and the participation by every employee in the organization to provide quality products and services to meet the needs and demands of customers and to satisfy them (Arawati, 2001, Arawati and Mokhtar, 2000, Saravanan and Rao, 2006). Many of the newly introduced products and services are failed in the marketplace because these do not meet the needs and expectations of customers (Arawati and Mokhtar, 2000). One of the most

significant parts of producing or introducing new products or services is the customer focus. New products or services must meet the current and future demands and needs of customers of the firm. Customer focus is more pronounced by exceeding the expectations of the customers to gain the long term success and survival of firm (Dean and Bowen, 1994, Deming, 1986). The studies (Bullington et al., 2002, Deming, 1986, Hackman and Wageman, 1995, Johnston and Daniel, 1991) articulated that in the work settings of total quality management, firms are regularly identifying the changing needs and demands of customers by keeping close contacts to them through customer site visits, customer surveys, and focus groups , and also measure the firm's processes and performance against those requirements.

The organization contains a group of internally connected processes and the amelioration of these processes is the basis for enhancement of performance, this is actually the major idea behind process management in TQM. Effective process results in better performance of processes, create ownership sense in employees, and enrichment in quality of products or services which ultimately satisfy the needs and expectation of end user (Deming, 1986). There should be a system of "quality chain" which involves that all the activities in the organization can be broken down into the small basic processes and these processes should interlinked through quality chain to effect one another. This will help to centralize the customer needs and demands to the operations of the organization, and as a result the firm will provide their customers the required product or service by the adjustment of the processes consequently (Yong and Wilkinson, 2001).

As described earlier, an organization contains a group of internally connected processes. Here the process is termed as *"transformation process"* which involves the conversion of inputs e.g. operations, methods, and actions into outputs which include the product, service or any information that satisfy the consumer expectations (Okland, 1993). Furthermore, (Kanji, 2002) argued that process is a "combination of input and stages to follow to produce output". Moreover, process management approach needs a firm to develop processes which have patterns to conform with the quality requirements; evaluating the quality of processes; identifying the crucial processes and choose appropriate control points, implementing the suitable statistical methods to manage processes and use benchmarking approach to increase the knowledge about processes.

It is crucial to recognize the key processes and to get support of process to assure the availability of adequate resources for the examination and amelioration of processes. Training and education is necessary for the management and employees to understand the process management techniques and involvement of employees is crucial for better process management to meet the requirements of internal and external customers (Baidoun, 2004, Thiagaragan et al., 2001). The holistic perspective of TQM implementation requires the balance between internal process amelioration and conformance to customer's requirements and their satisfaction through innovation and flexible business improvements (Idris and Zairi, 2006). Some scholars argued that effective process management depends upon cleanliness and the organization of work at workplace (Flynn et al., 1994, Zhang et al., 2000).

There is a fact that without assessing something, it is harder to ameliorate it. TQM is recognized as an important long term strategy. So, the evaluation of quality is significant to gain strength, sustainability, and relentless improving performance (Zairi, 2002). Other studies showed that continuous performance snooping and feedback system play key role in continuous improvement and defect prevention and also decrease in number of errors; these are actually the main pillars of TQM. The performance snooping is normally used to track the performance of firms and constant instructions, supportive feedback system can be utilized to continuously improve the quality of products or services (Palo and Padhi, 2003). Organizational performance can be evaluated on multiple dimensions and there is no specific business approach that can give assurance to have uniform results on all dimensions (Walker Jr and Ruekert, 1987). Different perspectives for evaluation of organizational performance are market and financial performance (Yeung et al., 2006) innovation performance (Ang et al., 2011, Bon and Mustafa, 2013, Hung et al., 2011, Jitpaiboon and Rao, 2007, Juneja et al., 2011, Prajogo and Sohal, 2003, Prajogo and Sohal, 2004, Yong and Wilkinson, 2001, Zehir et al., 2012) employee morale and satisfaction of consumers (Abas and Yaacob, 2006, Terziovski et al., 1997) quality performance (Ahire et al., 1996, Flynn et al., 1995, Lee, 2004, Sadikoglu, 2008) exports and profit growth (Terziovski et al., 1997) production performance amelioration (Lee, 2004) and sales growth (Fuentes et al., 2006).

In the current era of globalized business world the foundation of competitive advantage has moved from quality to innovation (Saraph et al., 1989). There are different motives to seek for innovation by different organization, the major motive is to get competitive edge and attain sustainable competitive advantage. Different definitions are given in various studies, innovation has been defined as; *"the adoption of new idea or behavior that is new to the organization"* (Daft and Becker, 1978, Damanpour, 1988, Zaltman et al., 1973, Zammuto and O'Connor, 1992, Jiménez-Jiménez and Sanz-Valle, 2011). In some cases firms have to create new ideas of product or service, and this act of generating new ideas include invention as well as the work required to bring an idea or concept into final form (Belliveau et al., 2002). Other studies (Hage, 1999, Lafley and Charan, 2008) defined *"innovation as a new idea into benefits, revenues and profits".* Innovation is one of the key determinants of the long term success of the business in a dynamic market environment. Moreover, innovation helps the firms to deal with the changing external environment (Baker and Sinkula, 2002, Balkin et al., 2000, Darroch and McNaughton, 2003, Lyon and Ferrier, 2002, Scherer, 1992, Utterback, 1994, Vrakking, 1990, Wolfe, 1994). The significant point here is that the organizations adopting innovation cannot be successful until their products or services meet the quality standards (Zehir et al., 2012).

Total quality management is actually generic because TQM is normally implemented in manufacturing as well as service sector. In spite of their distinctive nature in both cases, the firms face same problems in gaining the full advantages of TQM implementation (Huq and Stolen, 1998). The main philosophy of total quality management is to satisfy the customer needs and wants for the survival of the organizations. TQM is a holistic approach to the amelioration of quality for the sake of improving organizational performance (Zehir et al., 2012). Total quality management is an approach for enhancing the organizational performance by keeping in view the both technical and behavioral contents (Rahman and Bullock, 2005). The implementation of TQM programs results in attaining long term sustainable competitive advantage to survive in a competitive market environment and enhancement of organizational performance and productivity. These TQM programs involved the new products or services development or improvement in the existing products or services and cost reduction (Al-Khalifa and Aspinwall, 2000).

Several previous studies have revealed that there is positive and significant relationship exist between the extent of TQM practices implementation and organizational performance (Ahire et al., 1996, Bayazit, 2003, Chin et al., 2003, Das et al., 2008, Lau et al., 2004, Rahman and Siddiqui, 2006, Su et al., 2001, Sun, 2000, Tarí and Molina, 2002, Terziovski and Samson, 1998, Terziovski et al., 1997, Terziovski and Samson, 1999, Rahman, 2001). Most of the research studies show positive and significant relationship between TQM practices and performance of firms in manufacturing concern (Awan and Bhatti, 2003, Malik et al., 2010, Raja et al., 2011, Saleem et al., 2011) and also in service sector (Khan, 2010, Khurram and Jafri, 2011, Quraishi et al., 2010, Sajjad and Amjad, 2011, Vakani et al., 2011). Some studies identified that the organizations implementing TQM practices perform better than the non-TQM firms. Moreover, they examined that the dedicated implementation of TQM practices help in achieving better operational results of quality amelioration (Ahire et al., 1996). Another study articulated that the cost of implementation of TQM practices is reasonable, as these practices yield more benefits than the cost incurred (Hendricks and Singhal, 1997). There are two major issues which must be carefully considered during TQM implementation process; that are focusing on the consumer satisfaction and executing efficient operations (Kakkar and Narag, 2007).

Hypotheses	***H***
There is an association between TQM practices and quality performance.	H_1
There is an association between TQM practices and innovation performance.	H_2
Top management commitment is associated with quality performance.	H_3
Customer focus is associated with quality performance.	H_4
Continuous improvement is associated with quality performance.	H_5
Employee involvement is associated with quality performance.	H_6

Process management is associated with quality performance.	H_7
Top management commitment is associated with innovation performance.	H_8
Customer focus is associated with innovation performance.	H_9
Continuous improvement is associated with innovation performance.	H_{10}
Employee involvement is associated with innovation performance.	H_{11}
Process management is associated with innovation performance.	H_{12}

The conceptual framework of this study is indicated below:

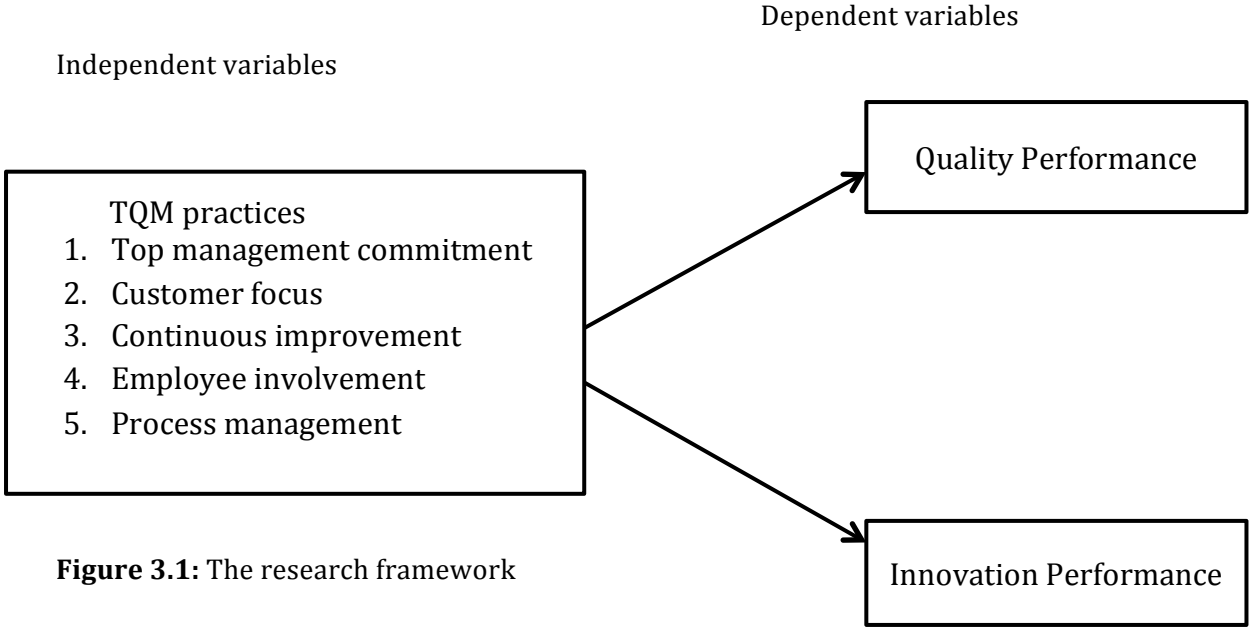

Figure 3.1: The research framework

RESEARCH DESIGN

The population of the study covers the only one bank of Pakistan named Dubai Islamic Bank, Pakistan. The sample size includes all employees working in whole bank. The structured questionnaires were personally administered among the managerial staff of DIBP Bank. A total of 325 questionnaires were distributed among the managerial staff in their respective branches in Pakistan. Only 242 questionnaires were received back with the response rate of 74.5%. Of the 242 questionnaires, 17 questionnaires were not completely filled and were rejected. So a total of 225 acceptable and valid questionnaires have been used in the current study for data analysis. For the current study, the instrument was adapted from previous studies. To measure the independent variable of total quality management which includes top management, customer focus, continuous improvement, employee involvement, and process management the 32-items scale were adopted from the scale developed in the research work of (Talib et al., 2013) and also to measure the dependent variable quality performance the 8-items scale were taken from the same study (Talib et al., 2013). As this instrument were previously tested for reliability and validity by the study. So this was considered valid to study the variables of TQM and quality performance. Another reason is that the adopted scale was developed to study the TQM practices and quality performance in the service sector and shown good reliability and validity in that study. On the other hand another dependent variable that is innovation performance was measured by the 2-items scale developed by (Prajogo and Sohal, 2004) and afterwards used by (Sadikoglu and Zehir, 2010) was used to assess the innovation performance of the banks.

The target respondents for the current study were the managers/administrative staff of the DIBP bank who have adequate experience with the bank and having adequate level of qualification. So that, the respondents will be aware of the quality management practices applied in the banking organizations. After the collection of raw data, firstly the questionnaire was coded in the SPSS 16.0 and after that the responses given by the respondents were entered in the SPSS 16.0 for analysis of data. Furthermore, the questionnaire was tested for reliability that was cronbach's alpha of .920. in order to evaluate the factor loadings of items, factor analysis was conducted to identify the elimination of any item. Moreover, the data analysis methods include (1) the descriptive statistics which involves the frequencies and percentages of respondent's profile and also means and standard deviation of responses, (2) the Pearson correlation analysis to evaluate the relationship among the variables, (3) the regression analysis to investigate the effect of independent variables on the dependent variables.

DATA ANALYSIS AND FINDINGS

The collected raw data, which includes the information about demographics of respondents (section one of questionnaire) and secondly the level of TQM implementation, and information about banking organization's quality and innovation performance (section two of questionnaire) was entered into the SPSS 16.0 software to conduct the following statistical analyses. The table 1 illustrates the profile of respondents as it includes the questions about respondent's gender, age, educational level, experience in the current bank, the type of bank, and asked about that either the bank obtained any quality award. It was observed that most of the DIBP employees were dominated by the males as there were 158 males (70.2%) and the rest were 67 females having percentage of 29.8%.

To examine the interrelationship among the variables and to identify the factor loadings of items of each variable, the most widely used data reduction statistical technique which is factor analysis (Prasad and Subbaiah, 2011). Factor analysis is a statistical technique of reducing data through the means of extracting the components with the method of rotations of different types. In the current research study, one of methods of factor analysis that is principal component analysis method is used with varimax orthogonal rotation on the 32 items of five TQM practices and also on the 8 items of quality performance and 2 items of innovation performance by the use of statistical software SPSS 16.0. There are some requirements set out by previous studies which need to be fulfilled before conducting this analysis which includes the sample size requirement as (Hair Jr et al., 1998) suggested that there should be the sample size of 100 or minimum of five subjects per variable of study to achieve better outcomes of this analysis. As the sample size of current study is 225 which is above than 35 subjects (5 subjects × 7 variables) or 100 subjects so, the requirement for execution of factor analysis is fulfilled.

The factor loading of each item represents its strength of relationship with the specific factor. The greater the value of loading, make stronger the relationship. Before moving towards the interpretations of factor loadings there are some standards set out by prior studies as the minimum acceptable loading value is 0.30 revealed from the work of (Hill and Petty, 1995, Tinsley and Tinsley, 1987) and some other researchers suggested the minimum requirement of 0.45 or 0.55 or 0.63 and even 0.71 as an excellent (Comrey, 1973). As the factor loading values of all the items of TQM practices were above the minimum requirement of 0.30 as shown in table 4.4. So, no items are deleted from the scale measuring the TQM practices. The Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy value is 0.756 which is above than 0.60 illustrates that adequate inter-correlation exists. And the Bartlett's test of sphericity has approximate chi-square value of 6194 and is significant ($\chi^2 = 6194$, $p = 0.000 < 0.01$).

The reliability analysis was also done to test the instrument for reliability. The overall reliability of the instrument showed the value of cronbach's alpha ($\alpha = 0.920$) which is above the minimum standard of 0.70 suggested by (Nunnally and Bernstein, 1994). Also for more clarification about reliability of instrument the dimension wise reliability were also tested as shown in table 4.5 and table 4.6 which reported the values of cronbach's alpha as the top management commitment ($\alpha = 0.860$); customer focus ($\alpha = 0.732$); continuous improvement ($\alpha = 0.783$); employee involvement ($\alpha = 0.608$); process management ($\alpha = 0.659$), the quality performance ($\alpha = 0.691$); and the innovation performance ($\alpha = 0.911$) indicating the acceptable reliability of the scale.

To identify the level of implementation of total quality management practices, the overall mean scores of each TQM practice was calculated. The results of mean scores are shown in table 4.4 which entails that the highly adopted TQM practice is the *"customer focus"* as its mean score is 4.01 followed by the

process management 3.99, the employee involvement 3.95, continuous improvement 3.88, and at the last is top management commitment towards quality with the mean score of 3.86. So it enunciates that the total quality management practices implementation is neither so moderate nor so high.

Table 4.2: The level of TQM implementation

Variables	Minimum	Maximum	Mean	Std. Deviation
TQM practices				
top management commitment	2.43	4.86	3.86	.580
customer focus	2.75	4.88	4.01	.399
continuous improvement	2.83	5.00	3.88	.551
employee involvement	3.00	4.67	3.95	.373
process management	3.00	5.00	3.99	.417
Organizational performance				
quality performance	3.25	5.00	4.05	.363
innovation performance	3.00	5.83	5.03	.567

To investigate the bivariate relationship between the main variables of study, the Pearson correlation analysis was conducted in this section of research study. And also with the help of this analysis the presence of multi-colinearity problems were identified. As the table 4.6 illustrated the coefficients of correlation between the five TQM practices (independent variables) and the organizational quality and innovation performance (dependent variables) which were assessed by multi-items scale in the current research study. As it is shown in the table that the correlation between the investigated variables are highly significant and positive ranging from 0.204 to 0.879 as it also ranges from 0 to +1 at $p < 0.01$ in all the cases. The correlation between the TQM practices is also highly positively significant ranging from 0.204 to 0.700 at $p < 0.01$.

Table 3: Pearson correlation of TQM practices, quality performance, and innovation performance

Variables	1	2	3	4	5	6	7	8
Quality performance	1							
Innovation performance	.258**	1						
Top management commitment	.374**	.260**	1					
Customer focus	.397**	.204**	.827**	1				
Continuous improvement	.266**	.299**	.700**	.603**	1			
Employee involvement	.308**	.232**	.468**	.471**	.425**	1		
Process management	.252**	.313**	.439**	.555**	.700**	.302**	1	
TQM practices	.394**	.327**	.879**	.860**	.876**	.634**	.740**	1
**correlation is significant at the 0.01 level (2-tailed)								

Regression analysis is the most significant and widely recognized statistical technique which is normally used to investigate the relationship among the independent or explanatory variables and the dependent or criterion variables (Hair Jr et al., 1998). This analysis is basically conducted to test the research hypotheses of study. Also the regression analysis illustrates the relative contribution of

independent variables towards the dependent variables. Meanwhile, the study also investigated the impact of overall TQM practices on the organizational quality and innovation performance of DIBP. The table 4 described the results of regression analysis of each TQM practice and the quality performance. All the total quality management practices have significant positive impact on the quality performance of DIBP.

Table 4: Regression analysis of TQM practices and quality performance

Independent variables	Dependent variables	Standardized coefficients		t-value	p-value	Adjusted R^2	F		D.W.
		Beta	Std. error				value	sig.	
Top management commitment	Quality performance	.374	.039	6.022	.000	.136	36.27	.000	1.72
Customer focus		.397	.056	6.462	.000	.154	41.76	.000	1.72
Continuous improvement		.266	.042	4.115	.000	.066	16.93	.000	1.88
Employee involvement		.308	.062	4.830	.000	.091	23.33	.000	1.95
Process management		.252	.056	3.884	.001	.059	15.09	.000	1.87

The standardized beta (β) coefficients of all the TQM practices are; top management commitment (β = 0.374, $p < 0.05$); customer focus (β = 0.397, $p < 0.05$); continuous improvement (β = 0.266, $p < 0.05$); employee involvement (β = 0.308, $p < 0.05$); process management (β = 0.252, $p < 0.05$). The significance value of *F* statistics in all the cases is (sig. = 0.000) which was significant at 1 percent ($p < 0.01$). In the current study the value of adjusted coefficient of determination (R^2) for the first OLS regression line was 13.6% which showed that there is a medium effect of top management commitment on the quality performance. The value of adjusted R^2 for the second model is 15.4% which enunciated that there was a higher level of impact of customer focus TQM practice on the quality performance. Moreover, there was medium effect of continuous improvement and employee involvement on the quality performance as their adjusted R^2 values were 6.6% and 9.1% respectively. But there is lower level of effect of process management on the quality performance as its adjusted R^2 value was 5.9%. The results of these regression analyses showed that the hypotheses H_3, H_4, H_5, H_6, and H_7 are supported.

As far as the relationship between all the TQM practices and innovation performance is concerned, the table 5 showed the results of ordinary least square regression analysis of each TQM practice and the innovation performance. The standardized beta (β) coefficients for all estimated parameters were significant and positive, as the top management commitment (β = 0.260, $p < 0.05$); customer focus (β = 0.204, $p < 0.05$); continuous improvement (β = 0.299, $p < 0.05$); employee involvement (β = 0.232, $p < 0.05$); and process management (β = 0.313, $p < 0.05$). The value of Durbin Watson statistics in all the regression models ranges from 1.50-2.50. So, there were no autocorrelation problems as suggested by (Durbin and Watson, 1951). The significance values of *F* statistics in all the five regression models were less than 0.05, it entails that all the regression models were fit to study and there was significant relationship exist between the variables.

The values of adjusted coefficients of determination (adjusted R^2) enunciated that the customer focus and employee involvement quality management practices have lower effects on the innovation performance as shown by their adjusted R^2 values which are 3.7% and 5.0% as less than 5.9% suggested by (Cohen, 1988, Jitpaiboon and Rao, 2007). On the other hand top management commitment, continuous improvement and process management have medium impact on innovation performance with the values of adjusted R^2 6.4%, 8.5%, and 9.4% respectively. So it entails that H_8 H_9 H_{10}, H_{11}, and H_{12} are supported. To study the overall impact of TQM practices on the quality performance and innovation performance, the regression analysis was conducted as shown in the table

6. The results of two ordinary least square regression models, as it showed that that in the first model of TQM practices and quality performance the standardized beta (β) coefficient value is 0.394 with the *p* value less than 0.05. The value of coefficient of determination (R^2) is 15.2% which shows that overall TQM practices have higher level of positive impact on the quality performance (Talib et al., 2013). The significance value of *F* statistics (*F* = 41.01, sig. = 0.000) showed that the statistical model was fit and there was positive relationship between TQM practices and quality performance. The value of D-Watson is 1.80 illustrated that there is no problem of autocorrelation. So, the outcomes inferred that H_1 is supported.

Table 5: Regression analysis of TQM practices and innovation performance

Independent variables	Dependent variables	Standardized coefficients		t-value	p-value	Adjusted R^2	F		D.W.
		Beta	Std. error				value	sig.	
Top management commitment	Innovation performance	.260	.063	4.029	.000	.064	16.23	.000	1.92
Customer focus		.204	.093	3.117	.002	.037	9.72	.002	1.94
Continuous improvement		.299	.066	4.677	.000	.085	21.88	.000	1.73
Employee involvement		.232	.099	3.565	.000	.050	12.71	.000	2.00
Process management		.313	.086	4.928	.000	.094	24.28	.000	1.78

Table 4.6: Regression analysis of overall TQM practices and organizational performance

Independent variables	Dependent variables	Standardized coefficients		t-value	p-value	Adjusted R^2	F		D.W
		Beta	Std. error				value	sig.	
TQM practices	Quality performance	.394	.059	6.406	.000	.152	41.04	.000	1.80
TQM practices	Innovation performance	.327	.095	5.163	.000	.103	26.66	.000	1.82

The second regression model investigating the impact of overall TQM practices on the innovation performance showed the standardized beta (β) coefficient value of 0.327 and significance value of ($p < 0.05$), it explains that there is a positive relationship between overall TQM practices and innovation performance. The value of adjusted R^2 in this case was 10.3% which entails that there is moderate impact of TQM practices on innovation performance. The value of D-Watson is 1.82 which means that there were no autocorrelation issues in the model and the value of *F* statistics was (*F* = 26.66, sig. = 0.000) also showed that the model was fit and there is positive relationship between TQM practices and innovation performance. So, the results enunciate that H_2 is also supported.

CONCLUSION AND IMPLICATIONS

The findings of this study were shown in the previous chapter extracted from different statistical analyses. As previously described, there were three research questions which were developed in this study. These research questions elicit about the extent of TQM implementation in banking sector, the

association between TQM practices and organizational performance, and identify that which of the five TQM practices has more association with organizational performance of DIBP. The findings of this study give the following answers to these research hypotheses as;

H_1: There is an association between TQM practices and quality performance.

The results of correlation analysis illustrated that there is a highly significant and positive relationship between TQM practices and quality performance as the correlation coefficient was (r = 0.394, $p < 0.01$). All the dimensions of total quality management significantly accounted for 15.2% of variation in the quality performance. Hence, it is concluded that the hypothesis (H_1) is accepted, and there is a positive and significant association between TQM practices and quality performance of DIBP.

H_2: There is an association between TQM practices and innovation performance.

The highly significant and positive relationship was enunciated in the correlation analysis test between TQM practices and innovation performance as the correlation coefficient was (r = 0.327, $p < 0.01$). All the dimensions of total quality management significantly accounted for 10.3% of variation in the innovation performance. Hence, it is concluded that the hypothesis (H_2) is finally accepted, and there is a significant and positive association between TQM practices and innovation performance of DIBP.

H_3: Top management commitment is associated with quality performance.

The correlation coefficient (r = 0.374, $p < 0.01$) illustrated that there is a highly significant and positive relationship exist between the top management commitment and quality performance of DIBP as shown in the correlation analysis. Moreover, the ordinary least square regression analysis enunciated the positive standardized beta (β) value (β = 0.374, $p < 0.05$). The value of *F* statistics was ($F = 36.27$, $p < 0.05$) significant which also showed the positive relationship and illustrated that the model was fit, and also the significant *t*-value was ($t = 6.022$). The dimension of total quality management that is *"top management commitment"* significantly explained the variation of 13.6% in the quality performance. Hence, it is proved that the hypothesis (H_3) is accepted, and it is inferred that top management commitment is significantly and positively associated with quality performance of DIBP.

H_4: Customer focus is associated with quality performance.

The outcomes of correlation analysis enunciated that there is a highly significant and positive relationship (r = 0.397, $p < 0.01$) exists between the customer focus and quality performance of DIBP and this TQM practice have the highest value of correlation coefficient as compared to others as shown in the correlation matrix It is inferred that the hypothesis (H_4) is finally accepted, and it is proved that customer focus is significantly and positively associated with quality performance of DIBP.

H_5: Continuous improvement is associated with quality performance.

The results of correlation analysis showed that there is a highly significant and positive relationship (r = 0.266, $p < 0.01$) exists between the continuous improvement and quality performance of DIBP as shown in the Pearson correlation matrix. Therefore, it is inferred that the hypothesis (H_5) is accepted, and there is a significant and positive association between continuous improvement and quality performance of DIBP.

H_6: Employee involvement is associated with quality performance.

The highly significant and positive relationship is enunciated in the correlation analysis test between TQM practices and innovation performance as the correlation coefficient was (r = 0.308, $p < 0.01$). Meanwhile, the ordinary least square regression analysis showed the positive standardized beta (β) value (β = 0.308, $p < 0.05$). The dimension of total quality management that is *"employee involvement"* significantly accounted for the 9.1% of variation in the quality performance. Hence, it is concluded that the hypothesis (H_6) is finally accepted, and it is proved that employee involvement is significantly and positively associated with quality performance of DIBP.

H_7: Process management is associated with quality performance.

The correlation analysis showed that there is a highly significant and positive relationship between one of the TQM practice that is process management and quality performance as the correlation coefficient was (r = 0.252, $p < 0.01$). It is inferred that the hypothesis (H_7) is accepted, and there is a significant and positive association between process management and quality performance of DIBP.

H_8: Top management commitment is associated with innovation performance.

The results of correlation analysis illustrated that there is a highly significant and positive relationship (r = 0.260, $p < 0.01$) exists between the top management commitment and innovation performance of DIBP as shown in the Pearson correlation matrix in table 4.6. Furthermore, the ordinary least square regression analysis enunciated the positive standardized beta (β) value (β = 0.260, $p < 0.05$). The value of F statistics was (F = 16.23, $p < 0.05$) significant which also verified the positive relationship and showed that the model was fit, and had the significant t-value (t = 4.029). And also the dimension of total quality management that is *"top management commitment"* significantly explained the variation of 6.4% in the innovation performance of DIBP. Hence, it is concluded that the hypothesis (H_8) is finally accepted, and is inferred that top management commitment is significantly and positively associated with innovation performance of DIBP.

H_9: Customer focus is associated with innovation performance.

The correlation coefficient (r = 0.204, $p < 0.01$) enunciated that there is a highly significant and positive relationship exist between the customer focus and innovation performance of DIBP and this TQM practice have the least value of correlation coefficient as compared to others as shown in the correlation analysis matrix The dimension of total quality management that is *"customer focus"* significantly accounted for the variation of 6.37% in the innovation performance. Hence, it is proved that the hypothesis (H_9) is accepted, and there is a significant and positive moderate level of association between customer focus and innovation performance of DIBP.

H_{10}: Continuous improvement is associated with innovation performance.

The highly significant and positive relationship was enunciated in the correlation analysis test between one of the TQM practices that is continuous improvement and innovation performance as the correlation coefficient was (r = 0.299, $p < 0.01$).It is inferred that the hypothesis (H_5) is accepted, and it is proved that continuous improvement is significantly and positively associated with innovation performance of DIBP.

H_{11}: Employee involvement is associated with innovation performance.

The correlation analysis showed that there is a highly significant and positive relationship between employee involvement and innovation performance as the correlation coefficient was (r = 0.232, $p <$ 0.01). Meanwhile, the results of ordinary least square regression analysis identified the positive standardized beta (β) value (β = 0.232, $p < 0.05$). The value of F statistics was (F = 12.71, $p < 0.05$) significant which also showed the positive relationship and illustrated that the model was fit, and also the significant t-value was (t = 3.565). The dimension of total quality management that is *"employee involvement"* significantly accounted for the 5.0% of variation in the innovation performance. Hence, it is concluded that the hypothesis (H_{11}) is finally accepted, and there is a positive and significant association between employee involvement and innovation performance of DIBP.

H_{12}: Process management is associated with innovation performance.

The outcomes of correlation analysis evaluated that there is a highly significant and positive relationship (r = 0.313, $p < 0.01$) exists between the process management and innovation performance of DIBP as shown in the correlation matrix. The dimension of total quality management that is *"process management"* significantly accounted for the variation of 9.4% in the innovation performance of DIBP. So, it is inferred that the hypothesis (H_{12}) is accepted, and proved that process management is significantly and positively associated with innovation performance of DIBP.

The study has fulfilled the stated objectives of this research work successfully and investigated the association between the TQM practices and organizational quality and innovation performance of DIBP. And also evaluate the impact of TQM practices on the quality and innovation performance of banking organizations. The current research study found that all the TQM practices which include top management commitment, customer focus, continuous improvement, employee involvement, and process management are significantly and positively associated with the quality performance and innovation performance of DIBP. And also the study identified that all the TQM practices collectively have positive and significant relationship with quality performance as also founded by the research

work of (Hassan et al., 2012, Talib et al., 2013) and innovation performance (Zehir et al., 2012) of DIBP as illustrated by the correlation and regression analyses results. Overall the TQM practices contribute 15.2% of variation in quality performance and 10.3% of variation in innovation performance.

Since the current study identified the positive relationship of all the total quality management practices with banking organization's quality and innovation performance. So, the DIBP which are seeking to ameliorate their quality need to ensure the implementation of all the TQM practices in their work settings and processes. The commitment of top management towards quality is so significant to improve quality of service because the other quality management practices will be implemented in a good manner, if the leadership will be committed towards quality (Anupam et al., 2000, Baidoun, 2004, Dering, 1998, Kanji, 2002, Lau and Idris, 2001, Parzinger and Nath, 2000, Zairi, 1999). Secondly as the findings of this study shows that the banking organizations must have to more focus on their customers, their needs and expectations in order to ameliorate their quality performance as this study results give evidence of high value of correlation and proved that there is high level of impact of customer focus on the quality performance(Zehir et al., 2012).

Moreover, the other TQM practices which include employee involvement (Zehir et al., 2012), process management (Prajogo, 2005, Zehir et al., 2012), and continuous improvement are also significantly positively correlated and have positive impact on the quality performance of DIBP, and also these all TQM practices were accounted for contributing different level of variations in the quality performance of DIBP. On the other hand the DIBP which are seeking to get more innovative must have to ameliorate the implementation of TQM practices across their work settings. This study investigated the higher positive relationship between process management and innovation performance, which entails that the improvements in managing all the processes of bank's working adds more amelioration in innovation performance. Also the other total quality management practices such as top management commitment (Prajogo and Sohal, 2001), continuous improvement (Jha et al., 1996), and employee participation (Goetsch and Davis, 2006, Noe et al., 2000, Prajogo and Sohal, 2001, Prajogo and Sohal, 2003, Prajogo and Sohal, 2004), have highly significant correlation and also have significant positive impact on the innovation performance of DIBP. But the other TQM practice customer focus has the smaller value of correlation coefficient and has low impact the on innovation performance of DIBP as compared to other TQM practices.

The results of this study are aligned with the findings of previous studies (Cho and Pucik, 2005, Prajogo and Brown, 2004, Prajogo and Sohal, 2003, Sadikoglu and Zehir, 2010, Wilkinson et al., 1998, López-Mielgo et al., 2009, Prajogo, 2005) as these studies investigated the significant and positive relationship between these TQM practices and the quality performance in manufacturing as well as service sector. Moreover, the studies also found the significant and positive relationship between these TQM practices and innovation performance (Hung et al., 2011, Juran, 1988, Sadikoglu and Zehir, 2010, Martínez-Costa and Martínez-Lorente, 2008, Cooper, 1998, Westphal et al., 1997, Yamin et al., 1997) in the manufacturing and service sector. So, the outcomes of the current research study are supported by the previous research studies.

The current study investigated the impact of five identified TQM practices on the organizational performance of DIBP in terms of quality and innovation. The future research can be done by involving more TQM practices and investigate their impact on other types of organizational performances like ROI, financial performance, business performance, and also the non-financial performance etc. The new study can increase the sample size in order to get more generalizability of the study. The future study can use more advances statistical software to run the regression and correlation analysis like AMOS etc. and can use structural equation modeling (SEM) technique to investigate the effects of variables of study. The prospected study can also include other service sectors like telecommunication sector, hospitality and information technology sector.

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