MODERN QUALITY MANAGEMENT SYSTEMS OF ENTERPRISES BASED ON THE INDUSTRY 4.0 CONCEPT

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One of the promising directions for the development of enterprise quality management is the quality management system (QMS) based on the concept of Industry 4.0, which was created during the fourth industrial revolution.

The fourth industrial revolution is a concept that means the development and merging of automated production, data exchange and production technologies into a single self-regulated system, with minimal or no human intervention in the production process [1].

The key technologies of Industry 4.0 include: artificial intelligence, Internet of Things (IoT), robotics and collaboration, smart factory (Smart Factory), unmanned vehicles, simulation technologies that are augmented with reality, cloud technologies, bioengineering and new materials, analysis of large databases , unlimited Internet access, etc.

The company's quality management system is in constant development. Under the influence of digital technologies and the implementation of the ISO:9001 series of standards, maintaining a paper-based QMS document flow becomes insufficient to ensure the continuous improvement of the system [2]. There is a transition from the application of the traditional concept of quality management to the concept of Quality 4.0. Within the framework of the modern enterprise's QMS, tasks are set for the implementation of such tools as electronic document flow, software modeling of business processes, the use of electronic documents, software, information technology (IT), the use of analytics and artificial intelligence, processing and analysis of large databases (Big data), implementation of key performance indicators (KPI).

To ensure the functioning and constant improvement of the enterprise's QMS, it is important to carry out work on optimization and automation of business processes and organize a data collection system for their monitoring. Thus, the analysis of modern methods of automation of monitoring of business processes becomes a relevant topic for research and further application and implementation at enterprises. Let's consider

the concept of Quality 4.0, its difference from the traditional concept and the main elements and principles. The term Quality 4.0 was first used by the analytical company LNS Research in 2017 and meant a collection of the latest quality management practices and tools used within the framework of the fourth industrial revolution [2]. In the modern world, the stage of Industry 4.0 has arrived, which involves the introduction of digitalization, the unification of people, technologies, equipment and data in a single virtual space [2]. Accordingly, approaches to quality management are also changing.

The main stages of implementation of the principles of the Quality 4.0 concept are:

1. Transition to electronic document management.

2. Automation of business processes and management system.

3. Application of Quality 4.0 technologies when working with interested parties.

4. Collection, processing and analysis of big data within the control of the company's QMS.

5. Application of risk-oriented thinking in accordance with the requirements of the international standard IEC 31010:2019 (Risk management - Risk assessment techniques).

6. Development of solutions for continuous improvement of the system.

Thus, the concept of Quality 4.0 does not replace traditional quality management methods (developed within the framework of enterprise quality management systems), but is rather built and improved on their basis.

References:

1. Schwab K. The Fourth Industrial Revolution. – New York : Crown Publishing Group, 2017. – 192 p.

2. Dan Jacob. What is Quality 4.0. – URL: https://blog.lnsresearch.com/ quality40.