

Integrated Simple Model for implementing CoQ Program

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Abstract

Though most of industries understand the importance of costs of quality, but they lack knowledge and resources to implement cost of quality program in their respective organizations. Hence to help those industries, the researcher proposed a integrated simple model for implementation of cost of quality program. The applicability of this model was tested in a industry situated in state of Punjab in India

Keywords

Cost of Quality, Cost of Quality Program, Quality Costs, SME's

I. Introduction

Managing quality costs begins with a general understanding and belief that improving quality performance, as related to product or service, and improving quality costs are synonymous [1]. CoQ (Cost of Quality) systems are becoming increasingly important as the emphasis on customer value and satisfaction continues to increase. CoQ programs by themselves do not improve quality. They provide input and feedback to quality systems which are responsible for quality improvements. CoQ programs should be part of any quality management program. Quality loss reduces with increasing process variance parameter and investment cost [2].

The purpose of the quality cost system is to provide a tool to management for facilitating quality programme and quality improvement activities. Quality cost reports can be used to point out the strengths and weaknesses of a quality system presently being adopted in the organization [3]. CoQ analysis links improvement actions with associated costs and customer expectations, and this is seen as the coupling of reduced costs and increased benefits for quality improvement. Cost of Quality directly impacts the overall financial goal of a company. Even a small reduction in COQ may boost the ROA of a company by a significant amount [4].

The difficulty lies in knowing how to measure these quality costs, and in understanding exactly what this information signifies once it is generated. In this context, the development and utilization of a formalized CoQ system that is integrated with the accounting, operations, and management functions of the organization should have significant operational and strategic utility. Training and education in quality management should employ a more focused approach to the introduction of the concept of CoQ [5].

CoQ programs provide a good method for identification and measurement of quality costs, and thus allow targeted action for reducing CoQ. A CoQ system provides a means for monitoring operational performance and identifying areas for improvement with respect to costs. While these were measurable quality costs, there were other costs such as loss of customers' good will which were hard, if not impossible, to estimate [6]. Quality cost accounting system is very useful to reduce failure or non-conformance costs associated with processes/ products [7]. Even though quality is considered to be an important issue, the CoQ approach is not fully appreciated by organizations and only a minority of them uses formal quality costing methods. No matter how great the interest of the academic community in CoQ models is, and how much theoretical information and

practical advice can be found, the situation in the real world is different. Companies rarely have a realistic idea of how much profit they are losing through poor quality. Smaller firms most often do not even have any quality budget and do not attempt to monitor quality costs [8]. Large companies usually claim to assess quality costs. Even though their managers claim that quality is their top priority, only a small number of them really measure the results of quality improvement programs. Even in companies that do measure results, quality costs were grossly understated [9]. Only 10–15% of Indian automotive organizations were using quality cost as a measure of their quality performance and thus losing an opportunity to identify critical areas for improvement [10].

The most frequent reason given for not tracking cost of quality was a lack of management support or absence of management interest in tracking such costs. The second most common response indicated that company economic conditions or status contributed to the lack of cost of quality tracking.

Many effective quality and productivity improvement tools and techniques are generally not finding a place in SMEs (small- and medium-sized enterprises) due to lack of knowledge and resources to implement them. For global competitiveness, this sector needs to enhance their quality engineering and management system and the cost of quality (COQ) techniques can definitely augment their endeavors in this direction [11]. Hence to full fill this gap, the researcher proposed an integrated simple model for implementing cost of quality programs in any organizations which have limited knowledge/ resources. Further the proposed model was tested with a real life case study in which cost of quality program was successfully implemented in a textile industry in India.

II. Model for implementing cost of quality program

An integrated simple model was proposed in Fig. 1 to implement cost of quality program in any industry. The model is named as integrated as it integrates various inputs like resources, organizational objectives, quality objectives etc and various steps required for its implementation. The different steps of proposed model were explained as under:

Step-1

First of all, in order to implement a Quality Cost program, an organization should constitute a Quality Cost Team for its successful implementation. The quality cost implementing team may have members from only quality assurance department or it may be multidiscipline team. The team should be well versed with various quality cost concepts. The various inputs for starting a quality cost program are:

- Top Management Support
- Organizational resources
- Quality Objectives
- Organizational Objectives

Step-2

The next step should be to decide about quality cost base. Total quality cost compared to an applicable base results in index which may be periodically analyzed in relation to past indices and peer industries. The base used should be representative

of, and sensitive to, fluctuations in business activity. Generally any one out of following bases is used:

- A labor base - such as total labor, direct labor etc.
- A cost base - such as shop cost, operating cost , or total material and labor
- A sale base - such as net sales billed or sales value of finished goods and services
- A unit base - such as number of units produced, the number of services performed, or the volume of output.

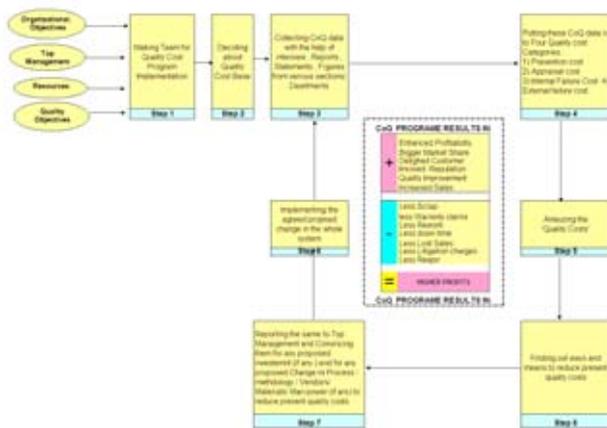


Fig.1: Integrated Simple Model for Implementing Cost of Quality program

However, Sales base is most commonly used, as this base is quite helpful in making presentations to top management.

Step-3

The next step shall be collection of data related to various cost of quality elements. These data might not be readily available. As many appraisal and internal failure costs are considered a normal part of operations. For that, these costs could be calculated with the help of various cost sheets , files , statements and interviews of different persons associated in different departments, In some cases, one may also estimate these costs (if needed).

Step-4

The next step in this regard shall be of putting these quality cost elements in following four types of quality cost categories:

- Prevention costs
- Appraisal costs
- Internal failure costs
- External failure costs

Step-5

In this step, the different quality costs collected in Step-4 should be analyzed. The data can be put in Excel spread sheet and different tools can be applied. Further, the presence of any trend (if any) can also be verified. The help of Pareto analysis can also be taken so as to find out those few quality costs which are responsible for majority of total quality costs. The quality costs should be calculated as percentage of previously decided base.

Step-6

In this step, different ways and means should be decided so as to reduce the present level of quality cost. Here, resources/

investment required for reducing quality costs and thereafter its impact on reduction of targeted quality costs should also be estimated. This is an important activity as any proposed investment / activity should be justified to management.

Step-7

Here present level of quality costs in terms of money terms like costs of quality in percentage of total sales, costs of quality in percentage of profits etc should be communicated to top management. Further, to reduce the present level of quality costs, all the proposed quality efforts along with their likely financial burden and proposed estimated savings in quality costs over a period of time should also be essentially mentioned. Top management should be convinced to give their acceptance for proposed changes/ investments so that in the long run net savings in quality costs will overshadow proposed changes/investments.

Step-8

In this step, changes approved by top management should be implemented in the whole system.

III. Benefits gained from Proposed Model

- Any organization whether it is micro, small, medium or large one can easily implement this model.
- It is closed model and favors continuous improvement.
- It does not need too much investment to implement this model
- It emphasizes importance of top management for successful implementation of cost of quality program
- Making team for cost of quality program will ensure its success.
 - This model will result in
 1. Enhanced Profitability
 2. Bigger market share
 3. Increased sales
 4. Improved organization reputation
 5. Delighted customer
- By implementing this model , organizations will have
 1. Less rework
 2. Less repair
 3. Less down time
 4. Less lost sales
 5. Less warranty claims
 6. Less litigation charges

IV. Case study

Profile of the organization

A case study was carried out in a textile industry located in Punjab (India). The organization was under process to acquire ISO 9000 certification . The industry was making various textile products . The turnover of the company was approximately 348 Lacs INR. Quality costing system was implemented in that organization by following the proposed model and the same was explained step-by step as under:

Step-1

In this regard, a cross functional team was constituted for implementation of cost of quality programme. The team had taken inputs from Top management,organizational objectives and quality objectives.

Step-2

The team decided Sale Base as indicator for determining the performance of Cost of quality programme.

Step-3

The team gathered expense data related to quality related actions of financial year 2009-2010 from different records / files/ statements / reports .Help of interviews of different personnel in the organization was also taken in estimation of certain quality costs.

Step-4

Later the cost of quality data was put under four different quality cost categories i.e. Prevention, Appraisal, Internal Failure and External Failure costs. The different quality cost data under categories of Prevention costs, Appraisal costs, Internal Failure costs and External Failure costs were shown as per Table-1, Table-2, Table-3 and Table-4.

Table1: Prevention Costs

Quality Cost Category	Amount (Rs.)
Salaries	384000
Quality Training	12500
Quality Administration	8500
Quality Planning	0
Total	405000

Table 2: Appraisal Costs

Quality Cost Category	Amount (Rs.)
Expense on in-process inspect	531000
Calibration & Maintenance Co	8000
ISO 9000 certification charges	20000
Total	559000

Table 3: Internal Failure Costs

Quality Cost Category	Amount (Rs.)
Wastage	1628411
Rejection	410062
Extra Operations	132000
Total	2170473

Table 4: External Failure Costs

Quality Cost Category	Amount (Rs.)
Discount	271800
Traveling Expenses	25000
Total	296800

Step-5

The cost of quality data was analyzed.It was found that the annual sales turnover of the organization in the financial year 2009-2010 was 348.11 Lacs INR. Further the profit of the organization was 3.61 Lacs INR. The ratio of cost of quality / Annual sales was calculated and found to be 9.85%.

Step-6

By observing cost of quality data and ratio of cost of quality / Annual sales, it was found that the present level of cost of quality was very high. The percentage wise break up of different

quality cost categories was found as under as per Fig. 2.

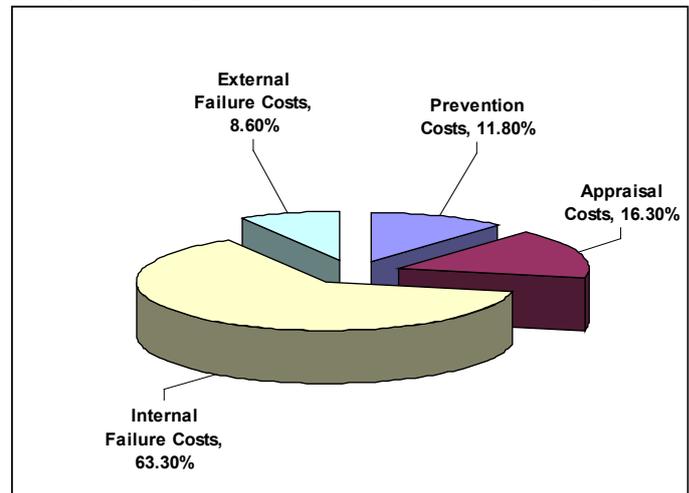


Fig. 2: Break up of quality costs

A pareto analysis was conducted on all the quality costs to help to point out quality cost categories which were responsible for major proportion of total quality costs and it was found that following types of quality costs were responsible for most of Total Quality Costs

1. Wastage
2. Expense on inprocess inspection
3. Salaries
4. Discounts
5. Rejection

Hence , instead of concentrating equally on all quality costs , The team proposed to concentrate more on these five quality costs as the scope of reduction was maximum in these five quality costs as compared to other costs.Hence by using less energy and resources the results can be much better.

Step-7

The quality cost implementation team proposed following actions:

- To increase efforts on quality training, quality planning and Vendor Evaluation, Development and ratings program
- To increase efforts to acquire ISO certification

Report of present level of cost of quality along with proposed changes to reduce the level of present quality costs was submitted to top management.

Step-8

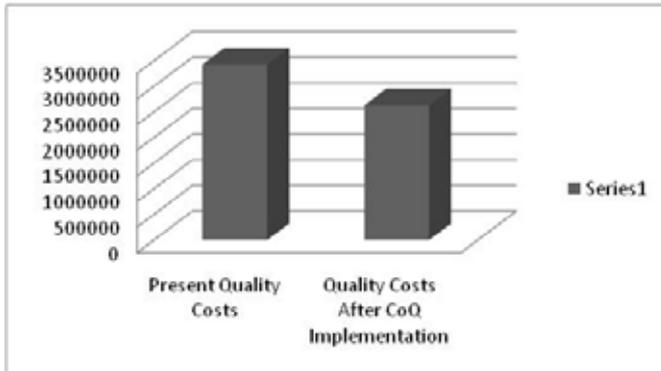
After getting acceptance/clerance from top management , the team Implemented the proposed changes in the whole organization.

V. Conclusion

The main aim of thie research paper was to propose a integated simple model for implementation of cost of quality programme in any industry. Hence to help micro, small and medium organizations, the author developed a model to implement CoQ programme in those industries. Another challenge before the author was to keep the model simple so that organization with average expertise in this field can implement this model.

The suitability of proposed model was tested on a real life textile industry. It was shown that with the implementation of proposed model, the total quality costs would decrease significantly. The calcauled quality costs and proposed quality costs were shown in table 5 as under.

Table 5: Present and Proposed quality costs



Hence it is concluded that this integrated simple model can be very useful to organizations attempting to implement cost of quality program and to identify those characteristics that may provide an opportunity to improve customer satisfaction.

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