The Journal of Engineering Research (TJER) Vol. 14, No. 2 (2017) 145-155

Assessment of the Extent of Implementation of Quality Management System (QMS) and Cost of Quality (COQ) Concepts – A Case from a Developing Country

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Received 19 March 2017; Accepted 1 October 2017

Abstract: In developed countries, the application of the quality management system (QMS) is widely proven. However, in developing countries, like Pakistan, industries are not mature enough to understand and implement the system. The aim of this study is to examine the perception of quality, implementation of QMS and cost of quality (COQ) program in value-added garment sector, which is one of the major subsectors of textile industry in Pakistan. The methodology of the study is a questionnaire survey. The findings suggest that the majority of the respondent firms have well implemented quality management (QM) practices. Trend of results also depicts that most of the organizations wish to acquire ISO certification, which shows that the industrial processes are customer-centered thus striving to fulfil customer requirements. It can also be concluded that most of the organizations lack the COQ concept, its understanding and appropriate implementation.

Keywords: Quality management system; Cost of quality; Garment; Textile; Pakistan.

تقييم مدى تطبيق مفاهيم نظام إدارة الجودة (قمس) وتكلفة الجودة (كوق) – دراسة حالة من بلد نام

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الملخص : لقد ثبت تطبيق نظام إدارة الجودة (QMS) في البلدان المتقدمة على نطاق واسع. الا انه في البلدان النامية مثل باكستان ، فأن الصناعات ليست ناضجة بشكل كاف لاستيعاب وتنفيذ نظام إدارة الجودة (قريشي وآخرون ٢٠١٤). وتهدف هذه الدراسة الى الوقوف على مدى إدراك مفهوم الجودة وتطبيق برنامج نظامي إدارة الجودة (QMS) وتكلفة الجودة (COQ) في قطاع القيمة المضافة (الملابس)، والذي هو واحد من القطاعات الفرعية الرئيسية لصناعة الغزل والنسيج في باكستان. و تتبني منهجية هذه الدراسة على مسح استبياني. وتشير النتائج إلى أن غالبية الشركات التي اجابات على هذا الاستبيان لديها ممارسات جيدة في إدارة الجودة (QM). كما يظهر التوجه إلى أن معظم الشركات ترغب في الحصول على شهادة الأيزو، مما يدل على أن العمليات الصناعية تتمحور حول العملاء وبالتالي تسعى إلى تلبية متطلباتهم. كما يمكن أيضا استنتاج أن معظم الشركات تفتقر إلى وجود فكرة تكلفة الجودة (QMS)وفهمها والطرق المناسبة لتطبيقها

الكلمات المفتاحية : الجودة؛ نظام ادارة الجودة؛ تكلفة الجودة؛ ؛ الملابس , النسيج ؛ باكستان

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DOI: 10.24200/tjer.vol.14iss2pp145-155

1. Introduction

Changes in the dynamic business environment followed by intense competition require companies to thrive for existence and survival. Manufacturing companies' efforts to win any competition is directed towards "Quality". This scenario has also motivated manufacturing and service industries to employ methodologies like Statistical Quality Control (SQC), Total Quality Management (TQM), Total Productive Maintenance (TPM), Quality Management System (QMS), 5S and Kaizen, ISO 9000 quality standard and Six Sigma (Köksal *et al*. 2011). QMS provides a framework for the application of advanced methods of SQC, reliability engineering and Design of Experiments (DOE) (Bisgaard 2008). In order to grip the QMS framework, it is important to be familiar with the four pillars of QMS, namely Quality Planning (QP), Quality Assurance (QA), Quality Control (QC) and quality improvement activities (Purushothama 2011). Total quality improvement and its conservation is the key objective of every industry in present dynamic and intense competitive business environment. TQM is a well-known philosophy for improving business and operations activities of any industry through adopting QMS procedures and competencies. This process of evolution starts from inspection, moves towards QC and QA and finally approaches the philosophy of TQM. TQM is an approach of planning, organizing and understanding every activity of an organization and removing all the wastes from efforts and resources. As part of TQM, every organization must adopt QMS which ensures that two significant requirements – customer expectations and organizations requirements – are fully met.

The COQ program is one of the effective tools of QM. It measures the cost incurred in achieving a better and improved product or service quality. The implementation of a COQ program enhances the competitive advantage of the company and helps in being cost effective, both on long and short term basis.

Pakistan is the 4th largest cotton producer and 3rd largest cotton consumer in the world. The textile exports contribute 57% of the country's exports that stands Pakistan as the 8th largest textile exporter in Asia. Pakistan fulfils 9% of the global textile need and the is ranked in the world as the 10th textile producer. The textile industry of Pakistan is mainly based on locally grown cotton and has four subsectors namely yarn manufacturing, fabric manufacturing, textile processing and garment manufacturing. The garments sector contributes 48% of Pakistan's total exports, 30% of value-added in large-scale manufacturing and 40% of industrial employment.

Further highlighting the importance of this sector, it is pertinent to state that in 2013, the European Union (EU) granted Generalised System of Preferences (GSP) Plus status to Pakistan. The GSP Plus status would allow almost 20% of Pakistani exports to enter the EU market at zero tariff and 70% at preferential rates. EU trade concessions would benefit textile and garment industry most by enabling its products to compete with regional rivals like Bangladesh and Sri Lanka, which already have duty free access to the bloc's market. Furthermore, due to the rising labor cost in China (Lin 2012) and income rise in the large, fast-growing economies of China and India, the textile and garments export potential of the country would receive huge benefits (Hamid and Zafar 2014). However, in order to realize the export potential, textile and garment sectors need to realign their structure by adopting modern and effective methodologies.

It is observed that in developing countries, like Pakistan, industries are not mature enough to understand and implement QMS (Qureshi *et al*. 2014). Thus the aim of this study is to examine the perception of quality, implementation of QMS and COQ program in value-added garment sector, which is one of the major subsectors of the textile industry in Pakistan. For investigation, a questionnaire was designed according to the guidelines by Dillman (1991). The questionnaire comprised two sections: the first section gathered respondents' demographic information whereas the second one contained comprehensive questions to accomplish the objectives of the study described above. Three major cities, Karachi, Lahore and Faisalabad, were selected for the survey because the majority of textile industries are located in these cities.

2. Literature Review

Although TQM is not a new concept in the textile and clothing industry, it has received increased attention in the last few years (Maia *et al*. 2015). Being a part of TQM philosophy, an increasing trend of implementing QMS is observed (ISO 2013, Towers and McLoughlin

2005). It is widely accepted that QMS can be implemented in any organization regardless of size or type. Despite this benefit, organizations, like small and medium-sized enterprises (SMEs), hesitate to implement QMS due to cost and maintenance difficulties. In developed countries, acceptance and implementation of QMS is very high. On the contrary, in developing countries, there is a gap between actual and true implementation (Scott and Collins 1998). Towers and McLoughlin (2005) conducted a survey across UK based textile SMEs to study the effect of QMS on cost, quality and productivity. Two-thirds of SMEs considered QMS as a good contributor of increased customer satisfaction, awareness of quality and teamwork in organizations.

Different studies (Fatima and Ahmed 2005a; Fatima and Ahmed 2006, Fatima and Ahmed 2006b; Hasan *et al*. 2013; Shafiq 2012) have assessed the implementation of TQM in textile and garment sector of Pakistan and found that most companies have acquired ISO certification, but actual practices are still not being followed in real production environment. A survey study by Fatima and Ahmed (2005) on readymade garment industry observed that the segment was well aware of advanced QM concepts and enhanced product quality after adopting tools like Kaizen. However, new strategic directions based on modern management concepts should be adopted by organizations to increase the exports of readymade garments. Another survey study results revealed positive and significant effects of TQM practices on firm performance in Textile sector of Pakistan (Hassan *et al*. 2014).

Organizations seek to implement effective techniques that satisfy customer requirements. One of the most effective techniques that is used to measure the costs incurred in achieving high quality is the COQ program (Qureshi *et al*. 2014). COQ ensures improvement in quality and reduction in manufacturing cost by decreasing the defect rate (Desai 2008). Much work has been done on COQ to demonstrate its philosophy. Qureshi *et al*. (2014) summarize all definitions of COQ that have been referred to by different researchers in the last three decades. Correctly measuring and then reporting COQ is also a critical issue. There are different models which can be used to categorize, measure and report COQ. Omar and Murgan 2014; Schiffauerova and Thomson 2006) discuss these models along with cost categories and case studies indicating the implementation of COQ in different sectors. Regardless of the type of COQ model applied, accurate measurement is the key aspect that gives potential benefits to organizations. These benefits include highlighting the weak areas that require improvement, help controlling the overall quality and increasing firm's competitive advantage by decreasing cost (Yang 2008).

The philosophy behind COQ is now being understood and accepted in different organizations that include SMEs, different manufacturing and service industries and supply chains. Even in textile sector, estimating quality related costs is important as it helps to improve the overall quality and productivity of textile goods. But the aforementioned studies hardly discuss the implementation of the COQ program.

Integration of different tools and techniques enhances the effectiveness of tools further. This integration concept is widely used to enhance the effectiveness of QMS by integrating with lean manufacturing, Six Sigma and lean Six Sigma in manufacturing industries (Chiarini 2011; Karthi *et al*. 2011a; Karthi *et al*. 2011b; Karthi *et al*. 2012; Karthi *et al*. 2013). All these studies develop integrated models to improve the effectiveness of QMS with well-known tools like lean and Six Sigma. It is suggested that textile organizations in Pakistan should think beyond TQM and implement other tools and techniques such as lean manufacturing and Six Sigma (Shafiq 2012). Hussain *et al*. (2014) explore the application of Six Sigma methodology for reducing the defect percentage in fabric manufacturing sector. They found that by the suitable application of Six Sigma tools, the sigma level was improved from 2.2 to 3. However, the review of literature provides no evidence of any comprehensive study of COQ on textile sector of Pakistan.

The present study aims to assess the implementation of QMS and its effect on COQ. For this purpose, the garment sector of Pakistan has been investigated by the following objectives:

- To assess awareness of quality and QMS in the Pakistani garment industry.
- To assess the level of acceptance and implementation of QMS.
- To assess awareness regarding measuring COQ.
- To assess the impact of implementing QM practices on COQ.

3. Research Methodology

In order to address the aforementioned research objectives, data were collected from garment industry of Pakistan by developing a survey questionnaire. The questionnaire comprised two sections: the first segment gathered respondents' demographic information (Table 1), the second section contained comprehensive questions to accomplish the study objectives described above. In order to collect data, 153 garment manufacturing industries were selected from three main industrial cities of Pakistan i.e. Karachi, Lahore, and Faisalabad. Out of 153 questionnaires, 102 were returned and 72 were finally considered valid for analysis, giving a response rate of 47%. Data were analyzed using SPSS 22.

Before analysing the survey results, the GOF and reliability of dataset were assessed. χ^2 test to check the GOF and Cronbach's α to test the reliability of data were carried out. Table 2 shows the χ^2 test statistics for variables in discussion with a p-value indicating the significance. A value of 0.700 of Cronbach's α indicates that the reliability and internal consistency of the dataset are acceptable (Table 3).

Table 1. Respondents'demographics.

Characteristics	Category	Frequency	Percentage
Location	Lahore	27	38%
	Faisalabad	40	56%
	Karachi	05	07%
Gender	Male	47	65%
	Female	25	35%
Designation	General Manager / Senior Manager	04	06%
	Manager/Deputy Manager	13	18%
	Assistant manager	25	35%
	Officer/Trainee engineer	30	42%
Department	QC/QA	11	15%
	Production	17	24%
	Marketing/Merchandising	23	32%
	Industrial Engineering	21	29%
Industry (Type)	Knitwear	56	78%
	Denim/Woven	12	17%
	Others	04	06%
Total respondents		72	

Table 2. χ^2 - Test results.

Test Statistics			
	Chi-Square (χ^2)	df	p-value
Quality is related to product only	8.562	1	.003
Quality is every department's responsibility	65.575	3	.000
Quality is everyone's responsibility	38.000	2	.000
Have you implemented QMS?	8.562	1	.003
Did you find QMS effective?	27.597	1	.000
Did you benchmark for adopting QMS?	9.986	1	.002
Are improvements measured, recorded and displayed?	40.500	1	.000
Are you an ISO certified company?	3.959	1	.047
Do you measure COQ?	40.500	1	.000
Do you wish to measure COQ?	54.069	1	.000
Is your accounting system good enough for COQ?	9.058	1	.003
Do you think QM practices influence COQ?	99.658	3	.000

Table 3. Cronbach's α result.

Cronbach's Alpha	N of Items
0.700	14

4. Results and Discussion

According to the study objectives, the survey findings are described in five sections comprising awareness of quality; awareness of QMS; ISO certifications; Awareness of COQ; and ideas to implement COQ program.

a. Awareness of Quality

This section is designed to assess the respondents' awareness of their concept of quality. It is divided into two parts: perception of quality; and understanding of quality.

i. Perception of Quality

The respondents were first asked about their perception of quality and their responses are summarized in Table 4. The majority of the respondents (61%) perceived quality as "customer satisfaction," along with the degree of excellence (15%), fitness for use (7%) and conformance to customer's quality standard (6%). This shows that the conventional definition of meeting/exceeding customer satisfaction prevails in the study sample. This is because of the fact that the Pakistani garment industry mainly manufactures products for different customers according to their requirements and product specification. While a few industries manufacture products keep in view the end users, the fitness for use or degree of excellence were perceived by fewer respondents.

ii. Understanding of Quality

In the second part, the respondents were asked different questions to evaluate their understanding of quality. In response to the question, "Is quality related to product quality only?", the respondents were found to strongly agree (13%) or agree (28%) with this statement (Table 5). This, nevertheless, does not support the true concept of quality (Qureshi *et al*. 2014). On the other hand, a significant number of respondents disagreed (42%) or strongly disagreed (11%) with this statement. One reason could be that clothing industry focusses more on process quality to obtain the required/desired product quality. The respondents were then asked about the responsibility for quality. The results summarized in Table 5 indicate that the majority is in agreement with the concepts that quality is an organization-wide responsibility. However, it is astonishing to observe that 96% of respondents believe that quality is both individual and departmental responsibility, which is against the soul of TQM. TQM ensures that quality is not a departmental responsibility and true practices of the philosophy encourage everyone to play his positive role (Qureshi *et al*. 2014).

b. Awareness of QMS

The objective of this section is to evaluate the acceptance level of QMS in the garment industry of Pakistan. For this purpose, the section is organized in two parts: implementation of QMS; and perception of QMS.

Table 4. Respondents' perception regarding the term "quality".

Perception	Frequency	Percentage
Customer Satisfaction	44	61%
Degree of excellence	11	15%
Fitness for use	5	7%
Conformance to customer's quality standard	4	6%
Zero Defects	3	4%
Segregating of good one from bad one	3	4%
Continuous improvement with no end line	2	3%

Table 5. Respondent's understanding of quality.

Response	Quality is related to product only		Quality is everyone's responsibility		Quality is every department's responsibility	
	Frequency	%	Frequency	%	Frequency	%
Strongly agree	9	13	43	60	45	63
Agree	20	28	24	33	24	33
Disagree	30	42	4	6	3	4
Strongly disagree	8	11	1	1	0	0
Missing	5	7	0	0	0	0

Table 6. Implementation of QMS.

Response	Have you implemented QMS?		If "No", do you wish to implement QMS?	
	Frequency	%	Frequency	%
Yes	38	53%	30	94
No	32	44%	-	-
Missing	2	3%	2	6

Table 7. Significance of QMS.

Response	Did you find QMS effective?		Did you benchmark for adopting QMS?		Are improvements measured, recorded and displayed?	
	Frequency	%	Frequency	%	Frequency	%
Yes	55	76	35	49	62	86
No	12	17	36	50	9	13
Missing	5	7	1	1	1	1

i. Implementation Status of QMS

According to the results summarized in Table 6, 53% respondents claimed that they had implemented QMS in their organizations. While 44% did not implement QMS but they showed their willingness to adopt it. The survey (ISO 2013) also revealed that Pakistanis are far away from their regional as well as international competitors in the true implementation of QMS.

ii. Perception about QMS

In order to evaluate the respondents' perception of the benefits of QMS, the questions were asked about the effectiveness of QMS, display of improvement and benchmarking. Most of the companies (76%) found QMS as an effective tool (Table 7) and observed its positive impact on overall performance. This performance includes improvement in quality and process along with the implementation of standard methods and procedures (O'Neill *et al*. 2016). The respondents were further asked about whether or not they had benchmarked any organization for QMS implementation t. The results showed that almost 50% of the respondents benchmarked some organizations, while 50% did not. Benchmarking is a recommended activity that facilitates organizations to investigate their strengths and weaknesses by comparing them with the best organization. This practice enables organizations to learn useful things from the best, working in the same field, for improving their own performance (Barber 2004). As the firms claimed that they had well-implemented QMS, then they were recommended to benchmark other successful organizations or let other organizations benchmark them to learn from the best practices.

The findings also show that 86% of the respondent garment manufacturing firms displayed their improvements. QMS encourages such practices since they allow everyone to evaluate individuals as well as organizational performance. In garment manufacturing, where organizations depend much on human labour, such performance displays would create a competitive environment (Qureshi *et al*. 2014).

c. Status of ISO Certification

The objective of this section is to obtain the status of ISO certification in the garment

industry. The results are divided into two parts: ISO certified companies; and non-certified companies.

i. ISO Certified Companies

The results indicate that 63% of the respondents belonged to the ISO certified companies (Table 8). Among ISO certified companies, 64% were ISO 9001:2008 certified, which is a widely accepted quality program (Kim *et al*. 2011). However, some organizations (33%) were still not certified, which indicated that the significance of these certifications had not been properly understood by these organizations. Theoretical review suggests that the trend of acquiring ISO certifications in Pakistan has been increasing for the last 10 years, but this growth is still behind competitors like China and India (ISO 2013).

ii. Non-Certified Companies

However, among the non-certified companies, 52% showed their desire to acquire ISO certification (Table 9). 91% of them opined that ISO 9001 was the best-suited certification for their organization to meet customer expectations. However, by comparing this situation with the leading textile manufacturing countries, ISO 9001 has already been widely accepted (Fonseca 2015). Thus, there is a huge gap in implementing the ISO based QMS when compared with the rest of the world (ISO 2013).

Table 8. ISO certified companies.

Response	**Are you an ISO certified company?**		**If "Yes", which ISO certification do you have?**		
	Frequency	**%**	**Certification**	**Frequency**	**%**
Yes	45	63	ISO 9001:2008	29	64
No	24	33	ISO 14000	10	22
Missing	3	4	Others	6	13

Table 9. Non-Certified Companies.

Response	**Do you wish to get ISO certification?**		**If "Yes", which ISO certification would you go for?**		
	Frequency	**%**	**Certification**	**Frequency**	**%**
Yes	22	52	ISO 9001:2008	20	91%
No	-	-	ISO 14000	2	9%
Missing	2	5	Others	0	0%

Table 10. Measurement of COQ.

Response	**Do you measure COQ?**		**Do you wish to measure COQ?**		**Is your Account-ing system good enough for COQ?**		**Do you think QM practices influence COQ?**	
	Frequ-ency	**%**	**Frequ-ency**	**%**	**Frequ-ency**	**%**	**Frequ-ency**	**%**
Yes	9	13	56	90	21	34	54	75
No	62	86	0	0	37	60	4	6
Missing	1	1	6	10	4	6	14	19

d. Awareness of COQ

This section was designed to evaluate awareness of COQ. It comprises two main parts: measurement, categories and elements of COQ; and techniques to identify COQ elements.

i. COQ Measurement

In order to evaluate whether or not the industry under study had implemented COQ program, different questions were asked. The results are summarized in Table 10. Despite being familiar with the importance of this

program, the majority of the garment industry (86%) does not measure COQ. 13% of the respondents agreed that COQ was measured in their companies. However, even within this group, there was no evidence of true implementation as they could not describe their adopted COQ model. It was also highlighted that most of the companies (60%) did not have a proper accounting system for COQ measurement. Although 34% of industries mentioned that their accounting system was capable enough, it could only be evaluated when COQ program was fully adopted. These findings show that although garment industry of Pakistan seems aware of the importance of QMS and ISO certifications, COQ program is not properly/truly implemented in majority organization (Qureshi *et al*. 2014).

Furthermore, the results also show that 75% of the respondents observed a significant influence on COQ due to effective QM practices. Therefore, many clothing companies were informed of the strong relationship between QMS and COQ (Bisgaard 2008). Besides this analysis, it is important to observe that 90% of those organizations who did not measure COQ showed their willingness to implement the program in the future.

ii. Categories and Elements of COQ

The respondents were also asked about COQ categories and elements. Although a significant number (29%) did not respond, the rest of the respondents (71%) gave their suggestions that suit their organizational environment (Table 11). In the case of categories, the majority of industries would like to adopt PAF (Prevention, Failure and Appraisal) COQ categories (43%) followed by conformance/non-conformance (21%) and value added/non-value added (4%) categories. Although most of the respondents did not depict sufficient knowledge about COQ, the possible reason of selecting PAF model was due to its worldwide acceptance in most of the manufacturing industries (Su *et al*. 2009). On the other hand, Table 12 depicts that garment industry wants to pay more attention to internal failure (21%) and external failure (25%) costs. This shows poor understanding of COQ as recent researches encourage manufacturers to focus more on prevention and appraisal elements to reduce failure costs (Omar and Murgan 2014).

Table 11. Categories of COQ.

COQ Category	Frequency	%
PAF	31	43
Conformance and non-conformance	15	21
Value added and Non-value added	3	4
Others	2	3
Missing	21	29

Table 12. Elements of COQ.

COQ Elements	Frequency	%
Prevention	8	11
Appraisal	10	14
Internal Failure	15	21
External Failure	18	25
Missing	21	29

iii. Techniques to Identify COQ Elements

In the last part of this sub-section, the respondents were asked about the techniques to identify COQ elements as shown in Table 13. According to the respondents, Brainstorming (75%), Input/output analysis (72%), Benchmarking (65%), Fishbone diagram (56%) and Pareto analysis (49%) are the most commonly used techniques to identify COQ elements.

4.1 Implementation of COQ Program

In the last part of the survey, the respondents were asked to suggest their ideas for propagating awareness of COQ program in garment manufacturing industry of Pakistan. The suggested recommendations and ideas are summarized in four key statements (Table 14). According to the respondents, the reason behind the lack of implementation of COQ program is unfamiliarity with the method and cost element behind this concept. Thus, training programs must be initiated to familiarize people

with its benefits in terms of quality and process improvement. Since there are different types of COQ models, training will also help to select a suitable model according to the requirements of the industry. Respondents also highlighted that the implementation and training costs of such programs were high and hence normally top management avoided them. However, training programs could motivate people to realize and acknowledge the long-term benefits of implementing COQ system.

5. Conclusion

The aim of this study was to assess the extent of implementing QMS and COQ concepts in the garment manufacturing industry of Pakistan. For this purpose, a survey of garment sector was conducted keeping in view four objectives of this study as mentioned earlier. The findings suggest that the garment industry of Pakistan is well aware of the principles of QMS to develop and practice good quality culture. Moreover, the philosophy of TQM is widely accepted to standardize the methods and processes of garment manufacturing. Trend also depicts that most of the organizations wish to acquire ISO certifications, which shows that the industrial processes are customer-centred and thus they strive to fulfil customer requirements.

However, with reference to certain responses, it is also observed that the principles of QMS are not being followed in their true sense by some organizations. These companies wish to implement QMS for the sake of acquiring certifications only. The reason behind this narrow view is the extensive involvement of manpower in textile manufacturing processes that are not properly trained on QMS principles and procedures. This work also reveals that COQ program is not truly implemented in the textile and clothing sector of Pakistan. Most of the industries are aware of the importance of COQ and familiar with its models, along with COQ categories and elements. From the

Table 13. Techniques to identify COQ elements.

Techniques	Frequency	%
Brainstorming	54	75
Input/output analysis	52	72
Benchmarking	47	65
Fishbone diagram	40	56
Pareto analysis	35	49
Nominal group techniques	20	28
Others	2	3

Table 14. Suggestions and recommendations for implementing COQ program.

Respondents' recommendations	Frequency	%
Training programs of COQ must be conducted to highlight its real benefits	25	35%
Cost of training is higher and true practice is difficult to implement	18	25%
Garment industry should pay more attention to the true implementation of programs like COQ	11	15%
This is a powerful tool that will identify the expenditures that occur on quality at each stage in a production process	10	14%
No recommendation or idea suggested	08	11%

findings, it can be concluded that elementary knowledge of COQ system does exist along with the will to implement it, yet most of the organizations lack COQ concepts including understanding and appropriate implementation strategy. Thus, proper training and formal reporting are still to be familiarized for the true implementation of COQ program. Finally, respondents also recorded their ideas about promotion of COQ program. Although it is a bit of a costly process due to initial expenditures of training and execution, it will surely bring long-term benefits, not only for textile business, but also for other manufacturing and service industries.

Furthermore, the barriers and difficulties encountered in this exercise may also be investigated separately in the context of developing countries (Rasamanie and Kanapathy 2011). The findings of the study also suggest that existing accounting systems also represent one of the barriers in implementing COQ system. This study also highlights the gap that exists between textile industry of Pakistan and the market leaders of the world textile business in the context of QMS and COQ. However, a lack of a deeper and more comprehensive statistical analysis may be considered as a potential limitation of this study. Therefore, further work can be done with a larger sample size, adding other textile-rich geographical locations as well, packed with more rigorous statistical analysis will help to draw further conclusions on other dimensions of QMS and COQ program implementation.

Conflict of Interest

The authors declare no conflicts of interest.

Funding

No funding was received for this research.

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