

CONTINUOUS IMPROVEMENT OF QUALITY

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Abstract: The paper presents some aspects regarding continuous improvement of quality, such as: Kaizen strategy, Deming Cycle PDCA, the „5 S” Method and Quality Circles, methods which can be applied in order to drive a manufacturing process towards excellence.

Keywords: quality, tools, management, Kaizen, excellence.

1. INTRODUCTION

The Total Quality Management (TQM) is a specific methodology within the logical framework of the Quality Systems. The evolution of the principles proposed by TQM is basically connected to the contributions of the pioneers of the Quality Systems like W.E. Deming, J.M. Juran, A.V. Feigenbaum and K. Ishikawa.

TQM is focused on:

- a) Customer satisfaction: quality is meeting then exceeding customer requirements and expectations (for products, services or information and communication delivery), both stated and implied.
- b) Continuous improvement: the use of benchmarking should be a basic rule of the organization. Benchmarking is a process for rigorously measuring performances versus the best-in-class companies and for using the analysis to meet and surpass the best-in-class.
- c) Total organization involvement: in TQM it is strictly required to involve in the process everyone inside the organization. Each enterprise involved in a total quality process realizes a permanent effort to ameliorate its activity, in every sector, continuously and implicating every employee at every hierarchical level.

Those principles gave birth to a model adopted in the economy (at first by the manufacturers, in Japan in the fifties, in USA in the seventies, in Europe in the eighties, later by other economic and social sectors, both private and public), together with the Quality Certification Systems introduced by ISO and spread all over the world through national organizations, responsible for the normation and accreditation in quality (e.g. ISO 9000 norms).

TQM is more advanced than quality certification: it encompasses all organizations activities and human resources. TQM is promoted by means of “awards” like: Deming Quality Prize in Japan (1951), Malcom Baldrige Award in USA (1987), European Quality Award in the EU (1992), other minor quality awards elsewhere.

2. KAIZEN STRATEGY

The guidelines for services quality are basically in these two Japanese words, used by Maasaki Imai, one of the fathers of quality systems: Kaizen and Kairyo. The Kaizen approach and the Kairyo approach are compared according to their differences in the components of the activity concerned: the application to the services is evident, and we can choose the fitting approach in accordance with customers’ expectations [1].

Kaizen means continuous improvement. Kaizen is an efficient strategy to think and solve problems step by step with the contribution of all. It distinguishes itself from innovation which proposes breakthroughs that need important investments. Figure 1 and Table 1 show the essential differences between the two methodologies: Kaizen and Kairyo.

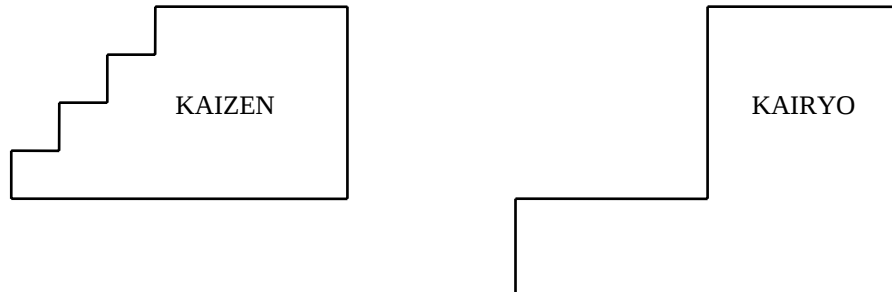


Fig. 1. Difference between Kaizen and Kairyo

Table 1. Differences between Kaizen and Kairyo

ACTIVITY	KAIZEN improvement	KAIRYO reengineering
Level of the change	Gradual and continual	Radical, sudden and not steady
Starting point	Existing processes	Zero point
Frequency of the change	Continuous	Once
Speed	By little degrees	By great strides
Timing	Continuous and in progress	Intermittent
Involvement	All	Few and selected
Participation	Bottom up	Top down
Style	Consent	Directive
Risk	Moderate	High
Rules	Adaptation and evolution	Conflicts and discussions
Forms of action	Maintaining and improvement	Dismantling and building
Approach	Collective, team working	Individuals' efforts
Evaluation criteria	Process and striving for the best practices	Results and profits

Maasaki Imai says that in most cases the quality improvement can be reached through the Kaizen methodology, but some times it is necessary and compulsory to adopt the Kairyo methodology. Reengineering normally refers to a drastic, dramatic process improvement in certain areas of management or in certain phases of the product or service life cycle. However, reengineering addresses only a limited area of problems in the company and brings about limited improvement, no matter how dramatic. Reengineering probably will always have its place as an organizational change process. But it is relevant in limited circumstances because, ultimately, it produces short-term and static results. Reengineering is like innovation. We expect innovation to occur all the time, yet we know it doesn't happen. It's unrealistic to expect reengineering to be applicable all the time. That would cause chaos. Kaizen is a more lasting improvement process.

3. DEMING CYCLE (PDCA)

Deming cycle is a method for continuous improvement and consists of following the PDCA philosophy, which is represented by four steps (Fig. 2):

- Plan: establish what must be done;

- Do: realizing what has been forecast;
- Check: checking and demonstrating what has been realized;
- Act: rectifying according to the results.

After each cycle, it's very important to steady realized improvement, to come back to the starting point and to restart another cycle, and so on.

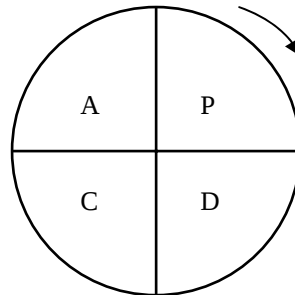


Fig. 2. Deming Cycle (PDCA)

For the Plan part, which can be separated in several steps, it is recommended to use different specific tools. For the *step identify the problem*, we will use the Brainstorming; for *choose priorities*, the Pareto law; for *collect data*, report sheet or histogram; for *looking for the causes* of non-quality, the Cause- Effect Diagram (Ishikawa), FMEA (Failure Mode and Effect Analysis).

For the Do part we must first use the set of WWWHHWF questions (What? Who? Where? When? How? Why? For whom?) and determine and choose the means. That can be done with the help of Poke-Yoke tool (simple and cheap anti-errors system. It allows to avoid errors as a preventive and can be implemented from the conception phase or as soon as a human mistake is discovered). Next, for the confirm solutions we will use the QFD tool (Quality Function Deployment, also known as “House of Quality”).

For the Check part we will use Statistical Process Control (SPC) in the *Control* step. For the *interpreting and evaluating* step we will use tools such as report sheets, histogram, SPC.

For the Act part we have to use FMEA tool.

4. THE “5S”

The 5S method is it considered as an essential, very simple and efficient management technique and *the first practice of total quality*. This method is born and has been applied first in Japan, and has spread throughout Europe and America.

Good managers know that in order to drive an enterprise to excellence we must begin with the 5S and applied it continually.

The name 5S comes from the first letters of the Japanese words: *seiri*, *seiton*, *seiso*, *seiketsu*, *shitsuke*, which can be respectively translated by: *clearing*, *tidying*, *cleaning*, *order* and *rigour*. Their significations are detailed below:

Seiri: Clearing what is useless means strictly keeping what is essential and clearing the rest. It's a fight against human propensity to collect everything.

Seiton: tidying things according to their usefulness. It supposes to place and order things in order to keep them easy of access and avoid useless movements and loss of time.

Seiso: Cleaning ensures the neatness of the working place and allows malfunctions and defaults detection.

Seiketsu: Order is not an activity according to the strictest definition of the term but it consists of maintaining a pleasant and long-lasting sight at the working place by the regular use of the first three steps.

Shitsuke: Rigour consists in encouraging and motivating the employees in keeping their good habits in order to continuously improve the rules to reinforce the efficiency and adapt themselves to new situations.

There's no place for drifting, hierarchy must continue to explain the process and particularly what has been bad understood in order to work in a more welcoming, cleaner, safer and more pleasant quality environment.

The 5S method gives spectacular and undeniable results, contributing to productivity, safety and life quality improvement. Because this method physically transforms the working place, people work in better conditions. So it deeply modifies people frame of mind at every hierarchical levels, contributing to the growth of the personnel efficiency and wellness.

5. QUALITY CIRCLES

A quality circle is a volunteer group composed of workers who meet together to discuss workplace improvement, and make presentations to management with their ideas. Typical topics are improving safety, improving product design, and improvement in manufacturing process. Quality circles have the advantage of continuity, the circle remains intact from project to project.

Quality Circles were started in Japan in 1962 (Kaoru Ishikawa [2] has been credited for creating Quality Circles) as another method of improving quality. The movement in Japan was coordinated by the Japanese Union of Scientists and Engineers (JUSE). Prof. Ishikawa, who believed in tapping the creative potential of workers, innovated the Quality Circle movement to give Japanese industry that extra creative edge. Quality circles are established with management approval and can be important in implementing new procedures. While results can be mixed, on the whole, management has accepted quality circles as an important organizational methodology.

The operation of quality circles involves a set of sequential steps as under [3]:

1. Problem identification: Identify a number of problems;
2. Problem selection : Decide the priority and select the problem to be taken up first;
3. Problem Analysis : Problem is clarified and analyzed by basic problem solving methods;
4. Generate alternative solutions: Identify and evaluate causes and generate number of possible alternative solutions;
5. Select the most appropriate solution: Discuss and evaluate the alternative solutions by comparison in terms of investment and return from the investment. This enables to select the most appropriate solution;
6. Prepare plan of action: Prepare plan of action for converting the solution into reality which includes the considerations "who, what, when, where, why and how" of solving problems;
7. Present solution to management circle members present solution to management fore approval;
8. Implementation of solution: The management evaluates the recommended solution. Then it is tested and if successful, implemented on a full scale.

CONCLUSION

It is sensible to know, use and control the good quality methods/tools in order to reach an effective total quality management and, using continuous improvement, to stay in the road towards excellence.

That must be known and applied by everyone (employees or managers) at their levels in each enterprise which wants to be a success.

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