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PRECURSORS OF QUALITY MANAGEMENT

PhD. Assoc. Prof. Daniela Ghelase
PhD. Assoc. Prof. Luiza Daschievici
"Dunarea de Jos" University of Galati, Romania

ABSTRACT

After World War II, two major forces emerged that had a profound impact on quality. The first was the Japanese quality revolution and the second was the awareness of the importance of product quality in the mind of the customer. The promoters of that quality revolution in Japan were the Americans. The paper presents the contributions of the most important precursors of quality management.

KEYWORDS: Quality management, TQM, W. Eduards Deming, Joseph M. Juran, "Zero Defects", "Quality Trilogy", CWQC.

1. INTRODUCTION

The 20th century saw extremely rapid changes in the production of goods and services.

After World War II, two major forces emerged that had a profound impact on quality:

- The Japanese quality revolution;
- The awareness of the importance of product quality in the minds of the customers.

In the first case, during that period, Japanese products were considered to be of poor quality, which forced the Japanese to take radical measures to ensure the competitiveness of their products in the international market. The main measures were:

1. In this quality revolution, top-level managers at the highest level assumed the task and responsibility for its leadership;
2. At all levels and for all functions, quality discipline was introduced;
3. Numerous projects have been initiated to improve quality through a continuous and fast-paced process.

It should not be forgotten that the promoters of this quality revolution in Japan were the Americans, who, due to the poor organization and functioning of the Japanese telecommunications industry and services, decided to apply American management and quality control methods to this sector, trying to solve the problems faced by the American occupation army.

In 1946, W.G. Magil and H.M. Sarahson of the Civil Communication Section of SCAP initiated this action, training Japanese specialists and managers in the field of telecommunications production and services. With this, they initiated what would become, in the 1970s, the so-called "Japanese phenomenon".

The most important precursors of quality management are considered to be W. Edwards Deming, Josep M. Juran, Armand V. Feigenbaum, Kaoru Ishikawa and Philip B. Crosby.

2. DEMING'S QUALITY IMPROVEMENT PROGRAM

A disciple of the statistician W. A. Shewhart, Deming was concerned with the statistical interpretation of the phenomenon of quality. One of his reference works is "On the Statistical Theory of Errors", published in 1934, which was the basis of the courses that Deming held in Japan.

In 1950, Deming, at the invitation of the Japanese Union of Scientists and Engineers (JUSE), gave lectures and seminars to an audience of quality control specialists and high-ranking officials who understood the importance of quality control. The topics of these lectures strongly promoted the introduction of quality control techniques into

Japanese industry.

In recognition of his prestigious activity in the field of professional development of workers in Japanese industry, the Deming Prize was established (1951).

The "14-Point Program" for improving quality and productivity is currently enjoying great success. This program targets the management of the enterprise, which Deming considered responsible for providing the necessary framework for this improvement, by respecting the 14 points:

1	Ensure continuous improvement of the quality of products and services, based on a plan, in order to become competitive and stay in business.
2	Adopt a new philosophy, giving up the "acceptable level" of quality. You can no longer survive with "acceptable levels", non-conformities, defects, delivery delays.
3	Abandon full product control, introducing statistical control methods to establish compliance with specified requirements. It is preferable to prevent defects rather than identify them.
4	Request evidence from the supplier regarding the statistical record of quality. Business is now based more on quality than price. Eliminate suppliers who do not provide evidence of such a record.
5	Discover the problems. Management must be committed to continuous improvement of all processes at every stage of product manufacturing, from design to in-use service;
6	Use modern training methods for all company personnel;
7	Provide all employees with the necessary tools to perform their jobs properly. Team leaders' responsibility should be focused on quality and management should be prepared to act immediately on their reports of deficiencies.
8	Eliminate fear, encourage communication so that every employee can present their point of view openly;
9	Remove barriers between company departments. Form teams, including people from different departments (research, design, production, sales) to identify problems and prevent them in subsequent processes.
10	Eliminate posters and slogans specific to forced labor. Before pursuing productivity growth, make sure that it is not to the detriment of quality, which you must continuously improve.
11	Review normal working hours so that they do not become an obstacle to productivity or quality.
12	Remove all obstacles that prevent people from taking pride in their work.
13	Introduce a rigorous staff training program, in relation to the evolution of procedures, methods and techniques used in all departments of the company;
14	Create an appropriate structure at the top management level to ensure the fulfillment of the 13 points

3. JURAN-"QUALITY TRILOGY"

A university professor in New York, Joseph M. Juran was born in Brăila in 1904 and settled in the USA in 1912. In 1991 he became an honorary member of the Romanian Academy. He died in 2008.

In the early 1950s, he initiated and coordinated training courses for workers in Japanese industry under the motto "quality is everyone's problem".

His book "Quality Control Handbook", published in 1951, became a reference work in organizing quality control in enterprises, not only in Japan, but also in a number of Western European countries. As in the case of Deming, Juran's merits were recognized in the USA starting in the 1980s.

Juran advocated continuous quality improvement, distinguishing between "sporadic problems" and "chronic" ones. While the former can be solved by workers, chronic ones, which account for 80% of quality problems, must be solved by managers in order to improve quality.

His work "Managerial Breakthrough" was intended to be a guide for solving chronic quality problems. To ensure continuous quality improvement, Juran proposed the following sequence of steps:

• convince others of the need for improvement;

• identify "vital projects", using the Pareto chart;

• ensure progress in understanding the problems;

• conduct analysis to discover the causes of the problems;

• determine the effect of the proposed changes on the staff involved and discover the possibility of overcoming resistance to these

changes;

• act to achieve the expected changes, including ensuring the training of the staff involved;

• introduce an appropriate system for monitoring the new level of quality, which does not slow down the process of continuous improvement.

In Juran's view, quality means "fitness for use". He was among the first to argue that quality should not be approached as a homogeneous entity, the same product having to satisfy different customer requirements.

In order to make products "fit for use", their requirements, defined on the basis of market research, must be translated into technical terms, in the form of specifications. But in Juran's opinion, "conformity with specifications" says nothing about the degree to which customer requirements are satisfied.

In order to ensure "fitness for use", a multitude of interrelated activities must be taken into account, which Juran represented in the form of a "quality spiral".

This spiral represents the entire trajectory of the product, from market research to identify needs, through design, production, sales, after-sales services, and back to research.

It is obvious that not only the quality department, but all departments contribute to achieving the desired "fitness for use".

Like Feigenbaum, Juran believes that the essential role in quality assurance should be played by the top management of the organization, which is responsible for initiating and implementing processes for quality improvement. At the same time, quality improvement must be supported by the cooperation of all departments and by initiating a training program at all levels of management.

Juran defines quality management in terms of the "quality trilogy" (Fig.1).

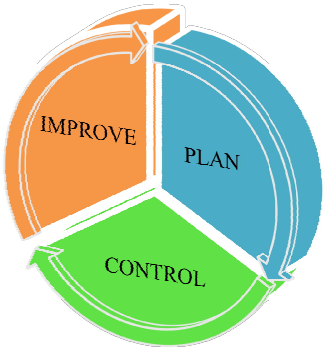

Fig. 1 Quality trilogy

In his opinion, quality management would include three categories of processes: planning, controlling and improving quality.

4. TQM-DEFINED BY FEIGENBAUM

Armand V. Feigenbaum was the first to define the concept of "Total Quality Control" in 1956.

"Total Quality Control represents an effective system for integrating the efforts of all departments of the enterprise (marketing, engineering, production and service) regarding the achievement, maintenance and improvement of quality for the purpose of total customer satisfaction, under conditions of efficiency" - definition given by Feigenbaum in the work Total Quality Control.

Like Deming and Juran, Feigenbaum believes that a product or service can be considered of superior quality if it meets consumer expectations. He attaches great importance to the correlation between quality and price, demonstrating a "cost orientation" in defining product quality.

Feigenbaum defines his concept of TQM through the following elements:

Feigenbaum emphasizes three aspects, considered particularly important in the approach to quality:

a) consumer requirements determine quality;

b) everyone is responsible for quality, from

the top management of the company to the last worker;

c) all departments of the company, so not only production, participate in achieving quality.

Feigenbaum was among the first specialists in the field of quality to highlight the fact that each of the stages of the "industrial cycle" intervenes in the achievement and assurance of quality. The stages of the "industrial cycle" are: marketing, design, procurement, production, production control, inspections and tests, transport, installation at the buyer and service.

Another contribution of Feigenbaum is the clarifications he brings in the field of costs related to quality.

5. CWQC AND ISHIKAVA

The main authority in the field of quality in Japan is Kaoru Ishikawa. He developed the theories of American experts Deming, Juran and Feigenbaum, being a follower of the involvement of each employee in the company in achieving quality, emphasizing participative management.

Kaoru Ishikawa also has a series of personal contributions in the field of quality management. He is at the origin of the "quality control circles", later called "quality circles", which have become widespread in Japan. He also conceived and developed the "cause-effect diagram" (Ishikawa diagram), a well-known quality tool.

Although he agrees with the TQM concept, developed by Feigenbaum, Kaoru Ishikawa advocates for a broader approach to quality, outside the strictly professional field, so he called his own concept "Company Wide Quality" (CWQC). Later, after clarifying some aspects, the two concepts have more or less the same meaning: total involvement of the company and continuous quality improvement. CWQC has three basic components: a) quality assurance; b) quality control; c) cost, quantity and delivery time control

Ishikawa attributes the quality of customer to the people involved in the process of creating products in the company's departments (design, production, marketing, sales), calling them "internal customers". He calls the final beneficiaries of the product "external customers", this principle becoming one of the basic principles of total quality management.

Another contribution of Ishikawa is the creation of a classification of statistical methods, depending on the difficulty of their application:

a) Elementary statistical methods (Pareto diagram, cause-effect diagram, histograms, etc).

b) Intermediate statistical methods (statistical surveillance theory, statistical control by sampling, etc);

c) Advanced statistical methods (advanced design, multi-criteria analysis, etc).

Ishikawa believes that intermediate and advanced statistical methods are for specialists, and the elementary ones should be mastered by all company personnel.

CROSBY: "ZERO DEFECTS"

Philip B. Crosby, vice president and director of quality for the International Telegraph and Telephone Trust in the U.S., is the originator of the "zero defects" concept.

The essence of the "zero defects" concept is that "everything must be done right the first time and every time". In Crosby's view, defects have two main causes:

- insufficient level of knowledge;
- inattention.

While the first cause can be easily eliminated, inattention is an attitude problem that must be solved by each individual.

Crosby is the author of a motto: "quality should not be controlled, it should be achieved". Quality cannot be ensured only by a rigorous control system, capable of discovering all anomalies. To achieve appropriate quality, it is necessary to emphasize prevention.

In his opinion, quality does not cost ("quality is free"). What does cost is non-quality. Therefore, he proposes that the quality assessment at the enterprise level be carried out through the "price of non-conformity with requirements".

6. CONCLUSIONS

All these precursors of quality, presented in the paper, considered that in order to satisfy the consumer, his demands must be clearly defined and measurable, this responsibility falling on the company's management. They believed that if the requirements specified in a standard are respected and the necessary conditions are provided for workers to achieve them (by stimulating them materially and morally), then good quality products can be obtained.

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