Quality Management: A Case from Pakistan Cotton yarn Industry

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Abstract

This paper is to determine the valid statistically inter-related quality management practices, which facilitate the development of quality oriented environment in organizations. Further, focus was on identifying the blend of quality management practices, which are mutually supportive in creating and facilitating a conducive and productive organizational culture. This research is conducted in cotton yarn industry of Pakistan, which is featured with global orientation and recognized for its unparalleled yarn quality. Mail survey methodology is applied by incorporating a structured questionnaire as research instrument. From literature review, thirty-five quality management practices were identified to develop a questionnaire based on Likert scale responses. Quality management practices adopted by cotton yarn mills were found positively correlated to each other, except the frequent change of suppliers which was negatively correlated with other practices. Further, this research provides strong arguments to use the quality management practices collectively to realize the promised performance outcomes.

***Key Words**: Quality Management, Empowerment, Top Management, Communication Quality, Business Process Re-engineering, Cotton yarn.*

Introduction

Globalization, growing market competition, and technological advancements have produced strong impact on the managerial thinking about quality as competitive edge. Technological advanced countries are far more responsive towards the planning and implementation of quality management practices than the developing countries. Although, a number of research studies have been conducted on quality management issues, but magnitude of these research studies is highly skewed towards the developed countries (e.g. USA, UK, JAPAN, etc.), and very rare literature regarding quality management in developing countries is available (Mellat *et al.,* 2007). Nations are significantly different from each other because of difference in their behaviors and attitudes that persist with their longstanding history. This difference in attitudes and behaviors on national scale is characterized as national culture. According to Fatima and Ahmad (2006), issue of quality has not been addressed appropriately in both business and industrial sectors of Pakistan, and both sectors have to offer committed efforts to narrow the gap between expected and existing quality status to re-emerge as market leaders in intensely competitive global marketplace.

The study of the relationships between quality management techniques and organization's performance is critical for the organizations and the researchers involved in organizational quality improvement programs. There is a great disagreement in concluding about the effectiveness of quality management implementation among the researchers, as some organization are more successful in reaping the benefits of quality

management other just failed to have any significance in quality improvement (Rogers, 1993).

This study addressed the research question "Do quality management practices interrelated in the work environment of the cotton yarn industry of Pakistan?" To conclude about the research question, bi-variate correlation analysis between quality management practices by Pearson correlation coefficient is performed. Although, a large number of studies have been reported concerned with issue of quality management practices, however no significant research studies have been evident from extensive literature review conducted in cotton yarn industry of Pakistan with focus on evaluation of quality management practices. This research is meant to explore the phenomenon of implementation quality management in cotton yarn industry, which will contribute significantly in the existing body of knowledge in particular to quality management field and will provide insight of cotton yarn industry of Pakistan.

Literature Review

Sila and Ebrahimpour (2002) provided a comprehensive discussion on critical success factors by reviewing research studies performed from 1989 to 2000 period. They, Sila and Ebrahimpour (2002) identified 25 critical success factors from 347 studies. Sharma (2006) performed an empirical study to establish the quality management dimensions and contextual factors which contributes significantly in enhancing organizational performance in Queensland business by incorporating quality management programs like TQM, IS0 9000, and both TQM and ISO 9000 simultaneously. Sharma (2006) replicated same 12 quality management factors suggested by Powell (1995) as comprehensive dimensions of a complete quality management program. These 12 factors are identified by Powell (1995) from a meticulous review of literature (Deming, 1986; Juran, 1986; Crosby, 1979; Flynn et al; 1995 and Saraph et al., 1989). These factors are (1) committed leadership or executive commitment, (2) adoption and communication of TQM or adopting the philosophy, (3) closer customer relationships, (4) closer supplier relationships, (5) benchmarking, (6) training, (7) open organization, (8) employees empowerment, (9) zero-defects mentality, (10) process improvement, (11) flexible manufacturing, and (12) measurements. Sharma (2006) used this research instrument in multidiscipline industries like food, beverage, textile, wood and paper, printing and publishing, petroleum including chemical, rubber and plastics, metal products, machinery and equipment, retail, banking and insurance, hotel, tourism, hospital, law firms, and repair shops. These industries were then segmented into three major strata manufacturing, service, and construction industries.

Mellat *et al*. (2007) conducted an empirical research study in petroleum industry to evaluate the effectiveness of quality management practices by incorporating the 13 quality management constructs proposed by Rao *et al*. (1999). Rao *et al*. (1999) used 7 quality management constructs from Malcolm Baldrige Award, while other quality management constructs were introduced and incorporated by them after verifying their validity and reliability.

Kannan *et al.* (1999) reviewed the quality management constructs proposed by many researchers (Saraph *et al.*, 1989; Anderson *et al.*, 1994; Flynn *et al.*, 1995; Ahire., 1996; Black and Porter, 1996). Kannan *et al.* (1999) recommended that pursuing of quality management practices could be effective for organizations by aligning quality management concepts with organizational efforts of exploration of new markets, advanced technologies, and improvement of process to reduce the process wastages. Kannan *et al.* (1999) further concluded that quality improvement programs should be ensured by manager to coordinate with organizational strategies on departmental bases.
From the literature review following sixteen quality management practices are identified and discussed comprehensively.

1. Top Management Role in Organizational Perspectives

It is the top management in the organizations, which envisage the destiny of the organization in terms of success in its business journey coupled with competitive market orientation. Quality management programs could be more effective in delivering performance outcomes in a congenial, supportive, and appreciative work environment, and only top management can shapeup the quality management efforts by providing supportive and constructive leadership. Daniel *et al*. (2007) investigated the top management role in rational decision making in the critical situation for the development of organizational performance, and concluded that the speed of decision-making is affected, by decision maker's achievement motivation, networking abilities, and action orientation. Lack of top management commitment and passion is considered one of the major obstacles for quality management programs in delivering its promised performance outcomes (Smith, 1991; Marash, 1993).

2. Teamwork Approach Among the Employees

Organizations seldom depend upon individuals to retain long-standing business accomplishments rather than team based approach is appreciated and promoted. A team is characterized with a group of interdependent employees, which have common goals to achieve with high level of coordination and homogeneity (Francis and Young, 1992). Effective implementation of quality management requires participation from every employee, teamwork among employees could be productive in smoothing the implementation of quality management, and the teamwork has been identified as essential factor for the success of quality management programs (Reed *et al.*, 2000).

3. Employees Training in Multidiscipline Skills

Trained and skilled employees are assumed as an asset for organizations striving for quality and productivity. Fast pace of technological advancement demands trained and skilled workforce in multidimensional jobs. Desired performance goals could be realized from quality management practices by making them trained and educated in both their job area and quality management. The behavior of employees within firms has important implications for organizational performance while, human resource management practices can affect individual employee performance through their influence over employees' skills and motivation; and through organizational structures that allow employees to improve how their jobs are performed (Mark, 1995). Mahour *et al.* (2007) suggested that trust and co-operative learning have significant role in determining the

success of strategic alliances within the domain of organization. Employee training has been considered critical factor in quality management programs (Saraph *et al.,* 1989; Ahire *et al.,* 1996). Training and development programs for employees enhance their motivation and commitment towards the organization (Bardoel and Sohal, 1999).

4. Communication Quality

Lack of quality communication has been identified as one of the major cause of quality management programs' failure in organizations. Quality management is a collective phenomenon, and everybody in the organization has to play its role to make quality management programs effective. However, quality issues, which are inadequately communicated or not communicated by any means among the stakeholders, would result in confusion and frustration in employees. Communication is considered a key ingredient in channelizing the decision process varying in extent from top to bottom, while, rational and productive decisions attributed to quality of information and communicating mode. Success of any quality management programs demands free communication within the organization (Suleiman and Steven, 1998). Communication channels should be effective in conveying not only responsibility and job requirements but, also the commitment of management that would help to reduce management barriers to employees (Saraph *et al.*, 1989; Ferdows and Demeyer, 1990).

5. Process Orientation

Quality management practices are meant to improve the quality of process, which are integrated to form an entire organizational system. Montgomery (2000) stated an inversely proportional relationship between process quality and process variations, and reduction in process variations is primary focus of quality improvement programs. Process orientation approach considers process designing, process controlling, and process monitoring which are core activities to ensure process quality.

6. Employee Involvement

Successful implementation of quality management practices demands effective contribution from everyone in the organization. Top management provides the environment and infrastructure to facilitate the implementation of quality management program, while, employees, at middle and low rank in organizational hierarchy, are the one who actually demonstrate the implementation in organization. Employees with high degree of motivation, strong commitment, and firm loyalty could make a real difference in implementing quality management practices effectively.

7. Employee Empowerment

Employee empowerment is an essential counterpart of job responsibility assigned to employee by the organization, inadequacy of balance between empowerment and responsibility could create inactive and inefficient employees with lack of ability to make decision regarding their jobs. Empowerment induces more confidence and provides more independence to employees in delivering their job responsibility with appropriate level of authority, which cause to minimize the dependency on long hierarchal chain in organization, and improves the work efficiency. Zoe (2002) highlighted the importance of empowerment of employees in success of quality management programs and

explained delegation as an internal work relationship between a superior and a subordinate, where the superior assigns a specific task or duty of his or her role to the subordinate and holds that individual personally responsible and accountable for results. Empowered and self-managing employees are more productive and efficient in delivering performance (Harvey *et al.*, 1992). Employee empowerment attributed to better human resource management (Jai and Satit, 2005), which is an essential requirement for the successful implementation of quality management programs.

8. Customer Focus

An organizational strategic approach, in which customers' quality requirements are prioritized and incorporated in product development, and ultimate organizational goal is to achieve customer satisfaction, is characterized as customer focused. An organization which achieves customer satisfaction, by providing the quality products and services beyond the expectations of customers, would be more competitive and successful (Drummond, 1992; Anschutz, 1995).

9. Customer Relations

Customer relations management addresses organizational approach to develop and channelize relations with customers by defining methods to motivate customer to provide their feedback and suggestions regarding quality improvement, which will further be incorporated in product development, and refining the service quality.

10. Supplier Management

Supplier management refers to measures taken by organizations to strengthen relations with suppliers to develop a business environment in which both supplier and customer organizations own business and recognized quality improvement as their mutual objective. Communication of quality requirements with suppliers, and contribution in supplier process development could be an effective strategy to encourage supplier participation in the process of product quality enhancement. The development of mutual corporation with supplier aiming at product quality improvement would be a productive and rational decision for both (Noci, 1996). When justified by economic and customer values, investment in a relationship with supplier is very prolific (Baven, 1987). Enterprises must develop a strong relation with group of suppliers to assure and enhance quality of their products (Gunasekaran *et al*., 1997).

11. Use Of Quality Management Tools

Use of quality management refers to the level of adoptions of quality management tools in the process of quality improvement. Quality management tools are proved effective in systemizing the processes to minimize processes failures, irregularities, and work delays.

12. Benchmarking

Benchmarking refers to organizational consideration of competitors' process, product, and market strategy and other best practices evaluation to learn lessons for in house quality improvement (Walton, 1990). Benchmarking has been characterized with investigational tools to identify best management practices that competitors or market

leaders have adopted to gain competitive edge in delivering high performance (Rao *et al.*, 1999).

13. Use Of Statistical Process Control

Statistical quality control refers to statistical practices used for identification of quality problems, controlling and monitoring of process parameters, and testing and inspection of process outputs. Statistical process control differentiates between natural and assignable variations and effectively controls and monitors the manufacturing process for specified quality parameters (Montgomery, 2000).

14. Business Process Re-Engineering

Business process re-engineering refers to consideration of process for effective change in business process, to reduce process bottlenecks, by the management to achieve better performance. Rapid change of technology has been highly observed from last three decades and the knowledge of these developments is considered critical to revise and improve the existing business and production processes to achieve better performance in more competitive market. Business growth of the organization is based on the investment strategy implemented by the organization; rational investment decisions within the domain of organization help to reduce business costs and provide a competitive edge to the organization (Carol, 2007).

15. Performance Appraisal System

Performance appraisal system refers to the means by which an organization evaluates the job performance of its employee, the distribution of rewards, and provision of incentive for performance. An unbiased, indiscriminative, and appreciative performance appraisal system is indispensible for healthy and supportive organizational environment. Motivated, committed, and loyal employees are considered real asset for organizations but poorly structured appraisal system characterized as biased and discriminative could proved frustrating and destructive for employees morale. Organization should focus on performance appraisal system to remove it potential pitfalls (Pettigrew, 1995).

16. Investment in Quality Management

Investment in quality management programs is a strong indicator of management commitment towards the implementation of quality management programs to meet the challenges posed by competitive market and to satisfy well-informed and educated customers. Business growth of the organization is based on the investment strategy implemented by the organization; rational investment decisions within the domain of organization help to reduce business costs and provide a competitive edge to the organization (Carol, 2007).

Methodology

The target population for this study is comprised of composite and independent cotton spinning mills, which are members of All Pakistan Textiles Manufacturing Association (APTMA) across the Pakistan. A sample of size 201 cotton-spinning mills was defined appropriate, statistically, to represent the population of 423 cotton-spinning mills by considering five percent sampling error at 95 percent confidence interval. The focus of

the study was limited to one quality management representative from each cotton yarn mill, however; it was observed that in small size mills both the responsibilities of production and quality assurance assigned to the same manager, while large mills have different personnel as production managers and quality assurance managers (Hussain, 2008)

Mail survey method is used to collect the data, regarding the implementation of quality management, from the cotton spinning industry of Pakistan. Survey questionnaires, enclosed in envelop with cover letter, were sent to the cotton spinning mills, selected as sampling unit, by mail through the courtesy of APTMA (All Pakistan Textile Manufacturing Association) and SMEDA (Small Medium Enterprise Development Authority). One of the critical issues in mail surveys is the response rate as discussed by Salant and Dillman (1994). To increase the response rate a number of follow-ups were made, by the author, to remind the participants through telephone calls, and visiting sample mills. One hundred ten questionnaires completed in all aspects were received to realize a response rate of 54.73 (55%). All the respondent mangers were male with average age of thirty-seven years, and four years average experience of cotton yarn industry. There were thirty-one (28%) composite mills, and seventy-nine (72%) mills were involved only in manufacturing yarn (Hussain *et al*, 2008).

The instrument constructed, in this research is consisted of a thirty-five items related to quality management practices commonly used in cotton spinning industry. The research participants were asked to share their experience of quality management practices implemented by their mills to enhance the organization quality level realized from the implementation. The instrument used a five-point Likert scale reflecting a range of attitude from strongly disagrees to the strongly agree. The coding of the Likert scale was made as [1] = strongly disagree], [2 = disagree], [3 = neither agree nor disagree], [4 = agree], [5 = strongly agree].

Data Analysis

To understand the role of adoption of one quality management practice on the adoption or existence of other quality management practice in the cotton-spinning mill, the correlation analysis is used to measure the interrelationship between the quality management practices and the results are reported along with Pearson correlation coefficient r and level of significance p. Correlation is significant at 0.01 level if p value is at-most 0.01, and is significant at 0.05 if p value is at-most 0.05. Following are quality management practices used in study, along with their coding for data analysis.

Independent Variables

- Teamwork = TWRK
- Technical discussion between employees = TDE
- Role of senior employees as trainers = RSET
- Team reward system = TRS
- Quality communication = QCOM
- Evaluation of market trends = EMT
- Internal customer focus = ICF

- Organization as customer focused = OCF
- Customer Needs Identification = CNI
- Customer problem solving system = CPSS
- Effectiveness of customer problem system = ECPS
- Customer relation management = CRM
- Targets for customer Satisfaction = TCS
- Customer feedback as quality improvement tool = CFQT
- Customer Encouragement for feedback = CEF
- Employees' suggestions towards quality improvement = EIA
- Quality as a management goal = QAMG
- Top management support for change = TMSC
- Setting of organizational targets = SOT
- Delegation of authority with responsibility = DRWA
- Investment in quality enhancement = IQE
- Employees' empowerment = EEPW
- Training programs = TRIP
- Training for industry trends = TRIND
- Training for new technology = TRTEC
- Absence of discrimination at organization = ADISC
- Documentation of procedure = DPRS
- Benchmarking = BENCH
- Organizational environment = OEN
- Use of quality management tools for improvement = QMTI
- Evaluation of suppliers' quality management systems = ESQM
- Use of SQC for supplier management = SQCS
- Investment in business process reengineering = IBPR
- Complaint management = COM
- Change of suppliers = COS

Dependent Variables

- Rejection Rate = RRATE
- Profit per unit = PPU
- Sale volume = SVOL
- Market share = MSHR
- Organizational performance improvement = OPI

Correlation Analysis

Correlation analysis between TDE and all other independent variables was studied, which revealed that TDE has positive correlations with the other quality management practices. The highest correlation of TDE is observed with TWOK r = 0.739, p=0.000, and the lowest positive correlation of TDE is with CFQT r = 0.349, p = 0.000. The correlation between TDE and quality performance indicators shows that TDE has positive correlations with OPI r = 0.564, p = 000, SVOL r = 0.656, p = 0.000, RATE r = 0.753, p =0.000, PRFT r = 0.738,p = 0.000 and MSHR r = 0.759, p = 0.000. Table 1 provides the correlation coefficients of TDE with other studied variables with p-value.

Table 1: Correlation Analysis of TDE

Attribute	TWOK	TDE	RSET	TRS	QCOM	EMT	ICF	OCF
Pearson Correlation	.739	1	.705	.727	.677	.599	.582	.507
Sig.(2-tailed)	.000		.000	.000	.000	.000	.000	.000
Attribute	CNI	CPSS	ECPS	CRM	TCS	CFQT	CEF	FIA
Pearson Correlation	.506	.539	.512	.433	.479	.349	.401	.531
Sig.(2-tailed)	.000	.000	.000	.000	.000	.000	.000	.000
Attribute	QAMG	TMSC	SOT	DRWA	IQE	EEPW	TRIP	TREND
Pearson Correlation	.510	.569	.610	.579	.673	.526	.486	.567
Sig.(2-tailed)	.000	.000	.000	.000	.000	.000	.000	.000
Attribute	TRTEC	ADISC	DPRS	BENCH	OEN	OPI	QMTI	ESQM
Pearson Correlation	.582	.401	.636	.607	.658	.564	.569	.503
Sig.(2-tailed)	.000	.000	.000	.000	.000	.000	.000	.000
Attribute	SQCS	SVOL	COM	COS	RRATE	PRFT	MSHAR	IBPR
Pearson Correlation	.670	.656	.650	-.325	.753	.738	.759	.694
Sig.(2-tailed)	.000	.000	.000	.001	.000	.000	.000	.000

Correlation analysis between RSET and all other independent variables was studied, which revealed that RSET has positive correlations with the other quality management practices. The highest correlation of RSET is observed with TRS r = 0.794, p=0.000, and the lowest positive correlation of RSET is with ECPS r = 0.285, p = 0.03. The correlation between RSET and quality performance indicators shows that RSET has positive correlations with OPI r = 0.451, p = 000, SVOL r = 0.552, p = 0.000, RRATE r = 0.698, p =0.000, PRFT r = 0.646, p = 0.000 and MSHR r = 0.602, p = 0.000. Table 2 provides the correlation coefficients of RSET with other studied variables along with p-value.

Table 2: Correlation Analysis of RSET

Attribute	TWOK	TDE	RSET	TRS	QCOM	EMT	ICF	OCF
Pearson Correlation	.780	.705	1	.794	.679	.463	.491	.534
Sig.(2-tailed)	.000	.000		.000	.000	.000	.000	.000
Attribute	CNI	CPSS	ECPS	CRM	TCS	CFQT	CEF	FIA
Pearson Correlation	.562	.562	.381	.471	.470	.314	.448	.399
Sig.(2-tailed)	.000	.000	.000	.000	.000	.000	.000	.000
Attribute	QAMG	TMSC	SOT	DRWA	IQE	EEPW	TRIP	TREND
Pearson Correlation	.554	.534	.463	.481	.552	.452	.433	.573
Sig.(2-tailed)	.000	.000	.000	.000	.000	.000	.000	.000
Attribute	TRTEC	ADISC	DPRS	BENCH	OEN	OPI	QMTI	ESQM
Pearson Correlation	.552	.359	.443	.464	.701	.451	.511	.577
Sig.(2-tailed)	.000	.000	.000	.000	.000	.000	.000	.000
Attribute	SQCS	SVOL	COM	COS	RRATE	PRFT	MSHAR	IBPR
Pearson Correlation	.554	.552	.573	-.151	.698	.646	.602	.621
Sig.(2-tailed)	.000	.000	.000	.116	.000	.000	.000	.000

Correlation analysis between TRS and all other independent variables was studied, which revealed that TRS has positive correlations with the other quality management practices. The highest correlation of TRS is observed with TWOK r = 0.820, p=0.000, and the lowest positive correlation of TRS is with ADISC r = 0.440, p = 0.000. The correlation between TRS and quality performance indicators shows that TRS has positive correlations with OPI r = 0.529, p = 000, SVOL r = 0.662, p = 0.000, RRATE r = 0.737,

p =0.000, PRFT r = 0.726, p = 0.000 and MSHR r = 0.659, p = 0.000. Table 3 provides the correlation coefficients of TRS with other studied variables along with p-value.

Table 3: Correlation Analysis of TRS

Attribute	TWOK	TDE	RSET	TRS	QCOM	EMT	ICF	OCF
Pearson Correlation	.820	.727	.794	1	.649	.517	.579	.539
Sig.(2-tailed)	.000	.000	.000		.000	.000	.000	.000
Attribute	CNI	CPSS	ECPS	CRM	TCS	CFQT	CEF	FIA
Pearson Correlation	.522	.498	.487	.496	.470	.462	.472	.529
Sig.(2-tailed)	.000	.000	.000	.000	.000	.000	.000	.000
Attribute	QAMG	TMSC	SOT	DRWA	IQE	EEPW	TRIP	TREND
Pearson Correlation	.583	.561	.588	.534	.594	.588	.558	.612
Sig.(2-tailed)	.000	.000	.000	.000	.000	.000	.000	.000
Attribute	TRTEC	ADISC	DPRS	BENCH	OEN	OPI	QMTI	ESQM
Pearson Correlation	.574	.440	.585	.521	.722	.529	.607	.475
Sig.(2-tailed)	.000	.000	.000	.000	.000	.000	.000	.000
Attribute	SQCS	SVOL	COM	COS	RRATE	PRFT	MSHAR	IBPR
Pearson Correlation	.598	.662	.628	-.227	.737	.726	.659	.671
Sig.(2-tailed)	.000	.000	.000	.017	.000	.000	.000	.000

Correlation analysis between QCOM and all other independent variables was studied, which revealed that QCOM has positive correlations with the other quality management practices. The highest correlation of QCOM is observed with RRATE r = 0.731, p=0.000, and the lowest positive correlation of QCOM is with ECPS r = 0.412, p = 0.000. The correlation between QCOM and quality performance indicators shows that QCOM has positive correlations with OPI r = 0.693, p = 000, SVOL r = 0.662, p = 0.000, RRATE r = 0.731, p =0.000, PRFT r = 0.677, p = 0.000 and MSHR r = 0.657, p = 0.000. Table 4 provides the correlation coefficients of QCOM with other studied variables along with p-value.

Table 4: Correlation Analysis of QCOM

Attribute	TWOK	TDE	RSET	TRS	QCOM	EMT	ICF	OCF
Pearson Correlation	.651	.667	.679	.649	1	.641	.664	.633
Sig.(2-tailed)	.000	.000	.000	.000		.000	.000	.000
Attribute	CNI	CPSS	ECPS	CRM	TCS	CFQT	CEF	FIA
Pearson Correlation	.620	.484	.412	.468	.492	.441	.443	.566
Sig.(2-tailed)	.000	.000	.000	.000	.000	.000	.000	.000
Attribute	QAMG	TMSC	SOT	DRWA	IQE	EEPW	TRIP	TREND
Pearson Correlation	.699	.582	.640	.576	.695	.713	.659	.671
Sig.(2-tailed)	.000	.000	.000	.000	.000	.000	.000	.000
Attribute	TRTEC	ADISC	DPRS	BENCH	OEN	OPI	QMTI	ESQM
Pearson Correlation	.571	.637	.672	.645	.726	.693	.687	.527
Sig.(2-tailed)	.000	.000	.000	.000	.000	.000	.000	.000
Attribute	SQCS	SVOL	COM	COS	RRATE	PRFT	MSHAR	IBPR
Pearson Correlation	.633	.662	.691	-.327	.731	.677	.657	.744
Sig.(2-tailed)	.000	.000	.000	.000	.000	.000	.000	.000

Correlation analysis between EMT and all other independent variables was studied, which revealed that EMT has positive correlations with the other quality management practices. The highest correlation of EMT is observed with BENCH r = 0.789, p=0.000, and the lowest positive correlation of EMT is with CFQT r = 0.317, p = 0.000. The correlation between EMT and quality performance indicators shows that EMT has positive correlations with OPI r = 0.664, p = 000, SVOL r = 0.588, p = 0.000, RRATE r =

0.594, p =0.000, PRFT r = 0.602, p = 0.000 and MSHR r = 0.691, p = 0.000. Table 5 provides the correlation coefficients of EMT with other studied variables along with p-value.

Table 5: Correlation Analysis of EMT

Attribute	TWOK	TDE	RSET	TRS	QCOM	EMT	ICF	OCF
Pearson Correlation	.513	.599	.463	.517	.641	1	.622	.424
Sig.(2-tailed)	.000	.000	.000	.000	.000		.000	.000
Attribute	CNI	CPSS	ECPS	CRM	TCS	CFQT	CEF	FIA
Pearson Correlation	.517	.470	.425	.500	.474	.317	.468	.611
Sig.(2-tailed)	.000	.000	.000	.000	.000	.000	.000	.000
Attribute	QAMG	TMSC	SOT	DRWA	IQE	EEPW	TRIP	TREND
Pearson Correlation	.618	.576	.581	.530	.665	.638	.593	.657
Sig.(2-tailed)	.000	.000	.000	.000	.000	.000	.000	.000
Attribute	TRTEC	ADISC	DPRS	BENCH	OEN	OPI	QMTI	ESQM
Pearson Correlation	.656	.580	.752	.989	.675	.664	.732	.502
Sig.(2-tailed)	.000	.000	.000	.000	.000	.000	.000	.000
Attribute	SQCS	SVOL	COM	COS	RRATE	PRFT	MSHAR	IBPR
Pearson Correlation	.567	.588	.632	-.048	.594	.602	.691	.706
Sig.(2-tailed)	.000	.000	.000	.548	.000	.000	.000	.000

Correlation analysis between ICF and all other independent variables was studied, which revealed that ICF has positive correlations with the other quality management practices. The highest correlation of ICF is observed with OEM r = 0.759, p=0.000, and the lowest positive correlation of ICF is with CFQT r = 0.333, p = 0.000. The correlation between ICF and quality performance indicators shows that ICF has positive correlations with OPI r = 0.637, p = 000, SVOL r = 0.687, p = 0.000, RRATE r = 0.562, p =0.000, PRFT r = 0.712, p = 0.000 and MSHR r = 0.699, p = 0.000. Table 5 provides the correlation coefficients of ICF with other studied variables along with p-value.

Table 5: Correlation Analysis of ICF

Attribute	TWOK	TDE	RSET	TRS	QCOM	EMT	ICF	OCF
Pearson Correlation	.606	.582	.491	.579	.664	.622	1	.589
Sig.(2-tailed)	.000	.000	.000	.000	.000	.000		.000
Attribute	CNI	CPSS	ECPS	CRM	TCS	CFQT	CEF	FIA
Pearson Correlation	.589	.394	.589	.514	.366	.333	.469	.693
Sig.(2-tailed)	.000	.000	.000	.000	.000	.000	.000	.000
Attribute	QAMG	TMSC	SOT	DRWA	IQE	EEPW	TRIP	TREND
Pearson Correlation	.546	.572	.604	.587	.737	.742	.516	.622
Sig.(2-tailed)	.000	.000	.000	.000	.000	.000	.000	.000
Attribute	TRTEC	ADISC	DPRS	BENCH	OEN	OPI	QMTI	ESQM
Pearson Correlation	.561	.618	.671	.620	.759	.637	.641	.570
Sig.(2-tailed)	.000	.000	.000	.000	.000	.000	.000	.000
Attribute	SQCS	SVOL	COM	COS	RRATE	PRFT	MSHAR	IBPR
Pearson Correlation	.628	.687	.623	-.487	.562	.712	.699	.713
Sig.(2-tailed)	.000	.000	.000	.000	.000	.000	.000	.000

Correlation analysis between OCF and all other independent variables was studied, which revealed that OCF has positive correlations with the other quality management practices. The highest correlation of OCF is observed with CNI r = 0.646, p = 0.000, and the lowest positive correlation of OCF is with CFQT and TRIP r = 0.333, p = 0.000. The correlation between OCF and quality performance indicators shows that OCF has positive correlations with OPI r = 0.433, p = 000, SVOL r = 0.613, p = 0.000, RRATE r = 0.513,

p =0.000, PRFT r = 0.578, p = 0.000 and MSHR r = 0.531, p = 0.000. Table 6 provides the correlation coefficients of OCF with other studied variables along with p-value.

Table 6: Correlation Analysis of OCF

Attribute	TWOK	TDE	RSET	TRS	QCOM	EMT	ICF	OCF
Pearson Correlation	.502	.507	.534	.539	.633	.424	.589	1
Sig.(2-tailed)	.000	.000	.000	.000	.000	.000	.000	
Attribute	CNI	CPSS	ECPS	CRM	TCS	CFQT	CEF	FIA
Pearson Correlation	.646	.442	.400	.639	.267	.297	.615	.366
Sig.(2-tailed)	.000	.000	.000	.000	.000	.002	.000	.000
Attribute	QAMG	TMSC	SOT	DRWA	IQE	EEPW	TRIP	TREND
Pearson Correlation	.453	.358	.370	.310	.560	.555	.333	.595
Sig.(2-tailed)	.000	.000	.000	.000	.000	.000	.000	.000
Attribute	TRTEC	ADISC	DPRS	BENCH	OEN	OPI	QMTI	ESQM
Pearson Correlation	.414	.421	.412	.433	.550	.433	.361	.418
Sig.(2-tailed)	.000	.000	.000	.000	.000	.000	.000	.000
Attribute	SQCS	SVOL	COM	COS	RRATE	PRFT	MSHAR	IBPR
Pearson Correlation	.589	.613	.648	-.312	.513	.578	.531	.608
Sig.(2-tailed)	.000	.000	.000	.001	.000	.000	.000	.000

Correlation analysis between CNI and all other independent variables was studied, which revealed that CNI has positive correlations with the other quality management practices. The highest correlation of CNI is observed with TRIND r = 0.713, p = 0.000, and the lowest positive correlation of CNI is with TCS r = 0.335, p = 0.000. The correlation between CNI and quality performance indicators shows that CNI has positive correlations with OPI r = 0.449, p = 000, SVOL r = 0.639, p = 0.000, RRATE r = 0.535, p =0.000, PRFT r = 0.618, p = 0.000 and MSHR r = 0.566, p = 0.000. Table 7 provides the correlation coefficients of CNI with other studied variables along with p-value.

Table 7: Correlation Analysis of CNI

Attribute	TWOK	TDE	RSET	TRS	QCOM	EMT	ICF	OCF
Pearson Correlation	.425	.506	.562	.522	.620	.517	589	.646
Sig.(2-tailed)	.000	.000	.000	.000	.000	.000	.000	.000
Attribute	CNI	CPSS	ECPS	CRM	TCS	CFQT	CEF	FIA
Pearson Correlation	1	.526	.525	.517	.335	.427	.496	.567
Sig.(2-tailed)		.000	.000	.000	.000	.000	.000	.000
Attribute	QAMG	TMSC	SOT	DRWA	IQE	EEPW	TRIP	TREND
Pearson Correlation	.575	.550	.530	.409	.634	.581	.586	.713
Sig.(2-tailed)	.000	.000	.000	.000	.000	.000	.000	.000
Attribute	TRTEC	ADISC	DPRS	BENCH	OEN	OPI	QMTI	ESQM
Pearson Correlation	.636	.525	.505	.545	.675	.549	.612	.573
Sig.(2-tailed)	.000	.000	.000	.000	.000	.000	.000	.000
Attribute	SQCS	SVOL	COM	COS	RRATE	PRFT	MSHAR	IBPR
Pearson Correlation	.596	.639	.614	-.263	.535	.618	.566	.676
Sig.(2-tailed)	.000	.000	.000	.006	.000	.000	.000	.000

Correlation analysis between CPSS and all other independent variables was studied, which revealed that CPSS has positive correlations with the other quality management practices. The highest correlation of CPSS is observed with TRIND r = 0.713, p = 0.000, and the lowest positive correlation of CPSS is with TCS r = 0.335, p = 0.000. The correlation between CPSS and quality performance indicators shows that CPSS has positive correlations with OPI r = 0.535, p = 000, SVOL r = 0.511, p = 0.000, RRATE r =

0.608, p =0.000, PRFT r = 0.521, p = 0.000 and MSHR r = 0.521, p = 0.000. Table 8 provides the correlation coefficients of CPSS with other studied variables along with p-value.

Table 8: Correlation Analysis of CPSS

Attribute	TWOK	TDE	RSET	TRS	QCOM	EMT	ICF	OCF
Pearson Correlation	.488	.539	.562	.498	.484	.470	.394	.442
Sig.(2-tailed)	.000	.000	.000	.000	.000	.000	.000	.000
Attribute	CNI	CPSS	ECPS	CRM	TCS	CFQT	CEF	FIA
Pearson Correlation	.526	1	.648	.620	.434	.378	.599	.464
Sig.(2-tailed)	.000		.000	.000	.000	.000	.000	.000
Attribute	QAMG	TMSC	SOT	DRWA	IQE	EEPW	TRIP	TREND
Pearson Correlation	.573	.631	.522	.546	.577	.439	.514	.475
Sig.(2-tailed)	.000	.000	.000	.000	.000	.000	.000	.000
Attribute	TRTEC	ADISC	DPRS	BENCH	OEN	OPI	QMTI	ESQM
Pearson Correlation	.454	.368	.459	.481	.579	.535	.488	.437
Sig.(2-tailed)	.000	.000	.000	.000	.000	.000	.000	.000
Attribute	SQCS	SVOL	COM	COS	RRATE	PRFT	MSHAR	IBPR
Pearson Correlation	.415	.511	.509	-.349	.608	.521	.521	.600
Sig.(2-tailed)	.000	.000	.000	.000	.000	.000	.000	.000

Correlation analysis between ECPS and all other independent variables was studied, which revealed that ECPS has positive correlations with the other quality management practices. The highest correlation of ECPS is observed with CPSS r = 0.648, p = 0.000, and the lowest positive correlation of CFQT r = 0.272, p = 0.004. The correlation between ECPS and quality performance indicators shows that ECPS has positive correlations with OPI r = 0.555, p = 000, SVOL r = 0.562, p = 0.000, RRATE r = 0.488, p =0.000, PRFT r = 0.562, p = 0.000 and MSHR r = 0.529, p = 0.000. Table 9 provides the correlation coefficients of ECPS with other studied variables along with p-value.

Table 9: Correlation Analysis of ECPS

Attribute	TWOK	TDE	RSET	TRS	QCOM	EMT	ICF	OCF
Pearson Correlation	.513	.512	.381	.487	.412	.425	.589	.400
Sig.(2-tailed)	.000	.000	.000	.000	.000	.000	.000	.000
Attribute	CNI	CPSS	ECPS	CRM	TCS	CFQT	CEF	FIA
Pearson Correlation	.525	.628	1	.537	.351	.272	.513	.558
Sig.(2-tailed)	.000	.000		.000	.000	.004	.000	.000
Attribute	QAMG	TMSC	SOT	DRWA	IQE	EEPW	TRIP	TREND
Pearson Correlation	.507	.563	.557	.597	.648	.547	.446	.411
Sig.(2-tailed)	.000	.000	.000	.000	.000	.000	.000	.000
Attribute	TRTEC	ADISC	DPRS	BENCH	OEN	OPI	QMTI	ESQM
Pearson Correlation	.401	.497	.451	.433	.518	.555	.457	.509
Sig.(2-tailed)	.000	.000	.000	.000	.000	.000	.000	.000
Attribute	SQCS	SVOL	COM	COS	RRATE	PRFT	MSHAR	IBPR
Pearson Correlation	.513	.562	.449	-.488	.488	.562	.529	.554
Sig.(2-tailed)	.000	.000	.000	.000	.000	.000	.000	.000

Correlation analysis between CRM and all other independent variables was studied, which revealed that CRM has positive correlations with the other quality management practices. The highest correlation of CRM is observed with CEF r = 0.970, p = 0.000, and the lowest positive correlation of DRWA r = 0.219, p = 0.022. The correlation between CRM and quality performance indicators shows that CRM has positive correlations with

OPI r = 0.413, p = 000, SVOL r = 0.474, p = 0.000, RRATE r = 0.453, p =0.000, PRFT r = 0.500, p = 0.000 and MSHR r = 0.462, p = 0.000. Table 10 provides the correlation coefficients of CRM with other studied variables along with p-value.

Table 10: Correlation Analysis of CRM

Attribute	TWOK	TDE	RSET	TRS	QCOM	EMT	ICF	OCF
Pearson Correlation	.437	.433	.471	.496	.68	.500	.514	.639
Sig.(2-tailed)	.000	.000	.000	.000	.000	.000	.000	.000
Attribute	CNI	CPSS	ECPS	CRM	TCS	CFQT	CEF	FIA
Pearson Correlation	.517	.620	.517	1	.302	.243	.970	.443
Sig.(2-tailed)	.000	.000	.000		.001	.011	.000	.000
Attribute	QAMG	TMSC	SOT	DRWA	IQE	EEPW	TRIP	TREND
Pearson Correlation	.343	.358	.283	.219	.561	.602	.344	.410
Sig.(2-tailed)	.000	.000	.003	.000	.000	.000	.000	.000
Attribute	TRTEC	ADISC	DPRS	BENCH	OEN	OPI	QMTI	ESQM
Pearson Correlation	.303	.346	.397	.513	.460	.413	.439	.490
Sig.(2-tailed)	.001	.000	.000	.000	.000	.000	.000	.000
Attribute	SQCS	SVOL	COM	COS	RRATE	PRFT	MSHAR	IBPR
Pearson Correlation	.483	.474	.421	-.226	.453	.500	.462	.605
Sig.(2-tailed)	.000	.000	.000	.018	.000	.000	.000	.000

Correlation analysis between TCS and all other independent variables was studied, which revealed that TCS has positive correlations with the other quality management practices. The highest correlation of TCS is observed with OEN r = 0.636, p = 0.000, and the lowest positive correlation of OCF r = 0.267, p = 0.022. The correlation between TCS and quality performance indicators shows that TCS has positive correlations with OPI r = 0.598, p = 000, SVOL r = 0.601, p = 0.000, RRATE r = 0.605, p =0.000, PRFT r = 0.587, p = 0.000 and MSHR r = 0.580, p = 0.000. Table 11 provides the correlation coefficients of TCS with other studied variables along with p-value.

Table 11: Correlation Analysis of TCS

Attribute	TWOK	TDE	RSET	TRS	QCOM	EMT	ICF	OCF
Pearson Correlation	.420	.479	.470.0	.470	.492	.474	.366	.267
Sig.(2-tailed)	.000	.000	00	.000	.000	.000	.000	.000
Attribute	CNI	CPSS	ECPS	CRM	TCS	CFQT	CEF	FIA
Pearson Correlation	.335	.434	.351	.302	1	.271	.280	.310
Sig.(2-tailed)	.000	.000	.000	.001	.000	.004	.003	.001
Attribute	QAMG	TMSC	SOT	DRWA	IQE	EEPW	TRIP	TREND
Pearson Correlation	.481	.495	.470	.518	.421	.395	.332	.387
Sig.(2-tailed)	.000	.000	.000	.000	.000	.000	.000	.000
Attribute	TRTEC	ADISC	DPRS	BENCH	OEN	OPI	QMTI	ESQM
Pearson Correlation	.294	.319	.494.0	.500	.636	.598	.500	.415
Sig.(2-tailed)	.002	.001	00	.000	.000	.000	.000	.000
Attribute	SQCS	SVOL	COM	COS	RRATE	PRFT	MSHAR	IBPR
Pearson Correlation	.499	.601	.520	-.137	.605	.587	.580	.554
Sig.(2-tailed)	.000	.000	.000	.000	.000	.000	.000	.000

Correlation analysis between CFQT and all other independent variables was studied, which revealed that CFQT has positive correlations with the other quality management practices. The highest correlation of CFQT is observed with TRIP r = 0.655, p = 0.000, and the lowest positive correlation of CEF r = 0.223, p = 0.019. The correlation between

CFQT and quality performance indicators shows that CFQT has positive correlations with OPI r = 0.486, p = 000, SVOL r = 0.418, p = 0.000, RRATE r = 0.528, p =0.000, PRFT r = 0.430, p = 0.000 and MSHR r = 0.313, p = 0.001. Table 12 provides the correlation coefficients of CFQT with other studied variables along with p-value.

Table 12: Correlation Analysis Of CFQT

Attribute	TWOK	TDE	RSET	TRS	QCOM	EMT	ICF	OCF
Pearson Correlation	.285	.349	.314	.462	.441	.317	.333	.297
Sig.(2-tailed)	.003	.000	.000	.000	.000	.000	.000	.002
Attribute	CNI	CPSS	ECPS	CRM	TCS	CFQT	CEF	FIA
Pearson Correlation	.427	.378	.272	.243	.271	1	.223	.465
Sig.(2-tailed)	.000	.000	.004	.011	.04		.019	.000
Attribute	QAMG	TMSC	SOT	DRWA	IQE	EEPW	TRIP	TREND
Pearson Correlation	.424	.541	.575	.479	.403	.422	.655	.530
Sig.(2-tailed)	.000	.000	.000	.000	.000	.000	.000	.000
Attribute	TRTEC	ADISC	DPRS	BENCH	OEN	OPI	QMTI	ESQM
Pearson Correlation	.494	.324	.407	.319	.451	.486	.493	.389
Sig.(2-tailed)	.000	.001	.000	.000	.000	.000	.000	.000
Attribute	SQCS	SVOL	COM	COS	RRATE	PRFT	MSHAR	IBPR
Pearson Correlation	.221	.418	.305	-.401	.528	.430	.313	.416
Sig.(2-tailed)	.000	.000	.001	.000	.000	.000	.000	.000

Correlation analysis between CEF and all other independent variables was studied, which revealed that CEF has positive correlations with the other quality management practices. The highest correlation of CEF is observed with CRM r = 0.970, p = 0.000, and the lowest positive correlation of CFQT r = 0.223, p = 0.019. The correlation between CEF and quality performance indicators shows that CEF has positive correlations with OPI r = 0.486, p = 000, SVOL r = 0.433, p = 0.000, RRATE r = 0.426, p =0.000, PRFT r = 0.465, p = 0.000 and MSHR r = 0.426, p = 0.001. Table 13 provides the correlation coefficients of CEF with other studied variables along with p-value.

Table 13: Correlation Analysis of CEF

Attribute	TWOK	TDE	RSET	TRS	QCOM	EMT	ICF	OCF
Pearson Correlation	.411	.401	.448	.472	.443	.468	.469	.615
Sig.(2-tailed)	.000	.000	.000	.000	.000	.000	.000	.000
Attribute	CNI	CPSS	ECPS	CRM	TCS	CFQT	CEF	FIA
Pearson Correlation	.496	.599	.513	.970	.280	.223	1	.417
Sig.(2-tailed)	.000	.000	.000	.000	.000	.019		.000
Attribute	QAMG	TMSC	SOT	DRWA	IQE	EEPW	TRIP	TREND
Pearson Correlation	.314	.256	.190	.523	.553	.315	.383	.383
Sig.(2-tailed)	.001	.000	.000	.047	.000	.000	.001	.000
Attribute	TRTEC	ADISC	DPRS	BENCH	OEN	OPI	QMTI	ESQM
Pearson Correlation	.278	.296	.361	.479	.406	.385	.409	.460
Sig.(2-tailed)	.003	.002	.000	.000	.000	.000	.000	.000
Attribute	SQCS	SVOL	COM	COS	RRATE	PRFT	MSHAR	IBPR
Pearson Correlation	.453	.433	.393	-.181	.426	.465	.426	.578
Sig.(2-tailed)	.000	.000	.000	.058	.000	.000	.000	.000

Correlation analysis between EIA and all other independent variables was studied, which revealed that EIA has positive correlations with the other quality management practices. The highest correlation of EIA is observed with IQE r = 0.752, p = 0.000, and the lowest

positive correlation of RSET r = 0.223, p = 0.000. The correlation between EIA and quality performance indicators shows that EIA has positive correlations with OPI r = 0.702, p = 000, SVOL r = 0.675, p = 0.000, RRATE r = 0.519, p =0.000, PRFT r = 0.657, p = 0.000 and MSHR r = 0.591, p = 0.000. Table 14 provides the correlation coefficients of EIA with other studied variables along with p-value.

Table 14: Correlation Analysis of FIA

Attribute	TWOK	TDE	RSET	TRS	QCOM	EMT	ICF	OCF
Pearson Correlation	.526	.531	.399	.529	.566	.611	.693	.366
Sig.(2-tailed)	.000	.000	.000	.000	.000	.000	.000	.000
Attribute	CNI	CPSS	ECPS	CRM	TCS	CFQT	CEF	FIA
Pearson Correlation	.567	.464	.558	.443	.310	.465	.417	1
Sig.(2-tailed)	.000	.000	.000	.000	.000	.000	.000	.000
Attribute	QAMG	TMSC	SOT	DRWA	IQE	EEPW	TRIP	TREND
Pearson Correlation	.616	.734	.664	.623	.752	.613	.637	.520
Sig.(2-tailed)	.000	.000	.000	.000	.000	.000	.000	.000
Attribute	TRTEC	ADISC	DPRS	BENCH	OEN	OPI	QMTI	ESQM
Pearson Correlation	.524	.589	.591	.622	.577	.702	.633	.579
Sig.(2-tailed)	.000	.000	.000	.000	.000	.000	.000	.000
Attribute	SQCS	SVOL	COM	COS	RRATE	PRFT	MSHAR	IBPR
Pearson Correlation	.585	.675	.555	-.425	.519	.657	.591	.686
Sig.(2-tailed)	.000	.000	.000	.000	.000	.000	.000	.000

Correlation analysis between QAMG and all other independent variables was studied, which revealed that QAMG has positive correlations with the other quality management practices. The highest correlation of QAMG is observed with TMSC r = 0.831, p = 0.000, and the lowest positive correlation of CEF r = 0.314, p = 0.001. The correlation between QAMG and quality performance indicators shows that QAMG has positive correlations with OPI r = 0.756, p = 000, SVOL r = 0.710, p = 0.000, RRATE r = 0.658, p =0.000, PRFT r = 0.628, p = 0.000 and MSHR r = 0.695, p = 0.000. Table 15 provides the correlation coefficients of QAMG with other studied variables along with p-value.

Table 15: Correlation Analysis of QAMG

Attribute	TWOK	TDE	RSET	TRS	QCOM	EMT	ICF	OCF
Pearson Correlation	.523	.510	.554	.583	.699	.618	.546	.453
Sig.(2-tailed)	.000	.000	.000	.000	.000	.000	.000	.000
Attribute	CNI	CPSS	ECPS	CRM	TCS	CFQT	CEF	FIA
Pearson Correlation	.575	.573	.507	.344	.481	.424	.314	.616
Sig.(2-tailed)	.000	.000	.000	.000	.000	.000	.001	.000
Attribute	QAMG	TMSC	SOT	DRWA	IQE	EEPW	TRIP	TREND
Pearson Correlation	1	.831	.786	.755	.674	.566	.703	.709
Sig.(2-tailed)		.000	.000	.000	.000	.000	.000	.000
Attribute	TRTEC	ADISC	DPRS	BENCH	OEN	OPI	QMTI	ESQM
Pearson Correlation	.619	.658	.738	.622	.682	.756	.738	.456
Sig.(2-tailed)	.000	.000	.000	.000	.000	.000	.000	.000
Attribute	SQCS	SVOL	COM	COS	RRATE	PRFT	MSHAR	IBPR
Pearson Correlation	.595	.710	.734	-.275	.658	.628	.695	.695
Sig.(2-tailed)	.000	.000	.000	.004	.000	.000	.000	.000

Discussion

The findings from the correlation analysis reveal that quality management techniques are correlated to each other positively except the change of supplier for poor quality, which is

negatively correlated to the other management techniques. The positive correlation between the variables shows that implementation of one techniques creates a favorable environment to adopt other quality management techniques. Further, it reveals that adoption of correlated quality management techniques reduces the documentation and planning of each technique as shared activities would be performed without duplication. The negative correlation of change of supplier for poor quality with other variables shows that frequent change of suppliers is not a productive activity and the mills, which are implementing quality management techniques, are usually not practicing it to improve the level of quality received from the suppliers.

Further, it is concluded that cotton yarn mills where teamwork approach is adopted by the workforce to deal with routine and special work related issues, have established the appraisal and rewards system based on the collective efforts rather than the individuals. The mills which have developed the training mechanism are equally distributing their resources towards providing the education in advanced technology, technical expertise and managing the organizational issues. Cotton yarn mills with customer-focused approach have also developed the mechanism to make needs and trends assessment of the customers, encourage the customers to provide feedback of product and services received, and utilizing the customers' voice as quality improvement tool for cotton yarn and yarn manufacturing processes. Cotton yarn mills, which provide healthy work environment to the employees, are observed to have an indiscriminative appraisal system, having a workforce empowered with a balance of authority against the job responsibility, and employees are appreciated to be innovative and creative for the development quality of yarn and the quality of yarn manufacturing processes. Cotton yarn mills, which considered the suppliers' contribution in yarn quality improvement significant, are using the statistical quality control techniques to monitor the supplier's quality management systems. However, cotton yarn mills, which are prioritizing the quality-oriented relations with supplier, are reluctant to have a frequent change of the suppliers in case of suppliers' failure in complying with the quality level. Cotton yarn mills, which are performing the benchmarking to evaluate the market trends, best industrial practices, and the competitors' strategies, are also implemented other quality management techniques to understand the industry trends. The role of top management in developing the congenial environment in the cotton yarn mills is significantly correlated with encouraging the employees to put suggestions for continuous improvement, setting the achievable goals for quality programs, and considering the quality as the ultimate goal of the organization. Cotton yarn mills, which have well established and documented work procedures are more efficient in communicating quality issues within the organization. Cotton yarn mills, which are investing in quality improvement programs, are also investing in the business process reengineering to realize the benefits of modern development in the industry.

The effectiveness of quality management systems is highly people oriented in the organizational context. An organization, having the workforce that is well trained, educated about the management systems, and foremost-motivated workforce to bring a productive organization change, is more likely to realize the benefits of implementation of quality management techniques. Considering the research findings, it is recommended

that management in the cotton yarn mills should emphasized on the development of learning oriented culture to make workforce aware of the quality challenges imposed by increasing competition in the market and the workforce should perform their role effectively to make the organization successful in achieving the high business performance.

Conclusion

Addressing the research question, how do quality management techniques interrelated in the work environment of the cotton yarn industry of Pakistan? This study concluded that quality management techniques are positively correlated to each other and adoption of a quality management practice facilitates the adoption of other practices. However, the practice of changing the suppliers because of their failure to provide the quality raw materials has significant negative correlation with the other quality management techniques implemented by the cotton yarn industry, which shows that changing suppliers frequently can negatively affect the quality management efforts of cotton yarn mills.

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