Evaluating the Deming Management Model of Total Quality in Telecommunication Industry in Pakistan – An Empirical Study

Muhammad Asif Khan

Assistant Professor, Department of Business Administration

Fatima Jinnah Women University, Rawalpindi, Pakistan

Tel: 92-51-5598-305   E-mail: aghaasifkhan@hotmail.com

Abstract

The study investigates the total quality management dimensions, based on Deming Management Model, in telecommunication industry in Pakistan. Questionnaire and semi structured interview were used to collect data from random sample of 400 executives and managers of Cellular Mobile Telephone Operators. Regression analysis indicated that these organizations implement total quality management practices. The findings suggest that an integrated approach is required to implement the total quality management practices in order to realize strategic quality objectives. The study extends the applicability of the Deming Management Model to a new industry and country. Collectively, the results of the research provide more nuanced understanding of issues relating to quality management in developing countries and a framework for enhancing organizational effectiveness.

Keywords: Total quality management, Service quality, Deming management model, Pakistan

1. Introduction

With emergence of total quality management philosophy, visionary companies in Pakistan initiated individual efforts to pursue this new philosophy for sustainability. A comprehensive review of literature indicated that the research on TQM in Pakistan has been focused primarily on individual firms especially in the manufacturing sectors. In service sector, however, the main focus has been in the field of education covering selected educational institutions. Little research has been conducted in this field in other services, especially in the Telecommunication (Telecom) Sector; that is progressing at a galloping pace.

The mobile service was introduced in Pakistan in 1990. During the last ten years, the sector has witnessed a phenomenal growth ranging from 100% to 150% during 2003-2006. Presently the subscribers' base has increased to more 95 million and expected to increase in coming years. Business Monitor International (2010) indicated the growth potential of cell phone market in Pakistan and estimated that by 2013, the mobile subscribers are expected to reach 157.1 million and a penetration rate of 89%.

Pakistan Telecom Authority (PTA) had been carrying out periodic quality of service surveys of Cellular Mobile Telephone Operators (CMTOs). According to these surveys, the quality of service of CMTOs showed improvement. However, the quality of service stills needs further improvement. CMTOs have business excellence, meeting and exceeding customers' satisfaction, exceeding employees' expectations, continuous improvement, and relationship with stakeholders as core elements of their vision and values. There is, however, a gap between the commitment of CMTOs and its manifestation in tangible dimensions based on the quality of service benchmarks identified by PTA. The failure of CMTOs to meet quality of service standards is, therefore, a cause of concern for regulators, customers, and the organizations. This study has provided an opportunity to examine this gap and furnish an objective assessment about the problem.

The objective of the study is to assess the total quality management practices of CMTOs and suggest measures for improving their competitiveness. The study was undertaken to address the lack of empirical findings concerning application of fundamentals of total quality management within Cellular Mobile Industry (CMTOs) in Pakistan.

The results will provide an objective insight to CMTOs to plan necessary course of action to achieve and sustain quality based competitive advantage. The study will generate information that will be useful for organizational leaders in evaluating TQM practices in their own organizations, in Pakistan, using Deming Management Model to enhance organizational performance.

The study will offer quality management researchers with evidence of empirical testing of Deming Management Model in different cultural context, thereby providing universal applicability of this theory. The study would add to the continued efforts toward theory building, refinement, wider applicability, and provide support in consolidation of knowledge.

2. Literature Review

The contemporary quality management philosophy has been strongly influenced by the thoughts of Deming, Juran, Crosby, Feigenbaum, and Ishikawa. Deming (1986) 14 points, Juran (1988) trilogy and 10 steps, Crosby 14 steps to quality improvement, as identified by Brocka and Brocka (1992), and Feigenbaum (1983) approach of total quality control are essential elements of a quality strategy. The holistic approach to quality management is vital for competitiveness.

Deming Management Model is based on the theory of Deming that was formulated by Anderson et al, (1994). Deming Management Model encompasses the TQM philosophy articulated in a prescriptive set of 14 points. Coupled with these 14 points in the Deming Management Model are seven deadly diseases that inhibit firm's performance and many obstacles that impede realization of quality objectives of organization. The 14 points in Deming Management Model are essential statements, which lay down the foundation and action plan for intra-organizational and inter-organizational behaviour. Adoption of these 14 points offer organizations with requisite strength and energy and provide cure for the seven deadly diseases and facilitate organizations to overcome obstacles in achieving performance excellence.

The framework of Deming Management Method expresses effectiveness of the model through concerted leadership efforts toward establishment of cooperative and learning organization systems that facilitates achievement of efficient process management. The realization of process management practices enables organizations to achieve customer satisfaction through continuous improvement and employee fulfillment. The theoretical framework based on the seven constructs expressing Deming Management Method is shown in Table 1.

In a subsequent study, Anderson et al., (1995) empirically validated Deming Management Method. Subsequently this was used in empirical studies (Rungtusanatham et al., 1998; Fisher et al., 2005; Douglas & Frendendall, 2004; Singh et al., 2007). The results illustrated strong support for all hypotheses of Deming Management Method. Anderson et al., (1994) emphasized the need to undertake vigorous testing of the theory to confirm its generalizability, and applicability across sectors, countries, industries, employee groups and time periods. Other researchers also argued that refinement efforts through testing of this theory would contribute toward better understanding, and assist in knowledge consolidation (Sousa and Voss 2002). Other researchers also argued for further testing the theoretical model in different contexts *(Rungtusanatham* et al., 1998; Fisher et al., 2005).

Sue and Hsu (2002) studied the implementation of quality management practices in 39 telecommunication organizations in Taiwan. The study noted poor training of the staff and weak suppliers' management as the vital dimensions of quality management for superior performance.

Tsang and Antony (2001) identified critical success factors of TQM in UK services organizations including telecommunication. Based on the study of 300 subjects, the study identified top management commitment, customer focus, training and development, teamwork, continuous improvement, supplier partnership, and cultural change as essential dimensions of TQM. Patel and Djerdjouri (2000) examined the implementation of TQM practices in Telecom Fiji. The results of the study indicated a change in organizational culture, improved processes and productivity, improvement in management and employee relations, and increased employees' commitment. There was a considerable improvement in team based approach, which resulted in increased efficiency and effectiveness, and considerable savings were made in the labour costs. A considerable improvement in processes was also experienced. Antilla (2000) investigated the impact of TQM implementation in Sonera Corporation, a leading Finnish Telecommunication Company. The results indicated significant improvement in profitability and customer base because of effective leadership, learning of employees, increased innovations of products, services and processes, and change in organizational culture.

3. Development of hypotheses

Deming Management Method Model has identified eight constructs. To develop hypotheses, these seven constructs are examined separately to explore various dimensions underlying these constructs. Review of literature in services and telecommunication industries has been done to find support for these constructs.

3.1 Visionary Leadership

Visionary Leadership encompasses the role of top management in defining a vision, mission, strategic objectives, and shared values for the organization's growth and development. In quality management context, the visionary leaders need to emphasize the importance of transformation through open communication to achieve a shared approach to the change.

Quality Gurus stressed that leadership is vital for effective implementation of total quality management initiatives. Zairi (1994) argued that in TQM environment, leaders focus on employee autonomy, recognition, coaching, and development. Rao et al., (1999) noted that top management is responsible for quality leadership and providing support to achieve superior performance. Pierce and Niewstrom (2000) highlighted the importance of leadership in the process of ascending to world-class status, and emphasized the need for leadership to establish a high-performance culture, high-performance delivery processes and services in support of this objective. Anwar (2003) concluded that Vodafone spectacular growth and entrepreneurial culture is attributed to its visionary leadership and senior management involvement. Based on extensive studies, researchers have concluded that leadership and top management commitment is the most critical and crucial prerequisite for institutional success when implementing TQM (Collier & Esteman, 2000; Dale 2003; Pun & Hui 2002).

3.2 Employees Collaboration (Internal Cooperation)

Internal cooperation manifest itself into teamwork, unity of purpose, mutual trust and respect for all, participation at all levels and shared approach throughout the organization. This cooperation creates synergy and facilitates superior individual and team performance that affects the success of quality initiatives in the organizations. Deming (1993) focused on teamwork and collaboration and argued against competitive behaviour. Oakland (1989) established that teamwork builds up trust, improves communication, and develops interdependence. Katzenbach & Smith, (1994) concluded that through integrated efforts and problem solving, teams can achieve higher results. Woods, (1997) established that the essential factor for the success of quality management is team based work environment. Vodafone (2006) development programmes for managers include team oriented engagements, creating cooperative culture to achieve strategic goals. Bharti Airtel (2007) values teamwork that forms an integral part of its strategy.

3.3 Suppliers Relationship (External Cooperation)

In TQM environment, suppliers become strategic partners. The suppliers' interaction with customers provides opportunities for improvement of products, services, and processes. Rao et al., (1999, p. 1052) noted that "quality-oriented companies pursue a proactive strategy in developing long term relationship with suppliers and provide support to enhance the quality of their suppliers." Evan and Lindsay (2002, p. 99) found that a "reduced supply base decreases the variation coming into the processes, thus reducing scrap, rework, and the need for adjustment to accommodate this variation." Slaight (1999) opined that through effective suppliers' relationship, telecommunication companies can reduce procurement cost by 10% to 15%. Ravi (2007), noted that Bharti Airtel (India's largest mobile company), focuses on long-term relationship with its suppliers that could provide differentiated and customized services to achieve cost competitiveness. Vodafone (2006) noted that partnerships with their suppliers are essential to their mutual success. In research of three case studies from European telecommunications companies, Wright et al., (2002) noted that customer relationship management provides strategic advantage in responding to the market trends.

3.4 Learning

Organization learning entails organization's willingness and ability to learn from its environment, experiences, failures and successes through a continuous process of organization wide examination and analysis. Learning practices promote creativity, acknowledge open arguments, reward experimentation and enhance personal and team efficiency and effectiveness. According to Deming (1986), learning is a continual process for the purpose of expanded knowledge with its own merit. Organizations' willingness to engage in learning is critical to process management. Barret (1999) noted that learning culture fosters innovative thinking and collaborative system. Senge (1990) argued that successful organizations innovate and learn. He concluded that superior performance depends on learning. Huq and Martin (2000 p. 97) identified that "education and training of workforce is the basic quality principle." Roth and Jackson (1995) considered operational competence of service firms as their organizational knowledge. Vodafone (2006) noted that provision of training helped employees reach their full potential and benefited the organization. Telenor (2006) experienced positive impact of training and development on individuals and the organization to create value for customers. China Mobile (2007) reaffirmed its commitment to building a learning organization and continuous efforts have been made to enhance its training.

France Telecom (2006) found skill development as a mean of meeting innovative growth services in future. SingTel (2006) asserted that staff development is a significant component of the Group's human resources strategies.

3.5 Process Management

Process management entails use of information, competencies, means, procedures and systems to define, visualize, measure, control, report, and improve the processes. The ultimate goal is to meet customer requirements and improve customer satisfaction. In TQM context, process improvement is achieved through use of statistical techniques, change of process and eliminating those steps that do not add value to internal or external customers. Process owners play an important role in effective process management. Quality function deployment (Akao,1990); Taguchi methods (Taguchi, 1979); Shingo's error proofing techniques; and seven new quality control tools are important techniques for improving processes, products, and services designs. Shortell et al, (1995) found that process management facilitates evaluating continuous quality improvement programmes. Kunst and Lemmink (2000) established positive relationship of process management and customer and employee satisfaction related programmes. China Mobile (2006) asserted that through process improvement, the company has enhanced its capability to plan and implement management innovation and technical innovation. Telemex (2006) found that research and development activities in process improvement initiatives affected organizational performance. British Telecom (2002) faced a major problem of how to manage, sort, approve and process employees' ideas so that these could be evaluated and implemented efficiently. The management of process yielded cost reduction, customers' satisfaction and rapid response.

3.6 Continuous Improvement

The concept of continuous improvement implies constant improvement in the processes, products and services. Deming (1986) stressed the organizations to improve continuously the products and services. Anderson et al. (1994) identified that continuous improvement is based on process management practices that yield incremental improvement and innovations in products, services, and processes. Juergensen (2000) viewed continuous improvement as an initiative that enhances success and decreases failures. Bessant, et al., (1994) found it as a process of continuous incremental innovation. Vodafone (2006) encourages employees to challenge the existing procedures to improve business processes through monitoring and reviewing the performance indicators. Telenor (2006) continues to challenge itself to improve internal standards, the way it works with partners, and to manage the impact of its services and operations. China Mobile (2006) strives to improve customer services and enhance organizational ability to meet customer needs and improve customer privacy policies and procedures.

3.7 Employee Fulfillment

TQM transformation needs employees' involvement as management philosophy and must manifest in all organizational activities. This is exemplified in involving employees in quality of work life initiatives, participatory management, and other employee related programmes. Gronroos (1983) recognized that employees' involvement with emphasis on independence, creativity and self control is vital in developing service oriented approach in the workforce. Oakland (1989) concluded that employees are a source of ideas and their competency need to be harnessed to transform these ideas into reality. Deming (1986) and Feigenbaum (1983) strongly supported employees' participation in decision making. Researchers and quality experts have concluded that employee fulfillment is a multidimensional concept based on employees' total satisfaction from work environment and manifests in job satisfaction, pride of workmanship, commitment, continuous learning and innovation, and results in enhanced quality of product, processes, and services to the customers (Locke, 1976; Mitchell, 1979).

Telekom Austria (2006) noted that informed and engaged employees are essential for business to operate effectively and engaging them for feedback is vital to the success. DoCoMo (2006) developed organizational climate that fosters individual respect and creates opportunities for development of their competency. TeliaSonera (2007) emphasized that their values guided the employees to contribute in decision making during its transformation from technology-oriented company to customers focused company.

3.8 Customer Satisfaction

Customer satisfaction is at the heart of TQM philosophy. A proactive approach to responding to changing customer' needs are vital to attract and retain customers. By close interaction with customers, organizations can determine customers' changing requirements, trends and use them as yardstick with their competitors (Vavra, 2002). Parzinger and Nath (2000, p.356) clearly stated that "in TQM environment the job is not done until the

customer is satisfied."Anderson et al., (1994) noted that customer satisfaction is exemplified by customer-driven focus. Literature review highlights that internal quality practices of organizations affect customer satisfaction (Nilsson et al., 2001). The research found that worker awareness and mindset is positively related to customer satisfaction. Improved customer satisfaction in services leads to higher customer retention (Rust et al.,1995).Chou and Chang (2006, p.175), in a case study of Chine Mobile, found that "perceived expectations, perceived quality, perceived value, perceived usefulness, and perceived ease of use were critical factors for customer satisfaction with mobile services." Telefonica (2006) acknowledged that customer promise charter is the cornerstone of its strategy and challenge employees to provide the best services to the customers to make them happier and loyal. France Telecom (2006) views customer satisfaction as the foundation of its growth and places customer satisfaction on top priority through setting high standards of services and maintaining the trust in the brand. TeliaSonera (2007) emphasized that it creates value for each customer through customization and transforming customer related information into actions. In a case study of mobile phone users in India, Mohanty and Das (2007) found that better network, superior customer care and high quality are vital for users' satisfaction. Do Co Mo (2006) highlighted that meeting needs of customers is company's top priority.

Based on the study of literature, following hypotheses emerge:

H 1. Visionary leadership has positive relationship with internal cooperation.

H 2. Visionary leadership has positive relationship with external cooperation

H 3. Visionary leadership has positive relationship with learning.

H 4. Internal cooperation has positive relationship with process management.

H5. External cooperation has positive relationship with process management

H 6. Learning has positive relationship with process management.

H 7. Process management has positive relationship with continuous improvement.

H 8. Process management has positive relationship with employee fulfillment.

H 9. Continuous improvement has positive relationship with customer satisfaction.

H 10. Employee fulfillment has positive relationship with customer satisfaction.

4. Methods

4.1 Instrument Development

The constructs underlying the Deming Management Model were operationalized using previous published scales (Anderson et al., 1995; Rungtusanatham et al., 1998; Fisher et al., 2005). The scale originally developed by Anderson et al., (1995) was modified by Douglas and Fredendall, (2004) for research in the services based on Deming Management Model. The present study used the questionnaire developed by Douglas and Fredendall (2004). For measuring the customer satisfaction, the scale applied by Anderson et al., (1995) has been used in the present study. Five points Likert rating scale ranging from strongly agree (5) to strongly disagree (1) was adopted for the study.

4.2 Pilot Testing of Instrument

To validate the instrument, a sample of 55 executives and managers was used in the pilot testing. The Cronbach's alphas ranged from 0.698 to 0.90 for different variables. The results of pilot study indicated the adequacy of the instrument as recommended by were (Nunnaly, 1978).

4.3 Sample and Data Collection

Five Cellular Mobile Telephone Operators with 99% of market share were selected for this study. All employees of these organizations were the target population. The population comprised of executives and managers at all levels. Simple random sampling had been used since the dimensions of total quality management involves everyone in the organization, each subject was considered to be in a suitable position to provide reliable information and valid data on quality dimensions being practiced. The survey had been administered to 400 participants using different means (email, personally delivered and through third party). A complete set of questionnaire including a covering letter accompanied the questionnaire. A total of 300 filled questionnaires were received, which represented 75% response rate. Out of these, 290 filled questionnaires were found in order and were used in analysis of the data. Semi structured interviews of 20 managers were conducted. These managers represented different functional areas of the CMTOs.

4.4 Validity of Instrument

The content validity of the instrument of this research has been well established by quality experts and researchers (Brocka & Brocka, 1992; Evans& Deans, 2003; Oakland, 1989). In addition different studies have used the measuring scales and validated the items of the instrument (Ahire et al.1996; Quazi et al.1998; Rao et al.1999; Saraph et al.1989). The content validity of the instrument of this study was established using two methods. For face validity, the instrument was presented to a panel of four quality experts who approved that the items measure the concept. In the second step, the questionnaire was given to a few managers and other executives working in CMTOs to ensure that the participants understand the items in the questionnaire. The response was affirmative and no ambiguity was experienced in understanding the items in the instrument. For construct validity, confirmatory factor analysis was undertaken for this study to validate the factors used in the instrument

4.5 Data Analysis

Both descriptive and inferential statistics has been used to analyze the data. Statistical Package for Social Sciences (SPSS-version 16) and AMOS (16.0) software have been used in the analysis.

4.6 Results and Analysis

4.6.1 Results of descriptive statistics

All the constructs drew general agreement with regard to the responses. Visionary leadership (*Mean* = 4.03, *Standard Deviation* = 0.642); internal cooperation (*Mean* = 3.86, *Standard Deviation* = 0.676); external cooperation (*Mean* = 3.61, Standard *Deviation* = 0.660); learning (*Mean* = 3.44, *Standard Deviation* = 0.628); process management (*Mean* = 3.82, *Standard Deviation* = 0.662); continuous improvement (*Mean* = 4.16, Standard *Deviation* = 0.669); employee fulfillment (*Mean* = 4.38, Standard *Deviation* = 0.524); and customer satisfaction (*Mean* = 0.432, Standard *Deviation* = 0.354) reflect concurrence. The results, based on mean score and standard deviation, reflect respondents' general agreement to the dimensions of the model.

4.6.2 Results of reliability and validity of data

Cronbach's alpha for instrument (47 items) was 0.898. The Cronbach's alpha for individual variables of visionary leadership (0.853); internal cooperation (0.865); external cooperation (0.836); learning (0.908); process management (0.911); continuous improvement (0.842); employee fulfillment (0.675); and customer satisfaction (0.686) indicated that the measure is compositely reliable and internally consistent as recommended by Nunnaly (1978).

4.6.3 Results of test of normality of data

The results of multicollinearity analysis indicated that Tolerance levels (< or equal to 0.01) and Variation Inflation Factor (VIF) value (below 10) are within acceptable range. The values of Durbin Watson for all variables are also within limits ((between 1.5 and 2.5). The tests exhibit that multicollinearity problem does not exist.

4.6.4 Results of factor analysis

For construct validity, confirmatory factor analysis was conducted to validate the underlying structure of the model. Prior to the conduct of confirmatory factor analysis, Kaiser-Meyer-Olkin (KMO) static and Bartlett's Test of Sphericity was performed. The KMO value (KMO = 0.924) indicated that the degree of common variance among the seven variables was marvelous (Malhotra, 2004).   The Bartlett's test of sphericity indicated a Chi square 6.910 with an observed significance level of p< .001. Based on the results, it was inferred that the relationship between the variables was strong and appropriate for factor analysis. These factors explained 69% of variance.

4.6.5 Results of Correlation Analysis

To determine the relationship between variables, correlation analysis was done. Table 2 indicates that all factors have positive and significant relationship. Results reflect that the correlation between variables is significant (p< 0.001).

4.6.6 Results of Regression Analysis

The result of regression equation based on path analysis is reflected in Table 3**.** The variable of visionary leadership positively and significantly predicts internal cooperation, F (1, 288) = 176.733, p < 0.01, Beta = 0.642, p< 0.01, R Square = 0.412; external cooperation, F (1, 288) =158.929, p < 0.01, Beta = 0.622, p< 0.01, R Square = 0.387; and learning, F (1, 288) =168.877, p < 0.01, Beta = 0.608, p<0.01, R Square = 0.370. The results

visionary leadership's commitment to the total quality management creates enabling environment in the organization and fosters internal cooperation among employees; external cooperation with suppliers and nurture and promote continuous learning.

Process management was regressed on predicting variables of internal cooperation, external cooperation and learning. The combination of these variables significantly predicts process management, $F_{(2, 287)} = 220.826$, $p < 0.01$, which highlights that internal cooperation (Beta = 0.205, $p < 0.01$) and external cooperation (Beta = 0.222, $p < 0.01$) create a collaborative environment that facilitate improvement in processes. Similarly learning enhances the skills and abilities of the workforce and provides them with opportunity to experiment and improve the processes (Beta = 0.488, $p < 0.01$). The R Square = 0.636 depicts that these variables explain more that 63% of variance in the process management.

Process management positively and significantly predicts continuous improvement, $F_{(1, 288)} = 190.865$, $p < 0.01$, Beta = 0.631, $p < 0.01$, R Square = 0.399; and employee fulfillment, $F_{(1, 288)} = 13.191$, $p < 0.01$, Beta = 0.209, $p < 0.01$, R Square = 0.044.

Customer satisfaction was regressed on predicting variables of continuous improvement and employee fulfillment. The combination of these variables significantly predicts customer satisfaction, $F_{(2,287)} = 73.857$, $p < 0.01$ and (Beta = 0. 034, $p < 0.01$) for continuous improvement and (Beta = 0 .555, $p < 0.01$) for employee fulfillment. The R Square = 0.340 depicts that these variables explain 34% of variance in the customer satisfaction.

5. Discussion

The main objective of the study was to empirically examine the TQM practices in CMTOs in Pakistan. The results of the study provided strong empirical support to the Deming Management Model. The path analysis also provided empirical evidence for the support of the theoretical relationship proposed in 10 hypotheses.

The crucial role of visionary leadership in pursuing company wide quality policies has been well established. Visionary Leadership pursues a partnership with employees, customers, and other stakeholders. The study indicated positive and statistically significant relationship with internal customers, external customers, and learning. Kanji and Moura (2001) acknowledged that outstanding leaders can contribute heavily to total quality by creating inspiring innovative environment. Easton (1993) identified strengths of senior management in areas of unwavering commitment to quality. Quality pioneers and contemporary researchers have found that visionary leadership is the driver of planning, implementing and sustaining total quality management practices in organizations. (Deming, 1986; Juran 1988; Pun, 2001; Saraph et al., 1989; Zhang , 2000).

Internal Cooperation through teamwork is vital to achieve TQM objectives. Teams create synergy, cohesion and enhance shared approach toward achievement of quality objectives through functional integration, and striving for continuous improvement resulting in high individual and team morale. The results indicate positive and statistically significant relationship with process management. Teamwork has been praised as the key to successful TQM institutions (Lycke, 2003). Blanchard et al., (1996) established that team commitment leads to innovative ideas and improvement in processes. Oakland and Oakland (2001) identified teamwork as one of the core activities in award winning companies. Stevenson (1996) attributed superior financial and non-financial to different types of teams in quality environment.

Suppliers are viewed as partners and this relationship is based on strategic orientation, win-win-philosophy and mutual trust. The results highlight positive and statistically significant relationship with process management. Frey et al., (1993) argued that relationship with suppliers yields multifaceted strategic benefits. Lascelles & Dale (1989) established that partnership with suppliers yields cost competitiveness, increased organizational response to changing needs of markets and improve organizational processes.

Institution of quality focused training philosophy improves individual confidence and self esteem, enhances pride of work, inculcates team spirit, focuses on continuous improvement, and aligns organizational processes to changing customers' needs. The study finds positive and statistically significant relationship with process management. According to the research studies, training is vital for generating awareness and commitment to quality policy and strategy (Palo & Padhi, 2003), promoting a caring culture and building quality related competence (Caudron, 1933), and facilitate building teams to achieve quality management goals (Wilsey, 1995).

The methodical and behavioural dimensions of process management yield significant results in value addition, maximizing operational effectiveness, continuous improvements in products and services consistently for competitiveness. The results of the study indicate positive and statistically significant relationship with continuous improvement and employee fulfillment. Evan and Lindsay (2002) established that effective process

management leads to enhanced customers and employees' satisfaction. Sinclair and Zairi (2001) noted that process management is required to continuously improve operations. Douglas and Fredendall, (2004) established that process management significantly contributes toward continuous improvement and employee fulfillment.

Continuous improvement is one of the essential factors in TQM success. Rapid changes in technology and customers' requirements require a flexible approach toward aligning organizational products, processes and services to meet and exceed ever changing customers' needs. The results highlight positive and statistically significant relationship with customer satisfaction. Gallagher et al., (1997) concluded that this approach leads to creativity and competitive excellence. Kossoff (1993) argued that TQM objectives can be accomplished by constantly pursuing continuous improvement.

Employee fulfillment manifest in individual's job satisfaction, job commitment and the pride of accomplishment of products, services quality, and possession of knowledge for initiating improvement in processes. This is also exemplified in successful engagement in learning and application of this knowledge to enhance personal and organizational development. The study found positive and statistically significant relationship with customer satisfaction. Sureschandar et al., (2001) found evidence of strong relationships between employee perception of employee well-being and customer perception of service quality and satisfaction. Parasuraman et al., (1985) found positive and significant relationship between employees' perception and attitude and customer satisfaction. Rienzer and Testa, (2003) acknowledged that the benefits for internal customers' satisfaction (employee satisfaction) provide greater support for continuous improvement. Afors and Michaels (2001) concluded that satisfied employees produce satisfied customers.

The policy of benchmarking best practices of other organizations is not followed by CMTOs. In addition, use of self evaluation is not done that deprive the organizations to identify the organizational strengths and weaknesses enabling CMTOs to initiate appropriate strategies to improve weak areas in quality management.

The study reveals that Deming Management Model is applicable in a different cultural environment. The Model can help organizations to evaluate their quality management practices, identify the gaps, plan and implement appropriate improvement initiatives to achieve quality goals and sustained competitive advantage.

A fundamental assumption in virtually all of the quality management literature is the interdependence of the total quality management practices (Ahire et al., 1996; Choi & Eboch, 1998; Saraph et al., 1989). This assumption of interdependence implies that it is the joint variance of the quality practices that creates superior quality performance. This study reflects that interdependence of these practices in an integrated manner is essential to realize TQM objectives. This study finds that all the relationship among total quality management practices is statistically significant and the model provided empirical support about relationship among total quality management practices.

The results of this research reflect marked similarity with previous studies on Deming Management Model (Anderson et al. 1995; Douglas & Fredendall 2004; Fisher et al. 2005; Rungtusanatham et al.1998).

The findings of this study highlight the important role of the leadership in driving the total quality management practices in CMTOs. The findings supported the studies regarding the dominant role of leadership in planning and implementing TQM practices (Pun & Hui, 2002; Tata & Prasad, 1998; Singh et al., 2007; Yusof & Aspinwall, 2000, Zairi, 1994).

It is important to note that some practices such as visionary leadership, internal cooperation, external cooperation, learning, and process management must work through the total quality management system to influence the desired results. The findings support the idea that effects of visionary leadership on customer satisfaction is dependent on creating and sustaining a quality focused organizational culture (Waldman & Gopalakrishnan, 1996).

6. Research Limitations and Further Research

6.1 Limitations of the Study

The present study has some limitations that offer opportunities for future research. The data is based on individual opinion, which may bring in some bias. The customer satisfaction data has been obtained from the respondents rather than customers. Since the data is not based on an external measure of this dimension, the responses are likely to be biased and may not provide a realistic evaluation of customer satisfaction. Deming Management Model is applied to one industry in this study. To establish the generalization of the Model within the context of Pakistan, it needs to be tested in other industries setting, both in public and private sectors.

6.2 Future Research

The success of TQM practices depend on a supporting organizational culture. In Pakistani business environment, the cultural dimension becomes even more important for the success of TQM initiatives. The response to TQM initiatives in different cultural context has been studied. There is a need to further study the cultural dimensions of CMTOs and other Pakistani organizations and its compatibility to TQM philosophy, identifying the bottlenecks for adaptation of this philosophy of change and initiating the required response to enhance organizational competitiveness.

The phenomenal growth of Cellular Mobile Industry offers challenges and opportunities for organizations to meet the rising numbers of subscribers. The perception of quality of service of CMTOs needs to be objectively explored purely from customers' perspective. There is a need for further study in this area to determine the quality of service of these organizations through an external measure.

Deming Management Model has been found to be useful in all cultural contexts. There is a need to use this model in other industries in Pakistan to validate the findings of this study.

The model also offers opportunities for its further development based on the study and exploration of additional paths. This would further refine the theory based on the Deming Management Model.

In order to manage quality dimensions effectively, identification of barriers in planning and implementation of TQM practices is essential in Pakistani organizations. This aspect should be investigated with a view to adopt a proactive response strategy to eliminate these barriers to realize the objectives of TQM practices.

7. Implication for Managers

The results of the study provide essential guidelines for administrators and managers in dealing with quality management and continuous quality improvement initiatives in the organizations. Telecommunication Industry in Pakistan is a growing and vibrant industry and findings of this research will help managers to comprehensively focus on total quality management practices to remain competitive.

The significant role played by the leadership in initiating and sustaining internal and external collaboration; organizational learning, improvement in processes; enhanced continuous improvement and employee fulfillment; and focused approach to customers' satisfaction is significantly important for managers at all tiers in telecommunication and other service industry. This calls for managers to provide necessary leadership, guidance and enabling environment to achieve and sustain quality initiatives in the organizations. A lukewarm response by managers will seriously affect quality management pursuits of organizations.

The processes of self evaluation and benchmarking of best practices provide opportunity to improve the quality of services. Our findings indicate that these aspects are lacking. Concerted efforts are needed to undertake self evaluation of quality management practices to initiate improvements. The benchmarking of best practices in telecommunication industry and other services should be undertaken to achieve superior performance.

The research identified the need for nurturing a learning culture in the organization. The managers provide support for this culture. The emphasis on this issue need to be further strengthened.

People make the quality happen in the organizations. Fulfilled employees make vital contribution in improvement of process and services and ultimately provide a delightful experience to customers. Proactive employee focused policies are needed to exploit the full potentials of employees in realizing quality objectives. CMTOs should focus on employees related policies to provide service excellence, and achieve process improvement.

8. Conclusion

The aim of the study was to examine the total quality management practices of CMTOs in Pakistan. The results have reflected that these organizations implement TQM practices. There is, however, lack of a structured mechanism for self evaluation of these practices. In addition, the practice of benchmarking is undertaken. These organizations need to focus on these important issues to identify gaps, and strive for continuous improvement to achieve competitiveness.

The role of leadership and leaders' active participation in all dimensions of quality management initiatives established in the study offer noteworthy significance to researchers and intellectuals.

The study provides a significant contribution in the application of Deming Management Model to services in a different cultural context. The sound theoretical and empirical support for different variables in the telecommunication industry advocates that researchers and academician should include these dimensions in the

study and research about service quality. The study indicates that Deming Management Model is equally applicable to services and reinforces the belief in the effectiveness of the Model.

This study offers strong evidence of continued significance of quality management as a priority issue for developing countries to remain competitive in domestic and global markets. The results of this research indicate that quality management practices have been well embedded in the managerial practices of organizations in developing countries.

References

Afors, C., & Michaels, M.Z. (2001). A quick, accurate way to determine customer needs. Q*uality Progress*, 34(7) 82-87.

Ahire, S.L., Golhar, D.Y., & Waller, M.A. (1996). Development and validation of TQM Implementation Constructs. *Decision Sciences*, 27(27) 23-56.

Akao, Y. (1990). *Quality function deployment.* Cambridge, MA: Productivity Press

Anderson, J. C., Rungtusanatham, M., & Schroeder, R. G. (1994). A theory of quality management underlying the Deming management method. *Academy of Management Review*, 19(3), 472–509.

Anderson, J., Rungtusanatham, M., Schroeder, R., & Devaraj, S. (1995). A path analytic Model of a theory of quality management underlying the Deming management method: Preliminary empirical findings. *Decision Sciences,* 26*,* 637-658.

Anderson, M., & Sohal, A. S. (1999). A study of relationship between quality management practices and performance in small business. *International Journal of Quality & Reliability Management*, 16 (9) 859-77.

Antilla, J. (2000). Realizing innovatively recognized TQM principles and reference models in a rapidly changing competitive business environment - case Sonera Corporation. [Online] Available: http://www.piqc.com.pk/Casestudies /TQMatSoneraCorporation_Juhani.pdf (August 14, 2008).

Anwar, T. S. (2003). Cases Vodafone and the wireless industry: a case in market e. *Journal of Business & Industrial Marketing,* 18(3), 270-288.

Barrett, F. (1995). Creating appreciative learning cultures, *Organizational Dynamics, Autumn,* 36- 49

Bessant, J., Caffyn, S., Gilbert, J., Harding, R., & Webb, S. (1994). Rediscovering continuous Improvement. *Technovation*, 14 (1), 17-29.

Bharti Airtel. (2007). *Bharti Airtel Report.* [Online] Available: http://www.bhartiairtel in/index.php? Id=261 (January 14, 2008)

Blanchard, K., Carew, D., & Parisi-Carew, E. (1996). *The 01-minute manager builds high performance teams*. Glasgow: Caledonian International Book Manufacturing Ltd.

British Telecom. (2002). *Process Management*. [Online] Available: www.targetfour.com/hd/products/heat/case studies/casestudies_heat_bt.pdf (February 16, 2007).

Brocka, B., & Brocka, M.S. (1992). *Quality Management: Implementing the Best Ideas of the Masters*, Richard D. Irwin, Homewood, IL.

Business Monitor International. (2010). *Pakistan Telecommunication Report.* [Online] Available: http://74.125.132/search?q=cache:fS6swo66NJ8J.www.prlog.org/10623130-newmarket-research-report-pakistan -telecommunicatios-report-q2 2010.pdf (March 23, 2010).

Caudron, S. (1993). Change keeps TQM programs thriving. *Personnel Journal*, 72,104-7.

China Mobile. (2007). *Corporate Responsibility Report*. [Online] Available: www.chinamobile.com/en/mainland/ Corporate/2008csr_en/ (April 20, 2008).

Chou, C.M & Chang, S.C. (2006). Factors affecting China Mobile Customer satisfaction. [Online] Available**:** http://www.decisionsciences.org/Proceedings/DSI2008/ docs/17-9824.pdf (July 15, 2007).

Collier, J., & Esteman, R. (2000). Systematic leadership: ethical and effective. *The Leadership & Organization Development Journal*, 21, 207-215.

Dale, B.G. (2003). *Managing quality.* (4th ed.). Hertfordshire: Prentice Hall.

Deming, W.E. (1986). *Out of the Crisis*, Cambridge University Press, Cambridge.

Deming, W.E. (1993). *The new economics for industry, government, education.* Cambridge: Massachusetts Institute of Technology, Center for Advanced Engineering Study

Do Co Mo. (2006). *DoCoMo Vision.* [Online] Available: http://www.nttdocomo. Com/about/vision/index.html (January 20, 2008).

Douglas, T.J., & Fredendall, L.D. (2004). Evaluating the Deming Management Model of Total Quality in Services. *Decision Sciences,* 35, November, 393-422.

Easton, G. (1993).The 1993 state of US total quality management: a Baldrige examiner's Perspective. *California Management Review,* 35(3), 32-54.

Evans, J.R., & Dean, J.W. (2003). *Total Quality Management, organization and strategy*. United States: Thomson Learning.

Evans, J.R., & Lindsay, W.M. (2002). *The Management and Control of Quality*. (5th ed). South-Western, USA.

Feigenbaum, A.V. (1983). *Total Quality Control*, (3rd Ed) New York, McGraw-Hill.

Fisher, C.M., Barfield, J., Li, J., & Mehta, R. (2005). Retesting a Model of the Deming Management Method, *Total Quality Management*, 16, (3), 401-412.

France Telecom. (2006). *Annual Report.* [Online] Available: http://www.francetelecom. Com/sirius/RA2006/RA_06_UK/appli.htm (August 25, 2007).

Frey, S.C., Jr, & Schlosser, M.M. (1993). Creating value through cooperation. *Sloan Management Review,* 34(1), 65-72.

Gallagher, M., Austin, S., & Caffyn, S. (1997). *Continuous Improvement in Action: The Journey of Eight Companies*. Kogan Page, London.

Grönroos, C. (1983). *Strategic Management and Marketing in the Service Sector*. Marketing Science Institute, Cambridge, MA.

Huq, Z., & Martin, T. (2000). Workforce cultural factors in TQM/CQI implementation in hospital. *Health Care Management Review*, 25(3), 80-103.

Juergensen, T. (2000). *Continuous Improvement: Mindsets, Capability, Process, Tools and Result.* The Juergensen Consulting Group, Inc., Indianapolis, IN.

Juran, J.M. (1988). Juran on planning for quality. Cambridge MA: Productivity Press. *A Life Cycle Approach*, (5th ed) Homewood, IL, Irwin.

Kanji, G.K., & Moura, P. (2001). Measuring leadership excellence. *Total Quality Management,* 12(6), 701-718.

Katzenbach, J.R., & Smith, D.K. (1994). *The Wisdom of Teams,* McGraw-Hill, New York, NY.

Kossoff, L. (1993). Total quality or total chaos? *HR Magazine,* 38(4), 131-4.

Kunst, P., & Lemmink, J. (2000). Quality management and business performance in hospitals: A search for success parameters. *Total Quality Management,* 11, 1123-1133.

Lascelles, D.M., & Dale, B.B. (1989). A review of the issues involved in quality improvement. *International Journal of Quality & Reliability Management,* 5, 76- 94.

Locke, E.A. (1976). *The nature and causes of job satisfaction.* In M.D. Dunnette (ed), Handbook of industrial and organizational psychology: 1279-1349. Chicago: Rand McNally.

Lycke, L. (2003). Team development when implementing TPM. *Total Quality Management*, *14(2)* 205-213.

Malhotra, N.K. (2004). *Marketing Research: An Applied Orientation.* Pearson Education Inc, Upper Saddle River, New Jersey

Mitchell, T.R. (1979). Organizational Behaviour. *Annual Review of Psychology,* 30, 243-281.

Mohanty, S., & Das, B. (2007). Service Usability and Users' Satisfaction in India: An Exploratory Study of Mobile Phone Users. *The Icfai Journal of Services Marketing,* 5(4), 53-66.

Nilsson, L., Johnson, M.D., & Gustafsson, A. (2001). The impact of quality practices on customer satisfaction and business results: product versus service organization. *Journal of Quality Management*, 6, 5-27.

Nunnaly, C.J. (1978). *Psychometric Theory.* McGraw-Hill, New York, NY.

Oakland, J.S. (1989). 'Preface". *Total Quality Management*. Heinemann, Oxford. WI: Center for Quality and Productivity.

Oakland, S., & Oakland, J.S. (2001). Current people management activities in world- class organizations. *Total Quality Management*, 12(6), 773-88.

Palo, S., & Padhi, N. (2003). Measuring effectiveness of TQM training: an Indian study. *International Journal of Training and Development*, 7(3), 203-16.

Parasuraman, A., Valarie A., & Leonard L. Berry. (1985). A Conceptual Model of Service Quality and Its Implications for Future Research. *Journal of Marketing,* 49 (Fall) 41-50.

Parzinger, M.J., & Nath, R. (2000). A study of the relationships between Total Quality Management implementation factors and software quality. *Total Quality Management*, 11(3), 353-371.

Patel, R., & Djerodjour, M. (2000). Implementation of quality programmes in developing countries: a Fiji Islands case study. *Total Quality Management, 11)1),* 25-44

Pierce, J.L., & Newstrom, J.W. (2000). *Leaders and the leader process.* New York: Irwin McGraw-Hill.

Pun, K. (2001). Cultural influences on Total Quality Management adoption in Chinese enterprises: an empirical study. *Total Quality Management,* 12(3), 323-342.

Pun, K., & Hui, I. (2002). Integrating the safety dimension into quality management systems: a process model. *Total Quality Management,* 13(3), 373-391.

Quazi, H.A. Jemangin, J., Kit, L.W., & Kian, C.L. (1998). Critical factors in quality management and guidelines for self-assessment: The case of Singapore. *Total Quality Management* 9 (1), 35–55.

Rao, S.S., Solis, L.E., & Raghunathan, T.S. (1999). A framework for international quality management research: development and validation of a measurement instrument. *Total Quality Management*, 10(7), 1047–1075.

Ravi, C. (2007). Nortel, Bharti Airtel win excellence award at Oscars of Outsourcing. [Online] Available: http://products.nortel.com/go/news detail.jsp? cat id= 8055&oid=100220800&locale=en-us (January 15, 2008).

Rienzer, R., & Testa, F. (2003). The captive consumer no longer exists. Creating customer loyalty to compete on the new deregulated markets of public utilities. *Total Quality Management & Business Excellence*, 14(2), 171-187.

Roth, A. V., and Jackson, W. E. (1995). Strategic Determinants of Service Quality and Performance: Evidence from the Banking Industry. *Management Science,* 41, 1720-1733.

Rungtusanatham, M., Forza, C., Filippini, R., & Anderson, J. (1998). A replication study of theory of quality management underlying the Deming management method: Insights from an Italian context. *Journal of Operations Management*, 17, 77-95.

Rust, R., Zahorik, A.J., & Keiningham, T.L. (1995). *Return on quality (ROQ): Making service quality financially accountable. Journal of Marketing,* 59(2), 58-70.

Saraph, J.V., Benson, P.G., & Schroeder, R.G. (1989). An instrument for measuring the critical factors of TQM. *Decision Sciences*, 20(4*),* 810-29.

Senge, P. (1990). *The Fifth Discipline*. New York: Doubleday.

Shepetuk, A.J. (1991). Is your product development process a tortoise or a hare? *Management Review*, 80(3), 25-27.

Shortell, S., O'Brien, J., Carman, J., Foster, R., Huges, E., Boerstler, H., & O'Conner, E. (1995). Assessing the impact of continuous quality improvement/ total quality management: Concept versus implementation. *Health Services Research*, 30.

Sinclair, D., & Zairi, M. (1995). Performance Management as an Obstacle to TQM. *The TQM Magazine* 7(2), 42-45.

Singh, P.J, Chua, M.W., & Sum, C.C. (2007). Deming management method: Applying theory to public sector organizations and testing refinements. [Online] Available: http://www.ecom.unimelb.edu.au/downloads/nus_symposium/Singh_paper.pdf

SingTel. (2006). Annual Report, 2006-7. [Online] Available: http://home singtel.com/investor relations/annual_Re [prts/default.asp (August 12, 2007).

Slaight, T.H. (1999). Strategic Sourcing: Not a Squeeze Your Vendor Process. *Telecommunication,* 33(3), 59-62.

Sousa, R., & Voss, C. (2002). Quality management re-visited: a reflective review and agenda for future research. *Journal of Operations Management,* 20(1), 91-109.

Stevenson, W.J. (1996). *Production/operations management.* Chicago: The McGraw- Hill Companies.

Sue, C.T., & Hsu, C.M. (2002). T Quality management practices in Taiwan's telecommunication industry. *Measuring Business Excellence*, 6(3), 42-46.

Sureshchandar, G.S., Rajendran, C., & Kamalanabhan, T.J. (2001). Customer perceptions of service quality: a critique. *Total Quality Management,* 12(1), 111-124.

Taguchi, G. (1979). *Introduction to off-line quality control.* Japanese Standards Association. Tokyo.

Tata, J., & Prasad, S. (1998).Cultural and structural constraints on total quality management implementation. *Total Quality Management*, 9 (8), 703-10.

Telefonica. (2008). *Corporate Responsibility Report*. [Online] Available http://publicaciones. Telefonica.com/ mpd/Visor.svc?first_page=4&publication=TELEFONICA-INFORMEANUAL-RC2008&publisher=TELEFONI CA- NFORMEANUAL-EN (March 14, 2009).

Telekom Austria. (2006). *Telekom Austria Annual Report 2006*. [Online] Available: http://ar2006.telekom.at/(August 14, 2007).

Telemex. (2006). Annual Report 2006.[Online] Available_www.telmex.com/mx/esto/pdf/ pt_descarga.jsp? a=annual_report_2006.pdf (April, 18, 2007).

Telenor (2006). *Annual Report 2006*. [Online] Available: http://img.custompublish. Com/getfile.Php/66283..357.aswcwdqdsd/TTL__Annual Report_2006.pdf? return=www.telemed.no February, 15, 2007

TeliaSonera . (2007). *Annual Report.* [Online] Available: http://www.teliasonera.com/about-telisonera/csr/_environment (February 14, 2008).

Tsang, J.H.Y., & Antony, J. (2001). Total quality management in UK service organisations: some key findings from a survey. *Managing Service Quality,* 11(2), 132-141.

Vavra, T.G. (2002). ISO 9001:2000 and customer satisfaction. *Quality Progress,* 35(5), 69-75.

Vodafone. (2006). *Annual Report 2006*. [Online] Available: http://www.vodafone.com /start/responsibility_uk.html (May 14, 2007).

Waldman, D.A., & Gopakakrishnan, M. (1996). Operational, organizational, and human resource factors predictive of customer perceptions of service quality. *Journal of Quality Management,* 1(1), 91-107.

Wilsey, M.D. (1995). Leadership and human motivation in the workplace. *Quality Progress,* 28(11), 85-88.

Wood, M. (1997). The notion of the customer in Total Quality Management. *Total Quality Management*, 8(4), 181-191.

Wright, L.T., Stone, M., & Abbott, J. (2002). The CRM imperative: practice vs theory in the telecommunications industry. *Journal of Database Marketing,* 9, 339–49.

Yusof, S.M., & Aspinwall, E. (2000). Critical success factors in small and medium enterprises: survey results. *Total Quality Management,* 11(4/5&6), 448-462.

Zairi, M. (1994). Leadership in TQM Implementation: some case examples. *The TQM Magazine,* 6(6), 9-16.

Zairi, M., & Sinclair, D. (1995). Business process re-engineering and process management: a survey of current practice and future trends in integrated management. *Management Decision*, 33(3), 3-16.

Zhang, Z. (2000). Developing a model of quality management methods and evaluating their effects on business performance. *Total Quality Management,* 11(1), 129-37
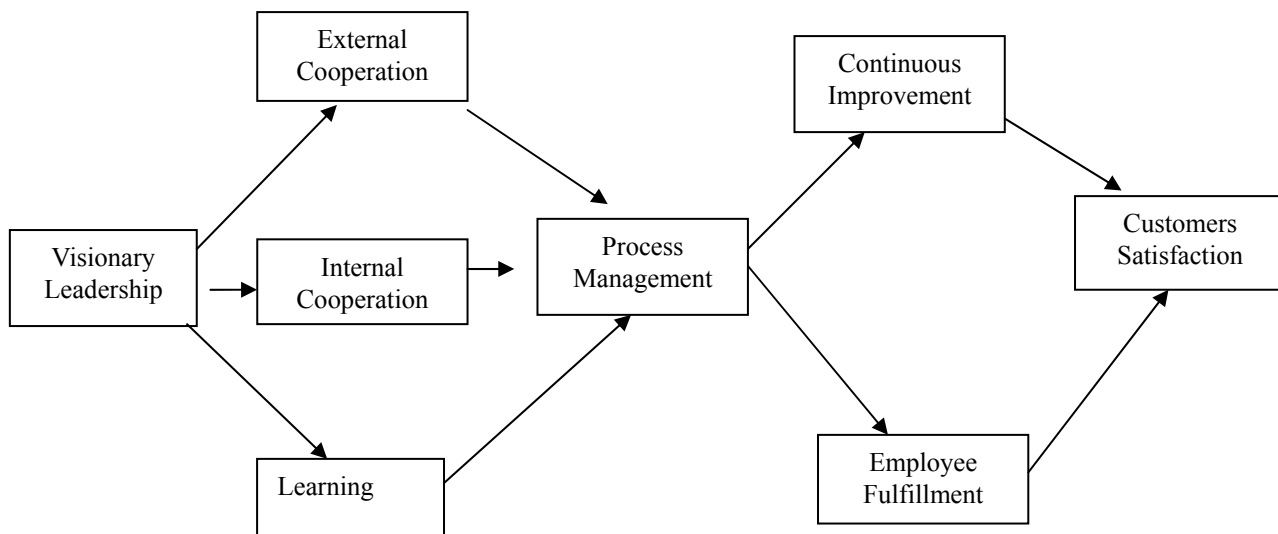
Table 1. Theoretical Framework

Table 2. Correlation Matrix

Variables	VL	ICP	ECP	LG	PM	CI	EF	CS
Visionary Leadership (VL)								
Internal Cooperation (ICP)	.642**							
External Cooperation (ECP)	622**	.648**						
Learning (LG)	.608**	.738**	.680**					
Process Management (PM)	.590**	.636**	.652**	.745**				
Continuous Improvement (CI)	.618**	.618**	.698**	.663**	.631**			
Employee Fulfillment (EF)	.242**	.199**	.248**	.183**	.209**	234**		
Customer Satisfaction (CS)	.163**	.164**	.150**	.206**	.163**	209**	.575**	

** Correlation is significant at $p < 0.01$ level (2 – tailed)

Table 3. Path Analysis

Paths	R^2	Beta	t value	Significance
Visionary leadership to internal cooperation	.412	.642	13.294	*0.001
Visionary leadership to external cooperation	.387	.622	12.607	*0.001
Visionary leadership to learning	.370	.608	12.995	*0.001
Internal cooperation to process management	.645	.222	4.129	*0.001
External cooperation to process management	.645	.222	4.192	*0.001
Learning to process management	.645	.488	8.158	*0.001
Process management to continuous improvement	.399	.631	13.815	*0.001
Process management to employee fulfillment	.044	.209	3.632	*0.001
Continuous improvement to customer satisfaction	.340	.034	2.039	*0.001
Employee fulfillment to customer satisfaction	.340	.555	11.346	*0.001

Significance level= *, $p < 0.001$