Гусев Сергей Иванович
аспирант
Жукова Юлия Владимировна
старший преподаватель
ФГБОУ ВО «Ульяновский государственный
технический университет»
г. Ульяновск, Ульяновская область

КАЧЕСТВО И ИНЖЕНЕРНЫЙ МЕНЕДЖМЕНТ

Аннотация*: в статье рассматриваются основные аспекты подходов в менеджменте организации и их способности к формированию новых компетенций. Основное внимание уделяется важности современных инновационных и коммуникативных технологий для логистически сложных инфраструктурных систем транспортной индустрии.*

Ключевые слова*: менеджмент качества, транспорт, информация, инженерный менеджмент.*

QUALITY AND ENGINEERING MANAGEMENT

Abstract*: the principal aspects of existing approaches to management of organization are considered and their ability to form new competences is stressed. The major part of the attention is paid to the importance of modern innovation and communication technologies for logistically complex infrastructural systems of transport industry.*

Keywords*: quality management, transport, information, engineering management.*

Quality is the global concern of manufacturers. However, the quality of the word was different connotations when used by different people and the definition has also changed and its meaning extends over time, but it can definitely be called an attribute that is commonly used to reflect the degree of excellence in production product. It is easy to understand that this degree perfection is inversely proportional to variability present in the process. All manufacturing processes attract materials, people and cars

and they all have some element of inherent variability in addition to attribute variability which may be controlled to a minimum of economic minimum.

Reducing production variability is synonymous with improved product quality. The reason for changing the material can be traced to inadequate care when purchasing material (quality assurance) or due to poor material specifications or because of the urgency of the purchase compromise of quality characteristics, etc.

The source of variation due to the machine is the natural limits of the possibilities that each process has, which is also known as process / machine ability and any attempt to reduce this range will be worth in monetary terms. If the process unable to accept acceptable work within design limits then we have the ability to separate mismatch of the relevant products using more accurate process or design change product or system to achieve optimal design at the lowest total cost.

The third source of change is the man himself and is the most important factor influencing variability. AT Fact human decisions or actions directly affect the degree of variability to a very large degree.

The basic principle of total quality management is a systematic approach, a process approach, decision making based on bits and aimed at achieving long-term success by meeting customer needs and providing benefits to the organization and society. The main goal of the quality specialist is closely related to the responsibilities of the information technology specialist. They complement each other, and this is clearly manifested in the reorganization and integrated implementation of systems and technologies in any construction or transportation organization. Before solving problems, it is necessary to describe the business processes that are intended to form the basis of the quality management system. Any component of the system can be changed (software, automation forces, work technology, specialists involved in the process), but the process itself does not change.

Today, qualitative changes take place in all spheres of life and economic activity. This is due to the introduction of new production means. The economy ranks fourth in

the industrial revolution and Industry 4.0 (the power of the Internet of Things) in terms of its characteristics in ten technological directions: horizontal and vertical system integration of infrastructure and logistics structures; Internet of Things; cyber security; clouds; big data analysis; modeling; additive production (3D printing); augmented reality; robots; Intellectual management.

All this means new challenges for specialists in the field of quality and production management. Efficient road solutions require highly qualified specialists. Such a specialist should have professional engineering competences and competencies in the field of quality management, economics and IT-technologies. Professional competence is systems thinking, interdisciplinary communication, project management, lean manufacturing, information and communication technologies, robotics, artificial intelligence, programming, relationships with people, work under conditions of uncertainty, risks, creativity skills, environmental thinking. However, the current state of Russian education is characterized by an insufficient level of training of technical specialists in the field of economics and management. There are numerous attempts to transfer leading management positions in high-tech areas to so-called «professional managers», most of whom do not have the necessary engineering knowledge and systems thinking, which affects the efficiency of complex technological production, information systems and quality management systems.

The engineer must study the modern approaches to the management of the organization. They can help to form new additional competencies and build a theoretical and practical basis for training an engineer. Currently two areas of development are identified: information systems with a special focus on their «human» component and the use of formalized description methods of real-world objects in languages, on the one hand, close to natural, on the other in order to provide a simplified «machine» representation (programming).

Standards, sets of recommendations and models of IT-services management-ISO 20000, COBIT, Information Technology Infrastructure Library (ITIL), capacity

maturity model, etc. have appeared. Standards are constantly being updated, and the corresponding methods of objective assessment are complemented.

Experts pay great attention to the models of maturity of production processes. In the mid-1980s, the company's first maturity model, the Capability Maturity Model (CMM), was developed by Carnegie Mellon University (SEL) on the initiative of the US Department of Defense. The purpose of its creation was to ensure a predictable level of quality of third-party software by ranking them by the efficiency of internal production processes. The ideology of the project is the main principle of the theory of quality: a quality product can be produced only if there are high-quality manufacturing processes. The basis of the original version of the model is the Quality Management Maturity Grid-QMMG matrix proposed in November 2011, the following version-1.3 CMMI (I-integration or combined) was released, which contains five levels of organization maturity: elementary; managed; regulated; quantitatively controlled; optimized.

Developing the maturity of an organization means improving the quality of services or products, reducing risks and personal dependence, reducing internal and external conflicts and moving from project management to process management.

Almost any functioning system (organizational, informational, mechanical, electronic, etc.) is a complex system and, as a result, cannot be effectively analyzed, predicted and controlled, since it often consists of millions of elements that dynamically interact with each other. Quality management systems, systems of business processes of the organization, the CIS belong to the class of complex systems. Therefore, approaches to their analysis and design are always invariant. One cannot do without a methodology that involves a combination of the vision of the complexity of any object and its inclusion in other systems, depending on the purpose of the study. At the same time, the division of the real world into separate systems and the level of detail are determined in accordance with the understanding of the limitations of consideration, by the will of the observer, based on the short duration of his activity, and should change with the initial settings. When developing functional requirements for an

automated system, it is necessary to choose the level of consideration (level of detail) correctly. At this stage of design, the system appears as a whole interacting with other automated systems and users – the so-called «black box».

In practice, a large number of standard schemes are used to illustrate the processes. These include, for example, IDEFO diagrams which allow a standard graphic language to describe a sequence of operations. The system of organization includes the performers, the tools and equipment they use, the methods and procedures of work.

The range of tasks that can be solved with the use of information technology and the transfer of an increasing number of business processes into digital form is expanding. The role of IT departments is changing radically. The company's success today largely depends on how effectively and efficiently its IT service helps to solve managerial tasks, maintain competitiveness and meet the growing demands of consumers. For the quality of services, it is necessary to clearly define the range of services provided and make them available to those who need them.

Organization of safety and quality control are two main tasks for any enterprise. The security of an organization is protection against threats, and quality control is the provision of planned and stable production of products or services. Constantly applied at a professional level, quality control mechanisms should ultimately contribute to enhancing safety.

It is clear that information security objectives and requirements for the quality of products and services should be coordinated and interconnected at a technological level.

It must be said that there are various programs dedicated to quality and engineering management (QEM), the mission of which is to give employees with advanced degrees in technical and non-technical fields the opportunity to get the necessary knowledge and skills to be more successful in all areas of production. The master program lasts 30 hours and can be either with a thesis or without it. The program is 100% online and provides employees with advanced degrees in technical and non-technical

areas with the opportunity to get the knowledge and skills necessary to achieve greater success in all areas of production or increase efficiency in service sector units. The emphasis on leadership provides critical skills for advancing into manufacturing leadership positions.

Specific benefits of the program:

1. Designed to provide academic bachelor's degrees in technology or business with an in-depth study of the organizational, technical, and strategic tools commonly used in manufacturing to increase productivity.

2. Designed for working professionals and other individuals who have a background in one of these fields, but are seeking to expand their knowledge of these disciplines.

3. Emphasizes the use of these tools to solve quality problems, technology deployment, and productivity in manufacturing industries to help manufacturers standardize procedures, measure performance, improve customer satisfaction and manage resources more wisely.

Since the degree is 100% online and is intended for working professionals, students can continue to work during the program. Working for a master's degree is a great way to make it clear to your employer that you are preparing to move up and take more responsibility. Graduates find a natural point for promotion or transition to another better opportunity.

Список литературы

1. Международный стандарт ISO/IEC27001:2005 «Информационные технологии. Методы и средства обеспечения безопасности. Системы менеджмента информационной безопасности. Требования». – М.: ИСО/МЭК, 2005; ЗАО «Технорматив», 2006.

2. Международный стандарт ISO/IEC27001:2005 «Информационные технологии. Свод правил по управлению защитой информации». – М.: ИСО/МЭК, 2005; ЗАО «Технорматив», 2007.

3. Nanda Vivek. Quality management system handbook for product development companies. CRC Press, Baca Raton, 2005.

4. Latino Robert J, Latino Kenneth C. Root cause analysis: Improving performance for bottom-line results. Taylor & Francis, Boca Raton, 2006.

5. Stark John. Product lifecycle management: 21st century paradigm for product realization. Springer Verlag, U.K., 2006.