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The Model of Iceberg of Costs

Mirela DOGARU *¹, Valentina ZAHARIA²

Abstract

Many of the quality costs are hidden and difficult to identify by the usual assessment systems. The model of the iceberg of costs is very often used to illustrate this issue: only part of the costs of higher and lower quality are the obvious - those drawn in the face above the water level. Identification and improving these costs will significantly reduce the total cost of activities. In the trilogy, according to the planning phase, once the operations are launched, most of the time, 20% of the activities must be resumed due to the deficiencies of quality. Even in this situation, the process may be out of control (supposedly the activity will be resumed in a proportion of 40%) and must be brought back within the limits of control by taking appropriate measures. After a period of time, by implementing the improvements of quality (the third step of the trilogy), chronic loss may be reduced to a much lower level. Thus, quality control ends to be regarded as a component element of all phases of the production process, from the detection of market requirements, design, design, achievement, and until the product's product to the customer. Improving quality must be continuous and progressive, focus on long - term objectives trying to reach the progress of quality so that the firm will pass on a new level of performance.

Keywords: *quality; cost; quality improvement; quality control.*

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1. Introduction

Many of the quality costs are hidden and difficult to identify by the usual assessment systems. The model of the iceberg of costs very often used to illustrate this issue: only part of the costs of higher and lower quality are the obvious - those drawn in the face above the water level. Identification and improving these costs will significantly reduce the total cost of activities. In the trilogy, according to the planning phase, once the operations are launched, most of the time, 20% of the activities must be resumed due to the deficiencies of quality. Even in this situation, the process may be out of control (supposedly the activity will be resumed in a proportion of 40%) and must be brought back within the limits of control by taking appropriate measures.

After a period of time, by implementing the improvements of quality (the third step of the trilogy), chronic loss may be reduced to a much lower level.

2. Theoretical Background

Juran pleaded for a four-step process of developing the custom of quality:

- Setting specific targets.;
- Setting up footsteps for achieving the objectives;
- The award of clear responsibilities for the planning of planning;
- Rewards based on results.

Juran is well known for creating the concept of quality trilogy: Quality Planning, quality control and quality improvement.[1]

The first stage of this trilogy, the quality planning, it is necessary for firms to identify customers, their requirements, develop the characteristics of the product corresponding to such requirements and to establish priority objectives. The processes must be created and dimensioned to ensure that quality standards can be met.

The second step of the trilogy, quality control, establish what needs to be controlled, the measurement units to assess the data objectively, performance standards, measures the real performance, interpret the difference between the real performance and the Standard and, finally, apply corrective action over differences. This step highlights the use of the statistical controlling methods to ensure that quality standards are met and to identify variations from them.

The third stage and the last of the trilogy is improving the quality. Improving quality must be continuous and progressive, focus on long - term objectives trying to reach the progress of quality so that the firm will pass on a new level of performance. [1]

3. Argument of the paper

In the trilogy, according to the planning phase, once the operations are launched, most of the time, 20% of the activities must be resumed due to the deficiencies of quality. At this point, manufacturing procedures cannot eliminate chronic loss (result of quality deficit planning).

Even in this situation, the process may be out of control (supposedly the activity will be resumed in a proportion of 40%) and must be brought back within the limits of control by taking appropriate measures. After a period of time, by implementing the improvements of quality (the third step of the trilogy), chronic loss may be reduced to a much lower level.[3]

4. Arguments to support the thesis

Along with Deming, juries pointed out that, for the implementation of continuous improvements, employees must be regularly trained in the use of appropriate methods.

Whatever their managerial guidance, all the managers recognize Juran today as one of the leaders of the quality management, and its contributions to the development of techniques and general principles accepted have had a significant impact on how the quality is given today.[1]

The creator of Total Quality Control is considered the American business expert and the American affairs, Armand v. Feigenbaum (1922 - 2014). In the year 1961, in his "total quality control, published in New York, he presented his own quality principles in 40 paces. Feigenbaum has adopted the quality of a complete system, promoting the idea of a working environment where the quality developments are integrated throughout the organisation, management and employees are fully involved in improving quality, learning from their own successes. This philosophy was adapted by the Japanese and called "quality control at the whole firm.[4]

5. Arguments to argue the thesis

The definition given by Feigenbaum quality is interesting because it takes into account other departments other than the production, which

contributes to the quality of products and services manufactured and provided by the company to meet the expectations of the client.[4]

Subsequently, in a series of published articles, Feigenbaum shall plead for a systemic or total quality approach, demonstrating the need to involve all of the functions of the firm in the process of the quality.[4]

By underlining the administrative nature and considering human relations as the basic element of the activities of quality control, Feigenbaum has changed the vision of up to the quality of time, regarded more as a technical method, in one close to reality that of quality regarded as a method of trade in business.

Thus, quality control ends to be regarded as a component element of all phases of the production process, from the detection of market requirements, design, design, achievement, and until the product's product to the customer.

From Feigenbaum's point of view, quality is regarded as becoming the only most important force that can lead to the success of the company and to increase its influence on national and international markets.[4]

As a conclusion of the 10th century research year, Fegenbaum sub - line: 'quality is essentially a manner of organisation, becoming, as finances and marketing, an essential element of modern management.

Professor Japanese, Kaoru Ishikawa (1915 - 1989) is considered the promoter of the quality of quality in Japan from the early'60s. The first "Circle of quality was established inside the Nippon Telegraph and telephone public corporation, and, since then, the use of these circles has been extended into the banking and retail sales. In the'70s this concept was exported to Europe and us, but it was not very successful as Japan.

The specific culture of their Japanese, the Japanese see in creating the quality of quality requirements of the following goals:

Contribution to improving and development of the company's activities;

Compliance with human relations and creating an environment to provide employees' satisfaction;

The development of human capacity and removal to light of the infinite potential of each employee.[5]

In parallel, Ishikawa has made his attention to statistical techniques and intruders used in the work of these circles. Thus, he is well known for the creation of a quality instrument called the cause - effect diagram, Fishbone chart or Ishikawa diagram. This chart is used to resolve quality problems, as a systematic tool for the discovery, sorting and documentation of the causes of quality variation in the production process level.[5]

The main elements of Ishikawa's philosophy are represented by:

- The first step of quality is the knowledge of the requirements of customers;

- The ideal state of quality control shall be produced when the inspection is no longer required;

- Eliminating primordial causes, not the symptoms.;

- Quality control is the responsibility of all employees and all department;

- Means should not be confused with objectives;

- Quality must first be put, and the firm's orientation must be to the long - term profits.

- The pyrea is the launch ramp and the way of the quality of quality;

- The top management shall not be treated with anger when subordinates present the facts;

- 95% of the problems may be solved with specific instruments of the problems;

Data that are not accompanied by information about dispersion (variability) are false data.[1]

Fishbone chart ("bone of fish") is known as the cause - effect chart. The analysis of the generators or the Ishikawa chart: This chart is a structured format of a brainstorming process using graphic means to link the causes of a problem itself, in other words, to determine the cause and effect. The chart is more focused on the causes than on the effect.

Because there may be more causes for a certain problem, this technique helps to identify the main cause of the problem in a structured and simple manner.

There are two sets of generic causages of the main causes used in Fishbone diagrams: 3m1p - method, machinery, materials and papcholes (method, machine, materials and people) or 4p - polymers, procedures, people and plant (policies, procedures, people and enterprise).[3]

In General Fishbone chart can be used in the following types of situations:

- To analyse and discover the cause of a difficult problem;

- When there are several possible causes of a problem;

- When traditional ways of approach the problem (test and error, the test of all possible causes, etc.) consume time and resources important;

- When the problem is very complicated and the team can't determine the cause of generators.

One of the main instruments used to determine the elements that provokes Major problems and to enumerate them as major causes of Fishbone diagram, it is the Pareto Principle. With Better than a century ago, in 1906, the Italian economist Vilfredo Pareto designed a mathematical

formula to explain the inegal distribution of wealth among the Swiss.**Error! Reference source not found.**

He noted that 80% of the total Switzerland was owned by only 20% of the inhabitants. Although the principle was initially applied in the economy, time became extremely popular in the explanation of reason behind the problems of other industries.

The Pareto Principle is also mentioned as rule 80/20, a rule that is actually empirical and absolutely not. Using the rule and pareto diagrams, when initial data is analysed (Gross) of any problem, it shall be obtained with information which supports the decision making process. **Error! Reference source not found.**

In conclusion, concern does not represent an exact figure as long as the rule and the specific charts are a support in the identification of key factors. Some of the situations where the Pareto Principle is used are represented by:

- 80% of the complaints of customers are caused by 20% of the product or services of a firm;

- 20% of the duration of a business meeting resulting in 80% of its value;

- 20% of the products or services of a firm generate 80% of its profitability.[9]

In most situations the Pareto Principle is used in cases like:- Identifying those several components that produce most of the problems in a system;

When available data are too few to identify those components that cause the majority of problems, a mathematical method (statistical) is required to identify them.

Correlying the organisation of the company's control company, Ishikawa has grouped specific statistical methods (Pareto diagrams, the cause of the cause, the crooks, the Histograms, the sheets and the diagrams of control sheets, the dispatch of the dispatch and the verification lists) in three categories, and the intermediate and advanced methods are intended for specialists, and the elementary methods must be subject to the entire staff of the firm. [11]

Ishikawa was one of the first specialists who emphasised the importance of quality control at the entire firm, rather than simple concentration on products and services. As regards organisational contribution in the area of quality, Ishikawa is associated with movement of quality control at the level of the company, initiated in Japan in the 1955 - 1960, involving participation in quality control of all members of the top management firm until the employees of all levels of the lower levels.[5]

Dr. Ishikawa built his theories on the belief that all the firm's employees must be united by sharing the same visions and a common goal. It also stressed that the quality initiatives should be followed at every level of the organization and that all employees must be involved.[5]

The theorists and the Japanese management consultant, Masaaki Imai, has reunited the main theories and philosophical intruders in one concept, Kaizen, and published in 1986 working with title "kaizen: Japanese spirit of Improvisation.[12]

In Japanese the word kaizen means "continuous improvement and iii assigned it to the book of three guidance principles:

- The process of procedure on the system;
- Stress is generated by the people involved in the process;
- The constant feeling of rapid action.

Masaaki Imore declared in 1986 that the starting point of improvement process is the need for need. This is happening with admission of a problem. If no problem is recognised, there is no recognition of improvement needs.[12][7]

In another statement, in 1996, Masaaki is more declared that kaizen means improving the help of all the involved, and necessarily with small cost.

When the kaizen concept was first published in 1986, many American products were of poor quality, and the products originating in Japan were making the American market share in dizziness. From that moment on, American companies have made remarkable progress to improve the quality of products, and a large part of the contribution is implemented the principles of kaizen, which include the manner of Total Quality'. A major contribution to the quality management has also had the American businessman, Philip B. Crosby (1926 - 2001).[12]

This, occupying important positions in the area of quality control in the company Martin Company and itt Corporation, launches after 25 years of practice in 1979, the book called "quality is free, where the concept of "zero malfuncts applied in companies in which the four main quality elements of the quality are concerned:

- Quality is defined as "compliance with the requirements and "No good thing;
- The quality of quality is prevention and not the assessment;
- The performance standard is "zero defects and not "approximately;
- Quality measurement is the price of non - compliance and not a sign.

Crosby's definition may be in contrast with often known as a product or service which complies with specifications, implies that

specifications can be regarded as a quality element. Compliance with the specifications implies that the specification, where it is fulfilled, will also fulfill the client's requirements.[12]

It is clear that if a market research is flawed or based on old data, the products/derived services in this research are unlikely to satisfy the requirements of clients, no matter how many the specifications are concerned.

In Crosby's vision, the concept of "zero malflats means" not that people will ever fail, but that the firm will not begin its work waiting for them to be wrong. It considers traditional control of quality and acceptable quality limits more than on failure than as instruments and methods which ensure success in the application of quality. [12]

Therefore, Crosby defined the quality as "compliance with the requirements laid down by the company for its products on the basis of the requirements of the customers'.

The methodology of the engineer and the Japanese statistician Genichi Taguchi (1924 - 2012) puts more emphasis on the practice of the product optimisation and the process before the manufacture rather than the achievement of quality through inspection, and concepts such as quality and reliability are pushed in the design stage. The method shall provide an effective design technique of the product tests before the production phase initiation and may be used as a method of detection of defects for the resolution of all factories.[15]

Conclusions

In fundamental manner a prototype method, Taguchi's methodology allowed engineers and projectors to identify the optimal framework to achieve a robust product that can achieve the functionality required by the client.

Taguchi had an important impact on the current vision of quality costs. It stressed that traditional vision, the costs of conformity with specifications, is incorrect and proposed another way to look at these costs.

Taguchi created the so called "quality engineering which means an approach involving the relation of engineering with statistical methods to reduce costs and improve quality by optimising the design of the product and manufacturing processes. [15]

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