

Conflicts between Quality Management Methods

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Abstract: Development and employment of quality management methods contributed substantially to the competitive capacity of products. Nowadays, each employee of an organization should know quality management methods, otherwise organization management cannot achieve its optimal effectiveness. Experience of long-term employment of quality management methods resulted in development and enhancement of the methods, their adaptation to modern production and even their integration into equipment. But the large number of methods leads to the increased requirements to them. One should be aware that methods are limited in their application and efficiency and can be mutually conflicting. In fact, we can speak about competitiveness of methods. Since a manager has limited time and resources, he/she cannot apply all the methods simultaneously and should make the right choice. To choose an appropriate method, one should be aware of the advantages of a method, as well as of possible conflicts which its use can cause.

Keywords: quality management methods, conflict of management methods.

I. INTRODUCTION

Application of quality management methods at enterprises contributes to its competitive capacity increase. All managers have certain experience of employing such methods, but the expected results from using them do not always correspond to the actual results. We tried to analyse the cause of the problem. There are many quality management methods, for example Pareto chart, Shewhart control charts, capability index etc. Each method provides a positive effect such as defect reduction, productivity increase or competitive advantage. Nevertheless, method use often results in a conflict. For eliminating this problem, we need to define the types of conflicts and their possible causes.

II. TYPES OF CONFLICTS

First, we will describe the types of conflicts which can occur when using different quality management methods. Levels of conflicts:

- Conflict of the application results. It can occur when one method tells that the specific result is positive, whereas another method tells that the result is negative.
- Conflict of suggested solutions. It occurs when one method suggests personnel change whereas another method suggests equipment change.
- Conflict of normative documents. It occurs when a procedural error is inherent to a specific standard.
- Conflicts of use:

- Conflict at the departmental level. It occurs when different departments use different quality management instruments (for example, a turner uses a control chart, while an inspector uses a capability index).
- Conflict of priority. It relates to the question which instrument should be used first, for example Ishikawa chart or Pareto chart; or which method of lean production should be implemented first.
- As to the lean production methods and so-called 20 keys, they contain possible conflicts of simultaneous use because one group of methods aims at cost reduction while another group aims at productivity increase etc [1]. (Fig. 1).

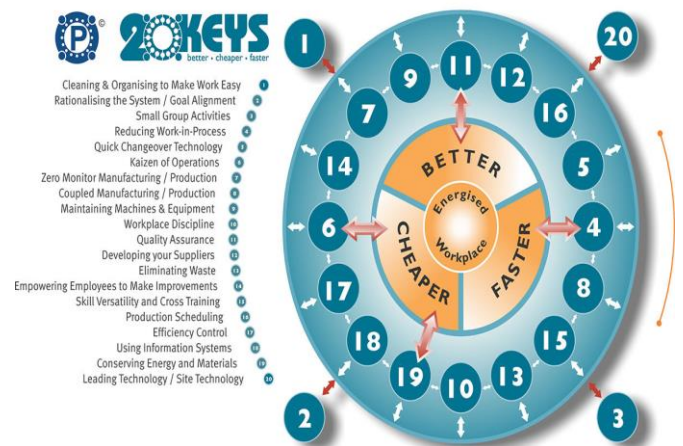


Fig. 1. 20 keys

Any chief executive aims to achieve optimal efficiency while reducing costs, he/she seeks to solve conflicts and tries to find out a method which can solve several problems. But the methods may be mutually contradicting and competitive. We can draw an analogy between the methods and competing companies so that we could use the advantages of each method while eliminating their disadvantages. We can imagine that the methods are competing for the possibility for performing some analytic work at your enterprise, as real consultants do [6]. A method takes time required to learn and to test it, to interpret its results, to promote its use in different departments, to upgrade it, to provide information reliability etc. As a result, method application requires many efforts, and their outcomes are very important. Considering that, we need to think about method efficiency. Are you content with the results of method application? If not, we have to analyse problems and conflicts which can appear as a results of using these methods [7].

III. WE SUGGEST A BRIEF DESCRIPTION OF SEVERAL METHODS AND THE CONFLICTS THEY CAN LEAD TO.

To describe the examples of conflicts, we will analyse simple methods. Let us consider Pareto chart as an example. It is used to find out which problems are most frequent so that we determine task priorities to obtain a maximal result when using correcting measures [2].

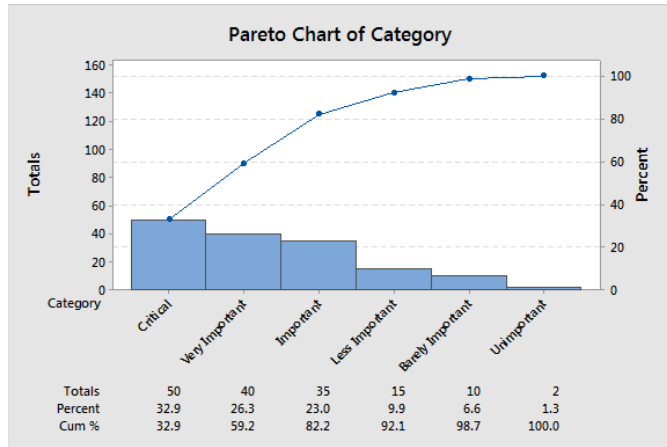


Fig. 2. Pareto chart

The method of plotting the chart is quite simple. You have to gather statistical data about problem frequency; the most frequent problem is on the first place, and less frequent problems are on the last places. But is it correct?

Another common quality management method is Ishikawa chart (Fig. 3). This chart is based on expert data. A group of experts who analyse a problem describe its causes. But mere listing of causes is usually not sufficient, one need to understand which cause has to be eliminated as first, so an expert group has to determine priorities of causes. The problem is that experts' opinions and the results of Pareto chart do not always correspond.

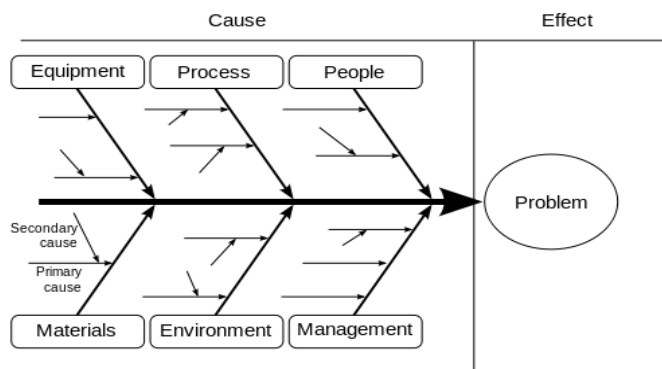


Fig. 3. Ishikawa chart

Sometimes, experts' opinion does not correspond with the statistic of problem causes. Why does it occur? The problem may be that a Pareto chart considers only problem frequency while ignoring the importance of a problem cause. Ishikawa chart, in its turn, focuses on most complex causes elimination of which is difficult and

requires joint efforts of several departments [8]. However, Ishikawa chart requires statistical evaluation to be more independent from expert's opinion. As a result, the two methods suggest eliminating different causes of the same problem, and a manager should choose among alternative options. It is usually impossible to eliminate all the problem causes simultaneously because a manager has limited time and resources. Moreover, we expect the maximal effect of managerial decisions; therefore, we use quality management methods to simplify the decision-making process [10, 11]. Instead, they often make it more complex.

The example described above demonstrates the conflict between an experts' opinion and a statistic, but statistical methods themselves can be mutually conflicting. Let us consider capability indices as an example.

Capability indices C_p , C_{pk} etc. helps to determine the level of defect safety of a production process. The higher the difference between an capability index value and 1 is, the higher the level of defect safety. In Japan, for example, the rule is adopted that an index value cannot be less than 2 so that there is a 200% guarantee of defect-free products. Thus, it is necessary to analyse the indices and to track their dynamic [3, 4].

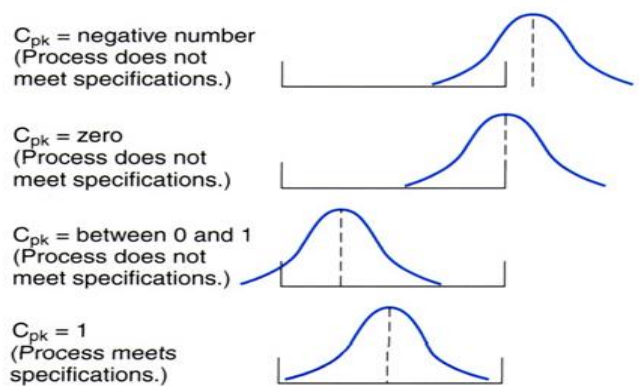


Fig. 4. Process capability index

On the other hand, there are Shewhart control charts which allow to control production process in order to exclude the causes leading to defect occurrence. It is necessary to assess quality parameters of a product and to track their dynamic in order to evaluate process stability.

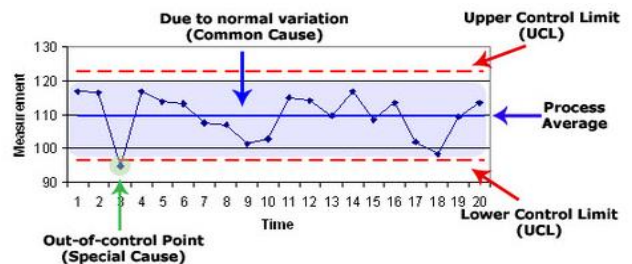


Fig. 5. Control charts

But the conflict may occur in the case when a process demonstrates negative capability indices but a positive Shewhart control chart. In

other words, process stability (assessed by a Shewhart control chart) can be satisfactory while defect probability is high. It can be compared to the situation when one constantly shoots off the target, what implies some level of stability [5]. In this case it is necessary to move the target or to adjust the weapon. We can conclude that only simultaneous use of both methods allows to assess the quality of a product as well as the quality of production processes. Sometimes the instruments indicate the same process while contradicting each other. For example, a Shewhart control chart indicates process instability and requires correcting measures although capability indices are positive; or capability indices require process improvements although Shewhart control charts indicate that a process is stable and does not need improvement.

The use of quality management can be compared with hiring a new manager who needs a workplace and time, participates in meetings and insists on his/her solutions, but may not know the current situation or is limited by his/her competences [9, 12].

IV. APPROACHES TO SOLVING CONFLICTS

To resolve conflicts between quality management methods we suggest the following approaches.

- Integration of methods

We suggest to plot a Pareto chart so that important problem causes took a special place or to combine an Ishikawa chart with the data about problem cause frequency. It is important to realise that most frequent causes not always result in the problems important for customers. For example, in the context of air transportation much attention is paid to flight safety though the emergency probability is very low. On the other hand, more frequent complaints about insufficient comfort level should not be ignored.

- Refusal of control procedures

Sometimes it is reasonable to entrust a task performer with method application rather than to control each result of method application. A method is an instrument for a task performer, so it is better to create a situation when a performer is interested in a good instrument. In other words, a method provides a possibility to improve a product; therefore, a task performer should be interested in it. That allows him/her to adjust aspecific method to real conditions.

- Personnel training.

In the process of personnel training it is important to emphasize that quality management method are not universally applicable and can induce conflicts. When training future specialists you may want to simulate a role play where participants are trained to resolve conflicts of different method application, to interpret the results and to explain their decisions.

V. CONCLUSION

Quality management method use should be trained along with analysis of possible conflicts, method limitations and peculiarities etc. Personnel cannot be considered as completely trained if they have not had experience of modelling real life situations where quality management methods are used.

Introduction of a new method usually requires additional efforts. You should study a method thoroughly before implementing it and

compare the real results of method application with the expected results. You should be aware that the method will detect problems rather than solve them. You should remember that the way of interpreting the results of method application is as important as the efforts of its implementation. It should be remembered that methods help to form work groups which will be interested in continuous improvement of production processes.

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