

(Research/ Review) Article

Deming's Quality Assurance System Model and Its Application in Education

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Abstract: The purpose of the study was to determine the Deming quality assurance system model and its application in education. This study uses a library research type. Literature research as a research conducted by reviewing various journals and related reference books. The results of the study indicate that the quality assurance system model according to Deming emphasizes the importance of customer satisfaction and continuous improvement through 14 famous points. Deming also stated that the majority of production failures are caused by managers, so improving the quality of managers is the key to improving overall quality. The PDCA (*Plan, Do, Check, Action*) management function developed by Deming is the basis for managing continuous quality improvement and is the basis for the development of Total Quality Management (TQM).

Keywords: Quality Assurance System, Deming, and Education.

1. Introduction

Every human being expects the best or high quality. Therefore, quality is everyone's business. Quality was first applied in the business world and was successful. Lessons learned from the business world can be seen in improving quality such as: IBM, which states that quality is customer satisfaction. Ford Motor Co., states, "quality is satisfying customers to the fullest. Listen and respond to your customers and take all constructive suggestions seriously."

Quality is something that meets or exceeds standards. Education is said to be of high quality if it has reached or exceeded educational standards. Quality can be absolute and relative. Absolute quality is quality that can no longer be improved. For example, the learning outcome value has reached 100 or A. Relative quality is quality that can still be improved. For example, learning outcomes are still below grade or not yet.

Quality assurance of goods (products) and services is an aspect that is always a benchmark in the industrial world in particular where the level of success of a company can be measured from the products it produces (quality). This measure is very important in ensuring customer or consumer satisfaction to always be consistent in using products or services from a company or institution.

Deming in Nasution, explains that quality is conformity to market or consumer needs. Companies must truly be able to understand what consumers need for a product to be produced. Or in other words, market or consumer needs are the main goal in producing goods or services.[5]

The goods or services produced will not be of good quality or standard if their management (in relation to companies or institutions) does not refer to the quality standards that have been set so that, in terms of the suitability of the products or services produced, they are always relevant to the needs of customers as users of goods and services.

Nasution emphasized the importance of quality that can be seen from two sides, namely operational management and marketing management. The quality of operational management can be seen from the quality of the product. The resulting product must provide satisfaction to consumers that exceeds or at least equals the quality of the competitor's product, because this is a benchmark for policy making in increasing competitiveness. The quality of marketing management can be seen in the marketing mix, namely product, price, promotion, and distribution channels that can increase sales volume and expand market share. [5]

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For this reason, a company or institution should use and utilize established quality standards—one of which in this case is Total Quality Management, which is an approach, the implementation of which is a philosophy and a set of guiding principles that form the basis for continuous improvement of an organization.[2]

Total Quality management in its development developing various models and methods related to the quality of goods or services. Many quality figures who are pioneers who are the bearers of the importance of quality or quality of goods or services from a company, such as W. Edwards Deming, Joseph Juran and Philip B. Crosby.

W. Edwards Deming as one of the pioneers who initiated the importance of quality said that, quality problems actually come from poor management problems of an industry.[2] In this case, Deming saw that, poor management will result in the production of goods and services in an industry will experience failure especially with the quality of goods and services produced, thus customer and consumer satisfaction becomes a serious problem. In addition, the industry will not be able to develop market share further.

Edward Deming quoted by Tjiptono outlined fourteen points that became references in developing product and service quality as well as to develop companies to be more competitive in the industrial world. Deming's thoughts related to total quality management, especially in improving the quality of production of goods and services in Japan, led to his name as the father of quality management. Deming noted his success in leading the quality revolution in Japan, namely by introducing the use of problem solving techniques and statistical process control. For his great services to Japanese industry, an award called the Deming Prize is given every year to every company that excels in quality.[3]

With this achievement, in total quality management, various integrated quality management models emerged and developed one of which is the Quality Management Model: The Deming Prize. This model is the estuary of Deming's thoughts and contributions in terms of quality assurance. The Deming Prize is an award used as a standard of quality for major industries in Japan in every aspect of the company, from product goods and services to management, administration and marketing

2. Preliminaries or Related Work or Literature Review

Short Biography of W. Edwards Deming

W. Edwards Deming was an American statistician who had a PhD in physics. He was born in 1893. His influence as a management theorist began in the West, but it was Japan that took advantage of his expertise in the 1950s. Deming began formulating his ideas in the 1930s while conducting research on methods to eliminate variability and waste from industrial processes. He began his work at Western Electric, owned by the legendary Hawthorne company, in Chicago.[2]

Deming, as an American doctor of statistics who is a renowned quality expert and who taught Japan about the concept of quality control, stated that the industrial process must be viewed as a continuous quality improvement, which starts from a series of cycles since the idea to produce a product, the product process, to distribution to customers; then based on information as feedback collected from product users (customers) ideas are developed to create new products or improve the quality of old products along with existing production.[10]

In its early development, Deming's idea of total quality received little attention in America and the West, where the emphasis of American and Western industry was on maximizing production and profits.[2] But this is different from Japan, which uses Deming's ideas to improve the quality of goods and services, so that it is able to control the world market. The embodiment of the concept offered by Deming, which was then truly developed in Japan. Since the late 1970s, Japan has begun to successfully attract customers. And this has made industrialization in America and the Western world begin to question what strategy is being implemented in Japan. Finally they realized that implementing the highest quality in products is more important than just maximizing production and profits by ignoring quality.[6]

Attention to product quality in its development has given rise to several awards given to companies that have successfully implemented Total Quality Management (TQM). Where TQM can be said as one form of the realization of Deming's idea above. One of the awards is the Deming Award, which was established in 1951 to commemorate Deming's services to Japanese quality control.[5]

3. Proposed Method

This research uses a library research type. Literature research is a research conducted by reviewing various journals and related reference books, which can ultimately be analyzed and concluded from various sources obtained by the researcher.[1] The research approach is qualitative research which is carried out with an orientation towards natural phenomena that occur and this research is not carried out in a laboratory. The research conducted is descriptive in nature where researchers collect words not in the form of a series of numbers for this study which in essence the words can provide a picture or present existing problems and problem solving. The data analysis used is by analyzing the content, where the analysis emphasizes more on describing the contents of various existing propositions that are born from various theories and previous analyses conducted by other researchers.

4. Results and Discussion

W. Edward Deming's Contribution in Developing the Concept of *Total Quality Management*

W. Edwards Deming as a quality management expert has given rise to many ideas and concepts related to the quality of goods and services that are very valuable as developed by Japan so that it is able to become a world market controller until now. Deming's contributions to quality management are:

Deming Cycle

The Deming cycle was developed with the aim of combining the production of a product with customer needs and focusing on available resources. The stages in the Deming cycle are known as the PDCA cycle or if described, namely plan, do, check, and act.

1. Plan

This stage is carried out planning by identifying problems, setting goals. And planning corrective actions to be taken.

2. Do

This stage is carried out after the planning stage, namely implementing the plan that has been prepared. This involves implementing changes or improvements that have been planned at the planning stage.

3. Check

This stage is the evaluation stage of the results of the actions that have been taken. This can be in the form of data collection, analysis of results, and comparing with the objectives that have been set at the beginning.

4. Act

This stage is the follow-up stage. If the improvements made are successful, the changes can be standardized or applied permanently. However, if the improvements have not achieved the desired results, then corrective actions need to be designed, and the cycle can be repeated.[1]

These four activities are carried out repeatedly in the organization by conducting analysis on how the market accepts the product in terms of quality, cost, and other criteria.

Deming Fourteen Principles of Management

These fourteen deming points are a summary of W. Edwards Deming's overall views on what a company must do to make a positive transition from business as usual to world-class quality business. The following is a summary of the fourteen Deming points, namely:

1. Create consistency of purpose in moving towards product and service improvement, with the intent of becoming more competitive, staying in business, and creating jobs.
2. Adopt a new philosophy. Management must understand the new economic era and be ready to face challenges, learn to be responsible, and take over leadership to face change.
3. Stop relying on inspection to build product quality. Build quality in from the start.
4. Stop the practice of awarding contracts based on low bids
5. Constantly and continuously improve production and service systems, to increase quality and productivity, which in turn constantly reduces costs.
6. Institute *on the job training*.
7. Institutionalize leadership. The goal of leadership should be to help people and technology work better.

8. Eliminate fear so everyone can work effectively.
9. Remove the walls between departments so people can work as a team.
10. Eliminate slogans, demands, and targets for the workforce. These can create hostility.
11. Eliminate quotas and management by objectives. Replace them with leadership.
12. Remove barriers that can rob employees of their pride in their skills.
13. Promote education and self-improvement programs.
14. Make the transformation everyone's job and prepare everyone to do it.[2]

These fourteen points are the basic foundations used by every company in running its company and in producing quality goods and services as offered by Deming. This is one of the ideas offered so that companies can progress and develop like Japan, for example.

Deming Seven Obstacles to Quality Improvement

Here are seven obstacles to quality improvement that companies with a vision to improve product quality must avoid, namely:[8]

1. There is no fixed goal for planning products and services that have a sufficient market to keep the company running and jobs available. Many companies are run simply to make a profit so that it can be distributed immediately to shareholders.
2. Emphasis on short-term profits, short-term thinking influenced by fear of takeover attempts does not produce dividends. If top management only thinks about profits, especially by cutting education and training costs, cutting maintenance costs, and cutting research costs, productivity and quality will never increase.
3. A system of personal appraisal for managers and management based on objectives without providing sufficient methods or resources to achieve those objectives.
4. Overwork from managers
5. Using only visible data and information for decision making and ignoring the unknown and unknowable.
6. Excessive or very high health care costs (health benefits).
7. Costs for compensation caused by lawyers.

Quality Management Model: The Deming Prize

Quality is one of the elements that determines whether a product or service has a selling value among consumers. Often consumers before buying or using a service if they do not know the quality - so it can be said that quality has a very significant role. But more than that, quality products have other important aspects, namely: 1) consumers who buy products based on quality, generally have greater product loyalty compared to consumers who buy based on price orientation; 2) is contradictory to the traditional business mindset, because in reality producing quality goods is not automatically more expensive than producing low-quality goods; and 3) selling low-quality goods is likely to receive many complaints and returns from consumers, or the cost to repair them becomes very large, in addition to also getting a bad image.[7]

In relation to that, there are quality standards that are used as benchmarks in determining the quality of a product or service—one of which is the Deming Prize quality management model. In Japan, several leading companies have an obsession with winning the Deming Prize. With the idea that the company that wins this award means that the company has really good quality. The Japanese national quality award was launched in 1951.[2] This launch is to commemorate W. E. Deming's contribution to Japanese quality control, funded by the copyright of Dr. Deming's transcripts of his lectures for JUSE (*Union of Japanese Scientists and Engineers*).[5]

The Deming Prize is divided into two categories, namely for individuals who have contributed to quality control and statistical methods. Japan, and awarded to industry. This second prize has additional categories in several areas, including: the Deming Application Prize for divisions, the Deming Application Prize for small companies, and the Quality Control Award for factories awarded by the Deming Prize Committee.

Winning the Deming Prize, as an attempt to master total quality control, has become an obsession for several leading companies in Japan. There are several award categories, including division, factory, large, medium and small companies. In addition, there is also the Deming Prize which is awarded to individuals who have made significant contributions to statistical theory.[2]

5. Conclusions

Deming emphasized the importance of customer satisfaction. He believed that customer satisfaction was created through a combination of responding to customer needs, continually improving product quality, and implementing operating and service systems. Deming

provided a way to manage quality with 14 very famous points, namely: (1) Create certainty of purpose for improving products and services; (2) Adopt a new philosophy where defects are unacceptable; (3) Stop depending on mass inspection; (4) Stop doing business on the basis of price alone; (5) Constantly and continuously improve production and service systems; (6) Institute modern job training methods; (7) Institute leadership; (8) Remove barriers between departments; (9) Eliminate fear; (10) Eliminate/reduce number goals for workers; (11) Eliminate management by objectives; (12) Eliminate barriers that demean part-time workers; (13) Institute careful education and training programs; (14) Create a structure in top management that can carry out the transformation as in the points above.

Deming stated that 80% of production failures were not caused by workers but by their managers. 20% by other factors. Therefore, if you want to improve quality, then improve the manager's skills first. The management function according to Deming is Plan, Do, Check, Action (PDCA) as Deming's first offer to manage Quality Improvement (QI) continuously. Deming together with Shewhart developed PDCA to improve quality called Satisfactory Process Control (SPC). Furthermore, Deming, Shewhart, and associated with Mayo and his friends developed SPC into TQM.

Author Contributions: Providing conceptual contributions in developing theories or concepts that form the basis of research

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