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PROBLEMS OF MODERN PRODUCT QUALITY MANAGEMENT AT ENTERPRISES OF AZERBAIJAN

Summary. *The article is devoted to the study of modern problems of product quality management at enterprises of Azerbaijan. It analyzes theoretical and practical approaches to improving the quality system, identifies factors that hinder the implementation of modern product standardization systems, such as weak digitalization of processes and a shortage of qualified personnel, and proposes solutions based on international experience and adaptation of best practices. The main attention is paid to the role of metrological control, reforms in the field of standardization and the introduction of new state standards. The impact of these processes on the development of a competitive environment, consumer protection and compliance with international requirements is considered.*

Key words: *quality management, quality control, standards, competitiveness, ISO, metrology, technical regulations.*

Introduction. After gaining independence, Azerbaijan faced the urgent task of regulating the domestic market, developing foreign economic relations and expanding trade cooperation with near and far foreign countries. For this purpose, entrepreneurs were granted the right to independently enter the foreign market, where they faced the problem of assessing the quality and reliability of

their products. In order to implement this policy and solve the problems of entrepreneurs, there was a need for mandatory certification of products, works and services [1]. International experience confirms that certification is the most important tool that guarantees the compliance of products with the requirements of regulatory and technical documentation. Since 1994, the country has begun to implement Resolution No. 343 of the Cabinet of Ministers of the Republic of Azerbaijan dated July 1, 1993 "On the application of certification of products (works, services) by stages", which presented a list of products subject to mandatory certification. At the same time, the practice of voluntary certification based on the manufacturer's request has spread. As a result, the National Certification System AZS, specialized testing laboratories were created and relevant legislative acts were adopted.

Materials and methods. Quality as a concept covers not only the conformity of products to established standards, but also the satisfaction of consumer needs. Quality management includes planning, control, provision and improvement of product quality. Among the most popular concepts of quality management are TQM (Total Quality Management), ISO 9001, Six Sigma and the Taguchi approach to quality engineering.

American scientist Edward Deming developed 14 principles of quality management, emphasizing the importance of a systematic approach and the involvement of all employees in this process [2]. Another American scientist Joseph Juran introduced the "quality triad": planning, management and improvement [3]. Professor of the University of Tokyo K. Ishikawa proposed a cause-and-effect diagram, known as a "fishbone", and the concept of quality management at all levels [4]. A. Feigenbaum, a scientist of American origin, developed the concept of "total quality control", and the American engineer F. Crosby focused on the concept of "zero defects" [5]. The famous Japanese statistician Genichi Taguchi created a method for increasing the resistance of products to external influences during the design process [6].

However, despite the presence of a rich theoretical base, in practice, enterprises face a number of problems, including insufficient qualifications of personnel in the field of quality management; a formal approach to the implementation of ISO and other standards; deficiencies in internal control and employee motivation; limited use of digital technologies in monitoring and improving quality; lack of a quality culture at all management levels.

In the case of Azerbaijan, these problems are exacerbated by weak integration with international markets and insufficient attention to innovative approaches. Such Azerbaijani research scientists as N. Aliyeva, E. Efendiyev and N. Mamedov emphasize the need for a systematic and innovative approach to quality management. Aliyeva focuses on the need for a comprehensive quality assessment system, and Efendiyev - on the relationship between quality and sustainable development of the enterprise. Mamedov points out the importance of certification and standardization in increasing confidence in products [7; 8; 9].

Today, certification has become widespread and recognized in many countries around the world. Certification standards are considered universal tools for confirming the quality of products and services, thereby ensuring the trust of consumers, investors and business partners. Certification is a procedure for establishing the compliance of products or services with established requirements and differs from licensing and other forms of permitting documentation. In international practice, certification is interpreted as a legal and technical mechanism enshrined in the regulatory legal acts of individual states [10].

In the Republic of Azerbaijan, a number of regulatory acts are in force in this area, regulating the requirements for the quality and safety of products. Key documents include the Law "On Protection of Consumer Rights", aimed at ensuring consumer rights by monitoring compliance with the rules of trade and provision of services, as well as the Law "On Food Products" (2000), which

obliges manufacturers to provide complete and reliable information about the product, including its name, manufacturer's address, date of manufacture and expiration date. In addition, the list of products subject to mandatory certification was approved by Resolution No. 343 of the Cabinet of Ministers of the Republic of Azerbaijan dated July 1, 1993.

The National Certification System AZS operates in the country under the State Agency for Antimonopoly Regulation and Control over Consumer Market of Azerbaijan under the Ministry of Economy, as well as a number of testing laboratories authorized to carry out quality control of products. The Food Safety Agency of the Republic of Azerbaijan, established by the decree of the President of the Republic of Azerbaijan dated February 10, 2017, is responsible for the safety of food products throughout the food chain. However, despite the existence of these institutions, Azerbaijan does not have a single structure responsible for monitoring non-conformities and preventing the circulation of low-quality products. For example, in the countries of the European Union, certification functions are transferred to accredited private organizations, in Azerbaijan, certification can be carried out by both state and private companies, but provided that private companies are accredited by the relevant state body. This is also one of the recommendations of the World Trade Organization (WTO), which suggests transferring some of the certification functions to the private sector.

The national AZS certification system of Azerbaijan is recognized in other countries mainly within the framework of international and regional agreements. AZS certificates have legal force in the CIS countries due to Azerbaijan's participation in the CIS Interstate Council for Standardization, Metrology and Certification. In Turkey, Azerbaijani standards are recognized based on bilateral agreements between AZS and the TSE Standards Institute. Some neighboring countries, including Georgia and Iran, can also accept AZS certification within the framework of mutual agreements. However, additional

certification according to CE standards is required for export to the European Union, and compliance with local regulatory requirements (FCC, FDA, UL, etc.) is required for export to the USA, Canada and other countries [11].

International experience shows that foreign manufacturers invest up to 1-2% of total production costs in confirming product quality, considering certification as a prerequisite for entering domestic and foreign markets. In the context of digitalization and tightening consumer demands, some countries have achieved outstanding results in quality management due to a strong regulatory framework, a culture of continuous improvement and the integration of advanced technologies.

For example, Japan has created a unique quality management system based on a philosophical and methodological approach. Thus, the central element of the Japanese system is Total Quality Management (TQM), where product quality is considered as a result of the systemic interaction of all elements of the enterprise. A distinctive feature of the Japanese approach is the deep involvement of personnel at all levels - from top management to ordinary employees - in the processes of ensuring and improving quality. Of particular importance in Japanese practice is the philosophy of kaizen, which involves continuous improvement of production processes through small but constant improvements by means of regular events to identify and eliminate production losses.

The German quality management model, in contrast to the Japanese one, is characterized by an emphasis on regulatory control and technological precision. The German Institute for Standardization (DIN) has developed a comprehensive system of technical standards that have become the basis for many European standards. A distinctive feature of the German approach is the strict regulation of production processes while simultaneously stimulating technological innovation. The TÜV certification system demonstrates the balance between strict quality requirements and support for industrial

development, which is typical for Germany. Within the framework of the Industry 4.0 concept, German companies are integrating advanced digital technologies, in particular artificial intelligence.

The United States of America has developed a unique quality management model based on the symbiosis of advanced control methods and innovative technological solutions. The American approach is characterized by its systematic nature and focus on continuous improvement of production processes. The American quality system is based on the Six Sigma methodology, developed in the 1980s by Motorola and further developed by General Electric. This approach allows achieving less than four defects per million production operations. A significant role in the American quality system is played by a well-developed standardization infrastructure. ASTM International (American Society for Testing and Materials) is one of the most authoritative technical standards development organizations in the world. Every year, ASTM publishes more than 12,000 standards covering virtually all industries. A special feature of the American standardization system is its flexibility and ability to quickly respond to technological changes.

South Korea is a unique example of the rapid development of a product quality management system that has reached a world level in a historically short period of time. This success was made possible by an integrated approach combining standardization, government support, and technological modernization. The foundation of the Korean quality system is the national KS (Korean Standards), developed taking into account international requirements and harmonized with leading standardization systems. Of particular importance is their adaptability to rapidly changing technological realities, which ensures constant compliance with global trends in the field of quality. Active government policy played a key role in the development of the quality system. The Korean Quality 4.0 program is a strategic initiative combining regulatory measures, financial support, and educational projects [10].

Results. For developing economies, including Azerbaijan, studying international experience is of particular value. The most important lesson is that high product quality is achieved not by individual measures, but by creating an integrated ecosystem that combines regulatory frameworks, government support, corporate culture and technological development. It is this systemic approach that allows transforming quality from a production parameter into a strategic competitive advantage in global markets [12].

Certification facilitates the expansion of trade and economic relations, increased competitiveness of products and consumer confidence. Products that do not meet the established requirements are in some cases subject to mandatory certification in accordance with current legislation. The certification procedure is usually carried out by independent third parties. In the event of a positive result, a certificate of conformity is issued, which serves as official confirmation of the admission of products to regulated markets. European standards such as CE, ISO, etc. have become widespread and are used not only in the EU countries, but also in the USA and other countries.



Scheme 1. ISO requirements (using ISO 9001:2015 as an example) [12]

For products that do not fall into regulated categories, voluntary certification is possible at the initiative of the manufacturer. Such certification may be required when concluding contracts, as part of consumer requirements, or for marketing purposes, as a confirmation of compliance with voluntarily declared standards.

Discussion. As part of the implementation of the State Program of Azerbaijan to bring the national standardization system in line with international requirements (2023-2025), active work is underway to develop reference standards. Thus, drafts of 34 national technical regulations are at the discussion stage, of which 27 are already ready. In addition, a list of 5,192 reference standards consistent with international practice has been prepared; coordination mechanisms are being strengthened between various ministries and departments, including healthcare, transport, ecology, energy, agriculture, etc. The introduction of "standards" in Azerbaijan is an important event, since the

favorable investment climate in Azerbaijan serves to increase the number of foreign investment companies. These companies turn to foreign countries to determine the compliance of measuring instruments with technical requirements because Azerbaijan does not have state units of measurement (standards). Local companies spend a large amount of money on these services in foreign countries, and after the creation of such a center in our country, these costs will be more than 10 times lower for them. These measures are aimed at forming a modern laboratory network, assessing the conformity of products, organizing the service sector and increasing confidence in national products in both the domestic and foreign markets. The Azerbaijan Institute of Standardization (AZSTAND) has already begun work on developing and approving the "National Standardization Program for 2026-2028".

According to official statistics for 2024, there are 26,742 national standards (AZS) in the country, including adapted GOST and ISO. The number of international standards (ISO / IEC) is 5,312 with an annual growth of 15 percent. Technical regulations mandatory for the oil and gas sector, construction, food industry amount to 214, while ISO 9001 certificates amount to 1,856 items with an increase of 22% per year [11].

Azerbaijan is also actively establishing cooperation with international metrology institutions from Turkey, Germany, the Czech Republic, Kazakhstan, Ukraine, Uzbekistan and other countries, which allows introducing advanced practices and innovations into the national quality control system.

Conclusion. Quality management remains one of the central tasks of modern management. Despite the achievements of theory and the existence of standards, enterprises face a number of challenges. The use of a systematic and innovative approach based on best practices and scientific developments will significantly increase the competitiveness of products and business sustainability.

The development of a quality control and standardization system in Azerbaijan plays a key role in strengthening economic stability, expanding export opportunities and creating a favorable business environment. An integrated approach, including international cooperation, legal reform, technical modernization and environmental responsibility, forms the basis for sustainable socio-economic development of the country in the long term.

As we can see, Azerbaijan is making significant strides in standardization, combining international practices with digitalization. These measures strengthen confidence in local products and facilitate the entry of companies into global markets.

References

1. Квалиметрия и управление качеством. Учебник. Под ред. проф. Мамедова Н.Р. Баку, ЭЛМ, 2007. 326 с.
2. Deming W. E. Out of the Crisis: Quality, Productivity and Competitive Position, MIT Press, 1986.
3. Juran J. M. Juran’s Quality Handbook. McGraw-Hill, 1999.
4. Ishikawa K. What is Total Quality Control? The Japanese Way. Prentice Hall, 1985.
5. Crosby P. B. Quality is Free. McGraw-Hill, 1979.
6. Taguchi G., Chowdhury S., Taguchi S. Robust Engineering. McGraw-Hill, 2000.
7. Алиева Н.Р. Проблемы повышения инновационной активности в аграрно-перерабатывающих отраслях Азербайджана. Баку, 2022.
8. Мамедов Н.Р. Основы стандартизации: Учебник для вузов. Баку: ЭЛМ, 2002.
9. Эфендиев Э.М. Стандартизация продукции (легкая промышленность): учебное пособие. Баку: МПП Тахсил, 2007.

10. Эфендиев Э.М. Опыт ведущих стран в области менеджмента качества. Качество и менеджмент. Баку, 2009. № 1.
11. Официальный сайт «Азерстандарт». URL: www.azstand.gov.az
12. ISO Survey 2023 – Global certification statistics.