

GENERAL GUIDELINES FOR QUALITY MANAGEMENT AND TECHNOLOGIES IN THE METALLURGICAL INDUSTRY SUPPLY CHAIN

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Abstract

In this article, a model supporting the quality management and technological processes of the supply chain in the metallurgical industry has been developed. This model is general and universal in nature, and the recommended guidelines can be implemented in various manufacturing companies. The assumptions of this model were developed on the basis of observations of Mexmash enterprise, one of the largest metallurgical plants in our region. This developed model leads to a significant improvement in the activities of metallurgical industry enterprises in terms of building effective forms of communication with customers, implementing logistics processes based on customer requirements, and providing high-level customer service. The supply chain aims to minimize inventory levels and raw material costs while maintaining the highest quality standards. The production logistics activity of the subsystem is aimed at increasing the efficiency of production processes, at the same time increasing quality standards and reducing the number of inconsistencies. In turn, the distribution subsystem integrates logistics processes, marketing, and quality to improve overall customer service.

Keywords: quality management, technology, supply chain, metallurgical industry, quality management systems, raw materials, supply chain,

Today, the continuous development of the world's metallurgical industry, competition and globalization increasingly determine the issue of ensuring the optimal level of product quality and the competitiveness of the entire supply chain in the development of new technologies. Although the development of product quality in some manufacturing enterprises can continue based on the implementation of some standardized quality management systems, the issue of the entire supply chain remains more complex. Each of the logistics sub-systems has its own specific goals and is ultimately formed differently depending on the quality of the product being produced. [1] The supply chain aims to minimize inventory levels and raw material costs while maintaining the highest quality standards. The production logistics activity of the subsystem is aimed at increasing the efficiency of production processes, at the same time increasing quality standards and reducing the number of inconsistencies. In turn, the distribution subsystem integrates logistics processes, marketing, and quality to improve overall customer service. It should be noted that transport and logistics processes effectively implemented in these subsystems are one of the most important factors for increasing competitiveness. [2] Private logistics subsystems need to develop optimal quality standards and effective technology management to achieve their goals and this requires a systematic approach [3].

All organizations working in the supply chain should pay attention to the equipment, methods and tools used to create joint complex systems and technologies of quality management. Researcher D.Malindžák [4] also expressed the same opinion that it is very important to develop logistics processes based on the latest technologies and quality management concepts in metallurgical industry enterprises. According to Pacana et al. [5], various methods, techniques and quality management systems have been developed in recent years to simplify operations and logistics processes and bring good benefits to organizations. Standardized quality management systems [6] and technology development support methods [7] stand out among them. According to the authors, the use of these tools further increases the efficiency of logistics processes, which ensures their full integration into the supply chain. Researcher M.Nowicka-Skowron and R.Ulewiczlar [8] confirm the above opinion, according to which they emphasize that quality management and logistics processes interact with each other and do not penetrate each other. The high quality of the manufactured product and the effective implementation of the logistics service do not affect the final success of the supply chain. Only the interaction of these elements allows the organization to operate effectively in the market and attract new customers. An important factor in determining final quality is cooperation and a similar understanding of quality for all participants in the supply chain. In general, the concept of quality management should be understood as a sequence of actions that lead to continuous improvement of internal processes based on the requirements of internal and external customers.

The main goal of the study was to develop a model that supports quality management and technological processes in the supply chain. The instructions of this model are sufficiently general and universal in nature to be able to be implemented in various manufacturing companies. It should be noted that quality management in large supply chain enterprises is very complex. The developed model does not simplify this process, but organizes its elements and allows more effective implementation of the adopted goals in the entire supply chain. This model is based on quality management systems, methods and their combination, which interact to improve the efficiency of logistics processes. The assumptions of the model were developed during the research conducted at the Mexmash enterprise, one of the largest and prominent factories in the region. In addition, it is one of the largest and most advanced open die casting plants in the region. Their products include aluminum and zinc die castings for the appliance manufacturers, construction industry, consumer electronics sector, power engineering and automotive industry. This facility also offers specialist CNC machining, research and laboratory testing services. With more than 40 years of experience to date, this company has a thorough expertise in casting based on its manufacturing processes and patents. Many years of tradition and experience allow the company to meet the requirements and exceed the expectations of customers. The correct selection of production processes and their implementation are guaranteed by design engineers, process engineers and the quality control department. In order to achieve the set goals, the following tasks were performed during the practice:

- An analysis of various quality management systems implemented in Mexmash and the company's supply chain activities was conducted;
- Methods of integration of quality management systems were introduced in detail;
- System processes were analyzed and a plan of proposed measures for improvement was drawn up,
- a complex model of the quality management structure was developed,
- obstacles and limitations in the implementation of the model were identified.

A model of quality management and technology in the supply chain - assumptions

According to scientific researcher Zimon, logistics subsystems provided with quality management concepts and technology and properly organized and managed have a significant impact on the process of production and distribution of products.

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