

Cost of Quality

Murtadhi Hussain Alfayez

Abstract: The topic of the research talks about importance of cost of quality. Today most organizations are working in a competitive environment: they need to tackle and see off their opponents proactively. Every organization must choose for itself how best to attempt and compete in the market. A customer always likes a high-quality product that meets the expectations. In this manner, high quality just verifies that a product does what a client anticipates that it will do.

Keywords: Importance of cost of quality, high-quality product.

1. INTRODUCTION

Today most organizations are working in a competitive environment: they need to tackle and see off their opponents proactively. Every organization must choose for itself how best to attempt and compete in the market (Cole, 1999). Not all organizations think of the same answer and all things considered. To begin with, there are a few unique methods to gain a competitive advantage over rivals (Asq.org, n.d.). Also, organizations need to improve their qualities and not all organizations have matching qualities. Thirdly, several business sectors are divided and what is vital to one group of clients may be less critical to another group. So organizations need to choose which segment of the business sector they are focusing (Accountingformanagement.org, n.d.).

To gain a competitive advantage organization must pay considerable attention towards “quality” and related costs of its goods and services. The cost of quality is the cumulative expense of not making a quality items (Asq.org, n.d.). These costs can incorporate improving products and services, testing it, field management to make rectifications after products and services have been introduced to the customers, and supplanting a flawed item (Cole, 1999). This total expense is accounted for management to give them a foundation for guaranteeing that procedures dependably deliver to client desires (Cole, 1999).

A customer always likes a high-quality product that meets the expectations. In this manner, high quality just verifies that a product does what a client anticipates that it will do (Cole, 1999). In view of given definition, quality is not having the most astounding possible measures for making a definitive item (Asq.org, n.d.). Consequently, on the off chance that you demand to making a mahogany inside for a car’s glove box when the client just needs it to be sufficiently huge to store maps, then you have quite recently gone to extensive cost to make something that a client does not characterize as being of high caliber (Cole, 1999).

This perspective of quality implies that an organization can reduce any costs that clients have no quality discernments about (Asq.org, n.d.). The cost reduction can affect the large number of regions. For instance, it might be clearly worthy to utilize lower-quality or more slender materials, or to allow imperfections in ranges where clients can't see them, or to permit production at a lower resistance level that is as of now the case (Accountingformanagement.org, n.d.).

ISO 9000 is a series of five global quality norms. These measures fixate on the idea of documentation and control of nonconformance and change. ISO 9000 certification can be a necessity of working together (e.g., in Europe) (Cole, 1999). Likewise, numerous organizations have found that the procedure of requisitioning ISO 9000, while long and contemplative yield imperative advantages regarding self-information. U.S. organizations are utilizing ISO 9000 affirmation as a competitive device, too (Cole, 1999).

2. TYPES OF QUALITY

There are two different types of quality that an organization ought to be worried around, one of which starts in the designing division, while the other is the commitment of the whole association (Schiffauerova & Thomson, 2006). Types of quality are:

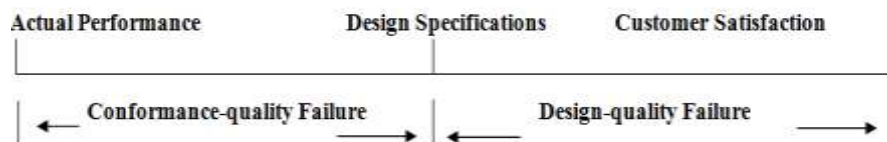
1. Quality of Design
2. Quality of Conformance

Quality of design:

The quality of design is the capacity of an organization to plan an item that fits in with the quality desired by the clients. As such, the quality that customers expect is designed for the products and services (Schiffauerova & Thomson, 2006). This kind of quality demands a lot of understanding of what architects think clients need, and how these wishes are integrated into the design of products and services. On the off chance that quality is not outlined in the fundamental structure of a product, there is no real technique to enhance the quality circumstance later, short of supplanting the item with another variant (Hornngren, Datar & Rajan, n.d.).

Quality of conformance:

This is the capacity of an organization to deliver products and services that comply with the design of an original product (Schiffauerova & Thomson, 2006). This sort of quality is not merely the duty of the production department; the procurement staff is responsible to buy quality materials, the delivery department is accountable to deliver the material without any damage, and the marketing department must impart the traits of the products and services that matter most to the customers (Hornngren, Datar & Rajan, n.d.).



Source: (Hornngren, Datar & Rajan, n.d.)

The given diagram shows the real performance of products and services delivered by the organizations. Actual performance can fall behind due to design quality failure and conformance quality failure (Hornngren, Datar & Rajan, n.d.). Financial together with non-financial factors linked to customers’ satisfaction, enhancing internal quality procedures, reducing defects, and the training and development of laborers are elements of quality (Hornngren, Datar & Rajan, n.d.).

3. THE COSTS OF QUALITY: THE FINANCIAL PERSPECTIVE

Financial dimensions involve areas influenced by the quality, such as revenues together with operational income growth (Schiffauerova & Thomson, 2006). Quality has a direct financial aspect that is the cost of quality (COQ). A Cost of Quality (COQ) builds a graph showing counteractive action, appraisal cost, and failure costs (Schiffauerova & Thomson, 2006). The Cost of Quality can be described as the expense that is partnered with the nature of a product. It is the aggregate of expenditures, which is spent on keeping up quality up to standard levels also to the cost of inability to maintain that level (Schiffauerova & Thomson, 2006). The costs can be divided into four different categories;



PREVENTION COSTS:

The prevention cost that assures that the organization meets the requirements of the customers (Schiffauerova & Thomson, 2006). The prevention cost is connected with the maintenance of quality systems, for example, quality control frameworks (Schiffauerova & Thomson, 2006). These costs are incurred during or before production to avoid deficient units of yield (Accountingformanagement.org, n.d.). The appraisal costs are essential costs for the prevention of errors. By a wide margin, the ideal way an organization can spend its Cost of Quality dollars is to put resources into preventive activities (Schiffauerova & Thomson, 2006). Lamentably, many organizations have ignored this profitable investment due to troubles in recognizing the downstream returns (Schiffauerova & Thomson, 2006). Examples of appraisal costs are;

- Training and education of quality
- Team meetings for quality improvements
- Evaluations of process capabilities
- Supplier capability survey
- Review of new products
- Quality planning

APPRAISAL COSTS:

The appraisal cost is the cost that is incurred to guarantee the work procedures are producing yields that congregate customers' requirements, for example, the examination of crude materials (Accountingformanagement.org, n.d.). The term refers to both internal and external customers (Accountingformanagement.org, n.d.). The appraisal cost is spent after production, yet before sales, to differentiate faulty products (Accountingformanagement.org, n.d.). Examples of appraisal costs are;

- Testing of purchased material
- In-process testing
- Final testing
- Process, product or administration reviews
- Adjustment of measuring and test hardware
- Related supplies and materials

EXTERNAL COSTS:

External costs/failure costs are that signify lost benefits connected with not meeting external customers' needs or prerequisites (Accountingformanagement.org, n.d.). On the off chance that the external customers are disappointed with an organization's offerings, they are prone to give back the item, not purchase from the firm again and, all the more significantly, and inform other potential customers regarding their experience (Accountingformanagement.org, n.d.). The expense of lost open door, in this way, organizations lost benefits from the cancellation of orders by the customers (Accountingformanagement.org, n.d.). Examples of external/failure costs are;

- Returned or rejected orders
- Modified or cancelled orders
- Unsatisfactory customer services
- Product liability
- Loss of customers due to poor quality
- Approved repairs past guarantee

INTERNAL COSTS:

Internal costs do not meet customers' requirements, for example, the expense of doing same work again and again (rework). Internal costs are very easy to recognize because some accounting frameworks can track them (Accountingformanagement.org, n.d.). Internal costs are incurred to settle or discard the deficient items before they are put on the market. Examples of internal costs are;

- Scrap
- Modify or repair
- Inconvenience shooting
- Re-investigate and re-testing

Quality costs can emerge anywhere in an organization. There may be product outline issues that start in the engineering department, and also manufacturing issues that can produce defective products (Cole, 1999). The purchasing department may procure substandard material that may cause product flaws. Further, the order taking department may enter an incorrect order of a customer into the system that may cause delivery of a wrong item (Cole, 1999). These issues end up in quality costs (Cole, 1999).

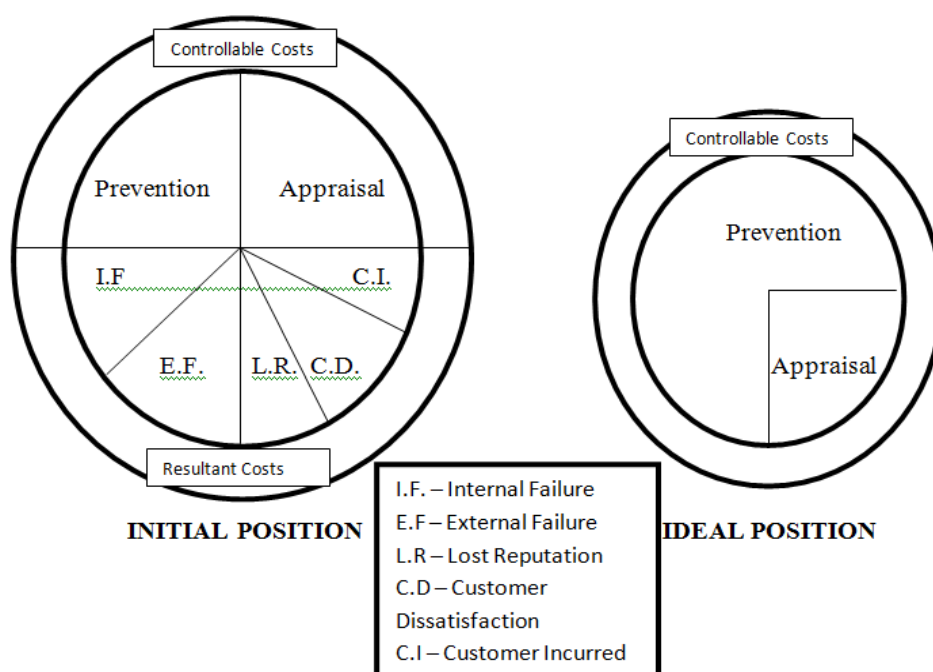
Quality costs can embody a noteworthy part of the aggregate costs of a business; however they are covered up inside of the standard cost accounting system of a company, which is situated more toward recording by responsibility center than by quality issue (Cole, 1999). The moderation of quality issues can incredibly expand the productivity of an organization, and additionally improve the level of client satisfaction (Cole, 1999).

4. DEVELOPMENT STRATEGY USING COST OF QUALITY (COQ) DATA

The cost of quality (COQ) is valuable as an evaluation instrument. This information can be utilized adequately to distinguish and organize change opportunities and after that, once a change is made, track the effect of the change (Zimwara et al., 2013). The methodology for the using cost of quality information for development is to fight the failure costs and drive them to zero (Zimwara et al., 2013). Executing this system will bring about critical thinking and enhancing or changing the procedures that create the products and services (Zimwara et al., 2013). The cash spent on research and rectify the issues that result in the failure costs are anticipation dollars. By catching these dollars, the organization can focus how everything adds up an advantage of mining the failure costs (Zimwara et al., 2013).

The activities related to appraisal costs should be minimized, as they don't add value. They are characterized as non-value added as they don't change the nature of the product and service being assessed (Zimwara et al., 2013). The more reviews or checks directed, the more improbable low quality will be dispatched to the customers; however these activities don't keep low quality from being delivered (Zimwara et al., 2013). By spending more cash on prevention activities, appraisal activities can be decreased, and this ought to likewise prompt lower failure costs. A Cost of Quality Model is demonstrated in Figure given below (Zimwara et al., 2013).

Cost of Quality Model



The initial position is demonstrated on the left, and the ideal position is indicated on the right side (Schiffauerova & Thomson, 2006). The initial cost of the quality model comprises of both controllable expenses: prevention and appraisal and resultant expenses: internal and external failure, C.I, C.D, and L.R costs (Schiffauerova & Thomson, 2006). A perfect example has zero failure costs (Schiffauerova & Thomson, 2006). By reducing the failure costs, the client incurred, and consumer dissatisfaction and lost reputation cost would likewise be zero (Schiffauerova & Thomson, 2006). All expenses would now be controllable: prevention and appraisal with counteractive action being bigger than appraisal (Schiffauerova & Thomson, 2006). The proportion of opposite action to appraisal would be extremely reliant on the sort of business involved (Schiffauerova & Thomson, 2006).

5. ANALYZING QUALITY PROBLEMS AND IMPROVING QUALITY

There are three different techniques to analyze quality issues and improve quality:

Control Charts:

Control charts are utilized to screen quality in a routine. Contingent upon the amount of methodology class to be tried, there are two major sorts of control diagrams (Asq.org, n.d.). The first is referred to as a univariate control chart (Asq.org, n.d.). A control chart is a graphical presentation (diagram) of quality trademark (Asq.org, n.d.). The second type control chart is referred as a multivariate control chart that is a graphical presentation of a measurement that condenses or speaks about quality brand (Asq.org, n.d.).

Pareto Chart:

A Pareto chart is a structured presentation (Asq.org, n.d.). The bar height represent to recurrence or expense (time or money) and are organized with longest bars on the left and the briefest to one side. Along these lines, the diagram outwardly delineates which circumstances are more critical (Asq.org, n.d.).

Use of Pareto Chart:

- Pareto chart is used at the point when analyzing data related to recurrence of issues or causes in a course of action (Asq.org, n.d.).
- It is also used at the point when there are many issues or reasons and the organization need to concentrate on the most striking issues (Asq.org, n.d.).
- The chart is used at the point when analyzing expansive causes by taking a gander at their particular division (Asq.org, n.d.).
- Pareto chart is used at the point when speaking with others about your information (Asq.org, n.d.).

Cause-and-Effect Diagrams:

Cause-and-Effect Diagrams was concocted by Kaoru Ishikawa, a pioneer of quality management, in the 1960s (Asq.org, n.d.). It is referred as Ishikawa or Fishbone Diagram (Asq.org, n.d.). The fishbone diagram distinguishes many possible foundations for an issue (Asq.org, n.d.). It can be used to structure a brainstorm to produce new ideas. It promptly sorts thoughts into valuable classes (Asq.org, n.d.).

Use of Cause-and-Effect Diagram:

- At the point when recognizing conceivable reasons for an issue (Asq.org, n.d.).
- Particularly when a group's reasoning has a tendency to fall into trenches (Asq.org, n.d.).

Cause-and-Effect Diagram Steps:

Step 1: To begin with, record the accurate issue you confront. Where suitable, recognize who is included, what the issue is, and when and where it happens (Asq.org, n.d.).

Step 2: At that point, compose the issue in a case on the left side of a substantial sheet of paper, and sketch a line over the paper evenly from the crate(Asq.org, n.d.). This course of action, resembling the head and spine of a fish, provides a space to create thoughts (Asq.org, n.d.).

In the given example organization is facing loss due to poor quality of products and services (Asq.org, n.d.).

Step 3: Identify major factors involved

In step 3, identify major causes of problem. The causes can be material, internal and external forces, and systems, procedures, and staff members (Asq.org, n.d.). Brainstorm to find as many causes of the problem. Then, draw a line "spine" of cause-and-effect diagram for every cause and label each line (Asq.org, n.d.).

Step 4: Identify all possible causes of the Problem and Analyze (Asq.org, n.d.).

For every major problem, there are possible causes such as material can be of poor quality, material can be damaged during transportation etc (Asq.org, n.d.).

Demonstrate these possible causes as shorter lines falling off the "bones" of the diagram. Where a reason is huge or mind boggling, then it might be best to separate it into sub-causes. Demonstrate these as lines falling off every cause line (Asq.org, n.d.).

By this stage organization ought to have a chart demonstrating the greater part of the conceivable reasons for the issue that it can consider (Markarian, 2004).

Looking at the complexity and importance of the issue, organization can further investigate the causes of the problem (Markarian, 2004). This may include setting up examinations, conducting surveys, et cetera. These will be intended to test which of these possible reasons is really adding to the issue (Markarian, 2004).

Six Sigma Quality:

Six Sigma is a high disciplined process that helps organizations focus on developing and delivering close immaculate items also, benefits (Sixsigmabasics.com, n.d.). The word "sigma" is a factual expression that measures how far a particular process goes amiss from excellence (Sixsigmabasics.com, n.d.). The important thought behind Six Sigma is that in the event that an organization can gauge what number of "deformities" it has in a procedure, organizations can competently make sense of how to dispense with them and get "zero imperfections" (Sixsigmabasics.com, n.d.).

Key Concepts of Six Sigma:

Six Sigma has key concepts;

- Six Sigma is important to quality and what key attributes of a product are critical to customers (Sixsigmabasics.com, n.d.).
- Defect: Neglecting to convey what the client needs.
- It measures process capabilities. What an organization process can deliver?
- Variation: What does a customer observe and feel about products and services (Sixsigmabasics.com, n.d.).
- Stable and smooth operations ensure consistency and predictable processes improve what the customers observe and feel about products and services.
- Design for Six Sigma: Design to address client issues and procedure capacity (Sixsigmabasics.com, n.d.).

6. ADVANTAGES OF COST OF QUALITY (COQ)

Recognizing Cost of Quality can have a few advantages:

- It gives a standard measures across the organization and additionally between organizations (Schiffauerova & Thomson, 2006).
- It manufactures attention to the significance of quality.
- It distinguishes change opportunities.
- Being an expense measure, it is helpful at shop floor and at administration (Schiffauerova & Thomson, 2006).

7. USING COST OF QUALITY TO IMPACT ON END PRODUCT

The failures occurring within the organizations don't have the same financial impact on an organization (Zimwara et al., 2013). As expressed before the external failure has a higher need as they cause extra expenses to your clients, which will affect their future buying behavior and decision power. Potential future clients will likewise be affected because those customers educate different organizations regarding their issues and a percentage of the groups they tell won't purchase as

a consequence of that problem (Zimwara et al., 2013). By deciding a standard or average expense for every kind of failure, it is likely to select and organize failures to support fundamental business objectives (Zimwara et al., 2013). The primary step to setting up a standard cost is to list down all the critical activities as a consequence of the failure, for example, recovering the faulty item from the client, delivering a substitution item and after that getting it to the customer (Zimwara et al., 2013). There are different other exercises required they are excessively diverse; making it impossible to list however ought to be a piece of the expense calculation (Zimwara et al., 2013). When the total of all activities has been documented an expense of every movement is included, and each cost is then completed. This expense reproduced by the recurrence of the specific failure levels with the aggregate yearly cost (Zimwara et al., 2013).

8. CONCLUSION

In conclusion, the projects chose for development should be connected with the more extensive business objectives. The business objectives may be lower expenses, enhanced productivity or expanded market share. The external failure that has the greatest effect on the company goals ought to be chosen for development. Critical thinking exercises must be completed to focus the main drivers of the failure. An answer should then be determined and executed. Confirmation of what matters effect can be controlled by Cost of Quality information gathering.

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