

The impact of service maintenance on the quality indicator of manufactured products

Sergey Yekimov^{1*}, *Akhmadjon Ortikov*¹, *Tatiana Egorushkina*², *Vladislav Belyaev*², *Dmitrii Boroukhin*², *Valerii Shchebeteev*³, and *Nikolay Storchak*³

¹Czech University of Life Sciences, Prague, Kamycka 129, 16500, Praha - Suchdol, Czech Republic

²Tula Branch of Plekhanov Russian University of Economics, 53, Lenina Avenue, Tula, 300000, Russia

³Kuban State Agrarian University named after I.T. Trubilin, st. Kalinina, 13, 350044, Krasnodar, Russia

Abstract. To create conditions that ensure the competitiveness and high quality of products, an industrial enterprise should have a system for managing the quality of products. This should include product quality management at all stages of the production cycle. Product quality management should be comprehensive, involving the use of organizational, economic and technical measures. A comprehensive quality management system at an enterprise should be based on the quality standards adopted at that enterprise. The evaluation of the quality of the products produced from the point of view of its buyer is subjective and depends on the usefulness of this product to a particular consumer. It is advisable for an enterprise to track consumer preferences in order to make its products better from the point of view of customers. After-sales service is an important element in the way of promoting products on the market. The organization of effective service requires the coordination of technical, marketing and commercial activities, taking into account consumer preferences.

1 Introduction

The problem of quality management in the modern world is an important parameter that determines the quality of life, the level of social, economic and environmental security.

According to [1], quality is the most important indicator that characterizes the way of life, as well as the economic and social basis for the effective development of society and the individual.

According to [2], the economic development of the state is largely determined by its scientific and technological progress. The main task of scientific and technological progress is the production of high-quality products with minimal labor and material resources.

According to [3], the main goal of scientific and technological progress is to meet the needs of consumers as much as possible. At the same time, with the growth of the economy, consumers have new opportunities that are provided by technologies that produce material goods.

* Corresponding author: yekimov@pef.czu.cz

According to [4], the intensive development of the economy should, along with an increase in the volume of products produced, provide for improving the quality of these products.

According to [5], the quality management process at an industrial enterprise involves the production, design and sale of products that best meet the needs of consumers.

According to [6], the product quality management system is a process of regulating the production processes of an enterprise, focused on achieving the product quality required by consumers.

According to [7], the quality management system of manufactured products is an important component of the overall production management system at the enterprise.

According to [8], one of the important reasons for the inefficient functioning of the quality management system in an industrial enterprise is competition between individual divisions of the enterprise and not sufficiently effective interaction between them.

The authors [9] note that sufficient motivation of the employees of this enterprise is of great importance for the effective functioning of the quality management system in an industrial enterprise.

According to [10], an inefficient quality management system at an industrial enterprise is often due to its poor adaptation to the organizational structure and production activities of this enterprise.

According to [11], there are two main strategies for managing the quality system in an industrial enterprise (Figure 1):

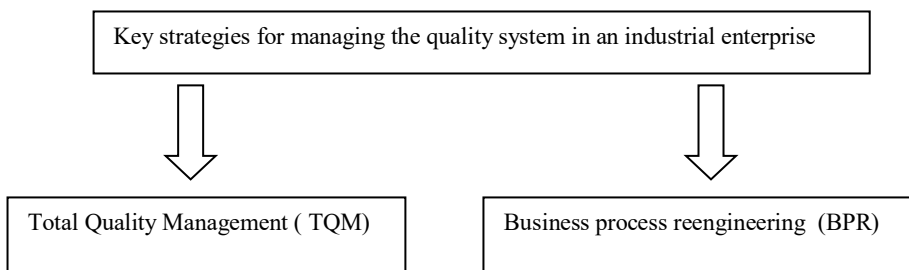


Fig. 1. Key strategies for managing the quality system in an industrial enterprise.

Business process reengineering is based on a radical change in the quality management of an industrial enterprise. According to [8,9]

business process reengineering is based on the use of a functional approach. For its implementation in the company, it is necessary to correctly take into account the production processes taking place at the enterprise. At the same time, the most important processes are those that create value for the company's customers. As a rule, business process reengineering is based on the introduction of telecommunications and digital technologies to radically update organizational and production processes.

Total Quality Management is based on a systematic evolutionary change in the quality management system at an industrial enterprise.

According to [12], Total Quality Management is a versatile and coordinated application of quality management methods and systems at all stages of the production process, while ensuring optimal use of the resources available to the enterprise.

According to [13], the use of Total Quality Management, first of all, should be aimed at increasing the efficiency and competitiveness of the enterprise.

According to [14], a great value in the level of product quality is its novelty and competitive technical characteristics.

According to [15], it is important to control the quality of products starting with the quality of the raw materials used in the production process, since the quality of the final products transmitted to consumers largely depends on this.

According to [16], the concept of Total Quality Management should include (Figure 2):

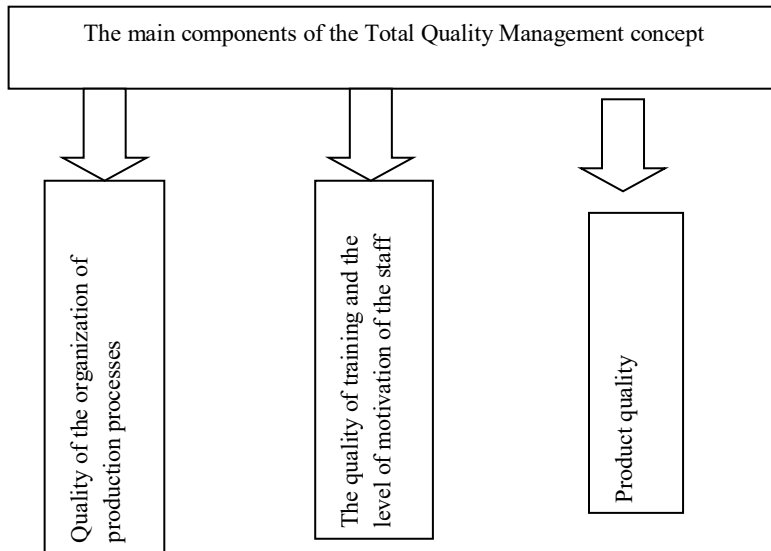


Fig. 2. The main components of the Total Quality Management concept.

According to [17], the effectiveness of Total Quality Management in an industrial enterprise can be determined based on the criteria (Figure 3):

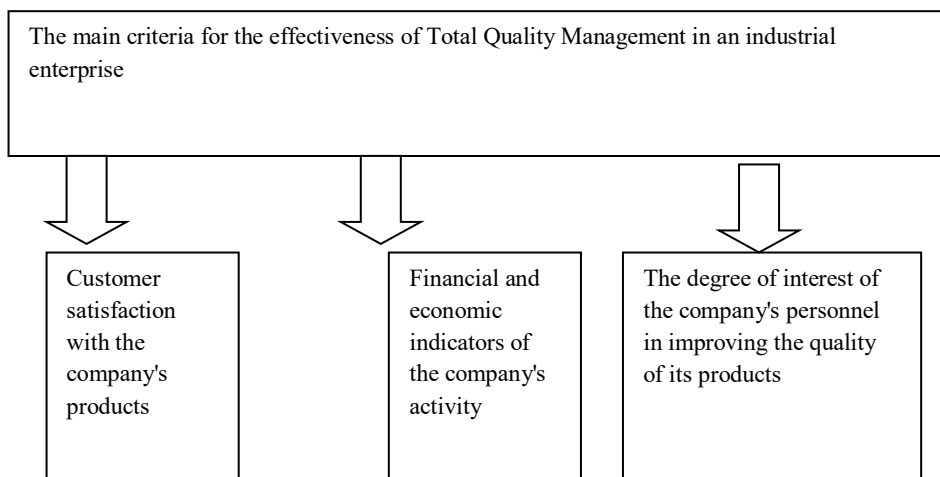


Fig. 3. The main criteria for the effectiveness of Total Quality Management in an industrial enterprise.

According to [18], for the effective use of Total Quality Management, it is advisable:

1) To involve the company's personnel more widely to ensure quality control of the products produced.

- 2) Focus on quality indicators based on the performance of industry leaders.
- 3) Use outsourcing, if it allows you to reduce the cost and improve the quality of products.
- 4) Apply a process approach to quality management

According to [19], the effectiveness of the practical application of Total Quality Management depends on the leadership qualities of the company's management and the availability of the necessary operational management information.

According to [20], in order to effectively manage the quality of manufactured products, an industrial enterprise must organically combine the elements of Total Quality Management and Business process reengineering in its activities .

One of the most important factors determining satisfaction with the quality of the products produced by the enterprise is the availability of a service service.

According to [21], the service helps the buyer to choose the most profitable option for purchasing the product, as well as its use . Service is an important element in the competition for the consumer.

We believe that service is the most important condition for the promotion of goods on the market and contributes to the consumer's subjective assessment of the quality of these goods.

According to [22], the economic feasibility of customer service is determined by the following reasons :

- 1)The competitiveness of vars in the market depends on the quality of service.
- 2) Good service helps to increase the company's credibility in the market.
- 3) Good service helps to retain old customers and attract additional customers.

To implement an effective service policy at the enterprise, according to [23], it is necessary to:

1) Development and implementation of corporate customer service standards at the enterprise.

2) Availability of an optimal service pricing policy . The service should first of all contribute to increasing the confidence in the company's products among its consumers

3) Ensuring the level of service in accordance with the characteristics of each market segment.

4) Prompt provision of the service service with the necessary spare parts.

5) Collection and analysis of information about the equipment that is in use by customers (terms of use , personnel qualifications, customer complaints and suggestions, the duration of operation of the equipment).

2 Methods

During the implementation of this research work, the authors used an analytical method, which made it possible to consider the issues studied in the article in their unity and development.

Taking into account the goals and objectives of the study, the authors used the structural and functional method of scientific cognition.

As a result, the authors were able to study some problems related to the impact of service maintenance on the quality indicator of manufactured products.

3 Results

According to [3-5], quality is a comprehensive and universal concept that implies not only the quality of services rendered or goods consumed by consumers, but also the quality of life, human relations and the external environment.

We believe that for consumers, the quality of products produced by the enterprise is subjective, and therefore, to improve the quality of products, it is necessary to increase its consumer value for existing and potential consumers .

The reason for writing this article was an appeal to us by the head of the company that builds and sells computer equipment, "Vasily and Society" LLC. This company purchases components for computer equipment, carries out assembly, configuration and preparation for operation. The company has qualified certified specialists, the purchased components for computer equipment undergo extensive testing before installation. Thus, the computer equipment produced by the company was of good quality and was in demand among consumers. The company provided a manufacturer's warranty for the manufactured products for a period of one year.

However, with the beginning of the Covid-19 pandemic, the company "Vasily and Society" LLC began to reduce sales, while the quality of the products produced by the company did not decrease.

The management of the company "Vasily and Society" LLC was interested in how much it is necessary to improve the quality of products to increase sales.

At the beginning of the study, we conducted a survey of the company's customers with the knowledge of the management of the company "Vasily and Society" LLC.

The results of the survey showed that: 11% of the company's customers do not see the point of buying new computer equipment, since they intend to use the existing one for 5-7 years . 46% of the company's customers reported that due to the forced transition to remote operation of most employees, there was a need to provide round-the-clock operational access to the company's information base . To do this, many enterprises began to rent dedicated servers on various hosting services, including foreign ones. Even small enterprises with 3-5 employees have switched to this mode of operation. Renting a remote dedicated server allows the company not only to provide all employees with access to the company's information base, but also to reduce the costs associated with paying system administrators. If necessary, the technical parameters of the leased dedicated server can be quickly changed based on the tasks facing the enterprise. To work on a rented dedicated server via a remote desktop, the performance requirements for employees ' computer equipment are reduced, and you can use outdated computer models , tablets, and even smartphones. Therefore, given the difficulties associated with the Covid-19 pandemic, these customers decided to temporarily abandon the purchase of more productive computer equipment and continue to use the available equipment, despite the fact that it is to a certain extent obsolete.

Based on the data from the survey of clients of "Vasily and Society" LLC, we conclude that due to the negative impact on economic processes from the Covid-19 pandemic, the subjective perception of consumers about the quality of computer equipment has changed.

If earlier the majority of consumers considered high-quality new high-performance computer equipment, which should be changed in 2-3 years due to its obsolescence, now consumers began to consider higher-quality computer equipment, which allows it to be effectively operated for 3 or more years, based on their needs of the enterprise.

To solve the problem of increasing sales, we have proposed the following measures:

1) Offer consumers for an additional fee to extend the warranty period for the purchased computer equipment for up to two years.

2) Apply to the company's customers with a proposal to modernize previously purchased computer equipment in order to increase its productivity and increase its service life.

As a result of the practical implementation of our recommendations, the company "Vasily and Society" LLC was able to increase its sales volumes by 14% in the first quarter of 2021.

4 Discussion

To ensure the high quality and competitiveness of the products produced, the company must effectively operate a product quality management system. Which should include:

1. Product quality management at all stages of its production, as well as at all levels of production process management at the enterprise.
2. Product quality management should be comprehensive, including the implementation of economic, organizational and technological measures.

A comprehensive quality management system at the enterprise should be based on the quality standards adopted at the enterprise.

The quality of the products produced by the enterprise from the point of view of consumers is a subjective concept and depends primarily on the degree of usefulness of the products for a particular consumer.

The company should monitor the consumer preferences of customers in order to be able to take measures to improve the assessment of the quality of the products produced from the point of view of potential buyers.

5 Conclusions

The stable state of the quality level of the products produced by the enterprise is provided by a complex of organizational, informational, technical and economic measures.

Service is an important element in ensuring the successful promotion of products on the market.

The organization of effective service requires the coordination of marketing, technical and commercial activities, taking into account consumer preferences.

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