

Quality management technologies of railway transport services

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Abstract. The relevance of the research topic is stipulated by the crisis phenomena that are taking place in the development of the transport industry of Ukraine, which are caused both by the aggravation of internal contradictions in the development of subjects of this sphere, and by the influence of external negative factors related to the economic and political crisis in the country. The purpose of the work was to determine the problems of managing the quality of services provided in railway transport sector. The features of modern transport services have been determined, the issue of effective training of personnel in the conditions of using advanced training technologies has been raised, and the characteristics of the provision of services by JSC “Ukrzaliznytsia” has been provided. Based on economic-mathematical models, it has been proven that the profit dynamics of railway transport enterprises depends to a large extent not only on their technical and technological capabilities, but also on socio-economic factors regarding the need and possibility of using technologies for managing the quality of services. It has been determined that the above-mentioned discrepancies and problems significantly affect the level of service quality management technology of enterprises in this sector. A conclusion has been made about the need to increase the efficiency of service quality management technology of railway transport enterprises based on the use of modern approaches to the comprehensive study of consumer needs and further improvement of consumer qualities of transport services in order to generate profit, increase the social significance of railway transport and obtain competitive advantages in the future. The results of the study can be used to develop a state strategy for regional development, as well as to devise plans and recommendations for the development of railway transport enterprises at different levels of management

Keywords: enterprises, railway industry, standard forecasting, management

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● INTRODUCTION

As a result of the aggravation of internal conflicts within the subjects of this sphere’s development as well as the influence of externally harmful factors linked to economic and political instability in the nation and the world, Ukraine’s transport industry is currently facing extremely challenging times. But the development of transport infrastructure, which is essential for nearly all sectors of the national economy, is closely related to Ukraine’s economic situation. In turn, in order to develop the railway transport, it is necessary to resolve concerns with Ukraine’s railway industry’s integration into the European transport system and raise the standard of services offered by businesses. The processes of globalization and Ukraine’s integration into the global economy necessitate new approaches to managing Ukraine’s transport system, in which railway transport has always played a crucial role and continues

to do so. This is due to Ukraine’s significant potential for transit and one of the largest rail networks in Europe. Effective management of the level of services, provided by railway transport companies, promotes national economic growth and the resolution of several social and economic issues. The management of railway transport firms must thus continuously enhance the forms and methods of management due to the complexity and instability of the macroeconomic environment.

Although the structure of service quality management technology in its many forms and techniques is primarily a practical endeavour, there is a substantial theoretical and scientific foundation for the analysis, which has been provided in the research of several scientists from both Ukraine and abroad. In-depth examinations of the evolution of the idea of BPM (business process management)

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are offered by H.A. Reijers [1]. The practical and theoretical recommendations for using the concept of TQM (total quality management) were published in the works of I. Othman [2] and J.L. Roldan [3]. H. Obruch [4] studied service quality management in transport companies. The article by M. Garayev [5] examines the essence of transport services at the current stage, when railway transport of Ukraine is a part of the global transport system. Principles of the theory of production optimization at the level of small and medium-sized enterprises have been analysed by K. Antosz [6]. E. Nedeliakova's [7-8] research provides the analysis of current developments in the field of process-based quality management. The work of I. Stravinskienė & D. Serafinas [9] is particularly notable as it offers a systematic investigation and comparative analysis of quality management principles and business procedure management. It also looks for the methodical place of business process administration within the framework of a quality management system. The potential use of IT tools in the process of quality management in the field of service delivery is examined in R. Jankala's work [10], which is justified by the dynamism of the service market and the significance of the service "quality" attribute in the context of ensuring the survival of players in this market. The presence of a significant theoretical-methodological basis in the field of organizing the process of quality management technology determines the relevance and need for a certain structuring of the accumulated knowledge, as well as the demarcation of the problem field of the analysed area. The purpose of this work was to solve the problems of quality management of railway transport services.

● MATERIALS AND METHODS

The research methodology includes the ontological analysis of the field of service quality management technology regarding the methodological toolkit of applied implementation of the main theoretical developments in this field, the method of synthesis and predictive assessment of trends in the development of service quality management technology in the conditions of the formation of a high-tech environment. The analysis of service quality management technology in the transport industry has been carried out on the example of JSC (joint-stock company) "Ukrzaliznytsia". The works of Ukrainian and other scientists served as a theoretical foundation for the present research.

In the course of conducting the study, different methods were used: statistical analysis, formalization and techno-economic analysis. Tabular and graphic methods were used to summarize the research data. This made it possible to visually compare retrospective and prospective values of quality indicators of railway transport services. A considerable amount of literature was used as research material, namely 22 sources, including the works of Ukrainian researchers and articles by researchers from other countries on this and similar issues, in order to consider the vision of the problem on a global scale and to analyse different approaches and standards, for which the analytical method was also used. The report of the State Statistical Service of Ukraine on the state of transport in Ukraine in 2020 was also analysed.

Using the methods of analysis and synthesis, various international standards have been analysed in detail,

both in their individual aspects and in general, which has allowed this study to verify the importance of individual standards and the feasibility of their application to improve service quality management, using the example of railway transport companies. In order to draw conclusions of the study, the abstract-logical method was used, which is often used in articles that examine a particular sector of economic activity in the country.

● RESULTS AND DISCUSSION

For the effective organization of product quality management at railway transport enterprises and the construction of a quality management system for them, it is necessary to have a clearly defined object of management, as well as defined categories of management, that is, phenomena that make it possible to better understand and organize the entire specified process. The structure of the modern quality management process consists of the following functions:

1. Quality planning: the aspect of quality management that focuses on establishing quality goals, identifying the operational procedures required, and allocating appropriate resources to attain those quality goals.

2. Quality Assurance: the function of quality management that focuses on ensuring that quality requirements are met, offering assurance in this regard.

3. Quality management: the function of quality management that is directed towards meeting quality specifications.

4. Quality improvement: a function of quality management aimed at increasing the ability to meet expectations that focuses on enhancing the capability to satisfy quality requirements [11]. The creation, functioning and development of the quality management system are carried out based on the following principles:

Customer orientation. A key stakeholder for the railway industry is the users of its services. The main categories of consumers of JSC "Ukrzaliznytsia" services are: consignors, consignees, railway rolling stock operators and passengers [11]. The current and future needs and expectations of these main categories of consumers of transport services depend on the specifics of cargo, regions of the country, the season for the provision of services and other factors. The study of the current and future needs of the main categories of consumers is carried out on an ongoing basis by the relevant divisions of transport companies. Fulfillment of customer requirements is a key objective of the operational processes of the quality management system and is ensured through the implementation of a compliance strategy. Particular attention is paid to the process of designing services based on the study of the current and future needs of the main categories of consumers [11]. The implementation of this principle at transport enterprises is carried out through the standardization of consumer requirements, monitoring their satisfaction and strict compliance with established requirements. Exceeding customer expectations is achieved through the implementation of a continuous improvement strategy.

Leadership. The leaders of transport companies ensure the unity of purpose and direction of the company. They establish and uphold an internal atmosphere where employees can actively engage in the organization's tasks. The effectiveness of the quality management system is

determined by the personal responsibility and degree of participation of managers at all levels of management in its creation, operation, and development. The leaders of transport companies at all levels should move from the system of control, coercion, and punishment to the system of setting agreed goals based on the strategic goals of the company, create an environment for involving all employees in the process of achieving these goals and provide them with necessary resources.

Employee engagement. The transport company should consider its employees as one of the most important stakeholders and a key resource. The development of competence and advanced training of personnel is one of the main tasks of the quality management system. Creation of conditions in which the company's employees would feel economic security, could satisfy their needs for respect, recognition, and self-realization, which are priority areas in work with personnel. These priorities, along with personal motivation and employee loyalty, form the basis for engaging employees in the process of continuous improvement. The involvement of employees in the activities of a transport company is achieved through the delegation of greater independence and authority under greater responsibility and self-control, as well as the creation of an appropriate motivational environment.

The process approach is a fundamental principle of the quality management system. Managing the transport company's activities through a system of interrelated processes ensures the required level of its service quality. Comprehending and overseeing interconnected processes as a system enhances efficiency of the company's operations and ensures the successful achievement of its strategic goals, as well as the satisfaction of stakeholders' interests. In accordance with the enlarged scheme of the integrated process model, the processes of the quality management system, located in the automated control system for modeling business processes, include management processes, core business processes and supporting processes [11]. Process management is performed by process owners. The quality management system establishes the roles, powers, responsibilities, and interactions of process owners. A system of key process performance indicators is established to monitor and manage each process.

Continuous improvement of activities. The principle of continuous improvement of the transport company's activities is implemented through the elimination of the causes of identified inconsistencies and problems in the company's processes with the help of corrective actions, as well as through the continuous improvement of process capabilities (the ultimate ability of processes to achieve results). The main approach to continuous improvement is the implementation of risk management, which involves the identification and assessment of risks, as well as the choice of methods and tools to minimize the identified risks. This is especially true when it comes to ensuring the security of provided services [9]. The implementation of the principle of continuous improvement also implies the creation of an internal environment that provides for the opening of improvement projects, the motivation of employees to work in project teams and the rewarding of project team members. Continual improvement can be applied to: indicators of products and services; indicators of the results of

production processes; indicators of the results of management processes [11].

Evidence-based decision making. To obtain objective evidence, the transport company's factual data related to its activities are analyzed using modern methods, such as Pareto analysis, Ishikawa chart, histogram, special graphs, etc. [11]. All management decisions in the transport company are based on the obtained objective evidence, documented in the prescribed manner.

Relationship management. Management decisions in the transport company are made based on determining the satisfaction of interests of all parties involved: shareholders, state, society, end consumers, suppliers and employees of the transport company, etc., taking into account the balance of interests. Satisfying the interests of stakeholders is implemented through a system of strategic planning and goal setting, considering the balance of interests. The system of goals and their achievement is guided by the priority of stakeholders' strategic interests. Transport companies build long-term mutually beneficial relationships with suppliers based on information transparency, improving the procedure for jointly solving problems related to the operational and economic characteristics of the products or services supplied.

In the last quarter of the 20th century, Europe turned most actively to solving the problem of Quality Management to Quality of Management [12]. The ISO 9000 family of standards has been developed to help companies, regardless of their profile of activity and size, implement effective quality management systems (QMS). According to the International Organization for Standardization in 159 countries, over 560,000 certificates have been issued for quality management systems [12]. The updated version of the series includes: ISO 9000; QMS; basic provisions and vocabulary. It introduces quality management systems and a glossary of terms and definitions.

ISO 9001. QMS. Requirements. It establishes requirements for quality management systems. **ISO 9004. QMS. Performance Improvement Guide.** The further development of the constructed quality management system is considered to achieve continuous improvement of business activities and organization management on the principles of TQM. **ISO 19011 Companion standard.** It provides the guidelines for conducting audits of the quality management system, as well as the requirements for auditors. **ISO 10012 Companion standard.** It defines requirements for instrumentation and test equipment.

A company capable of presenting a certificate of the ISO 9000 series has the most undeniable recommendation, since the certificate for compliance with ISO 9000 standards is an official confirmation of the quality assurance of products, works and services [12]. ISO 9000 certification is a token of the company's dynamic development, which suggests its value in the eyes of potential customers and partners. Almost 100% of IT companies' offices are decorated with ISO 9000 series certificate, conveying the image of "companies of the future". ISO standards are advisory. However, some standards (for example, on health, safety, environmental protection) are adopted by several countries as mandatory [12]. Successful management is achieved by implementing and maintaining an appropriate management system that is designed to continually improve

performance. The purposes of the quality system are as follows: to improve the enterprise's activity; to ensure customers' confidence in the quality of the products received.

In accordance with the ISO 9000 family of standards the quality management system of foreign railways is based on four principles [12]:

1. Quality standard: development and approval of the standard; development and approval of the standard for tools; commissions on quality standards and methods.

2. Quality monitoring: quality monitoring through a quality information system with operational control; evaluation of projects and activities; coordination of quality projects in the company.

3. Quality audit: audit of production processes on the instructions of the company's board; audit of the product (services) on the instructions of the board.

4. Quality assurance: procurement quality system; means of quality control; registration of quality change.

The quality monitoring used in operational work implies almost in the first place: monitoring the degree of customer satisfaction with the company's services; monitoring the demand for services, including new ones; monitoring the quality of production and operational processes (schedule execution, accuracy of arrival, etc.). Quality monitoring on railways is temporary: daily, weekly, etc.

American railroads have been implementing ISO 9000 series standards since 1996 and are now adopted by almost all railroad departments. The indicator of one worker per kilometer of railroad tracks in America is one measure of performance. The foundation of the United States railroad quality system is the M-1003 regulation, which is one of the subsections (subsection "J") of the Standards and Recommended Practices Manual (MSRP). This document is updated regularly. The work on its adjustment and updating is carried out under the general supervision of the Technical Committees of the Azerbaijan Railways with the active participation of the Department of Technical Inspections of the Center for Transport Technologies [13]. Monitoring is carried out based on automated control systems, which are available for almost all types of activities. Apart from performing their specific tasks, these automated control systems are also included in the quality management system through monitoring.

This approach to quality management should be considered in more detail on the example of one of the largest US railway companies Norfolk Southern (NS). NS has implemented a Branded Transportation Service Plan, which aims to increase traffic while maintaining its quality. This plan is constantly being improved and extended, supplemented by several other important quality improvement tools. These tools include the Automated System for Coal Transportation Management, which is currently used to monitor not only coal, but also grain transportation, as well as the Automated Strategic Management System for Intermodal Transportation. Another program, the Unified Traffic Control System, was developed by the company in conjunction with the General Electric Corporation. It is a network of dispatcher workstations compatible with other information systems used on the Norfolk Southern railway. Currently, the System of Optimal Train Traffic Control is being prepared for testing. In addition, NS is implementing the LEADER locomotive computing system, the main task

of which is to increase the efficiency of fuel consumption for train traction and improve the safety conditions for managing a train during its movement. Ultimately, it is planned to use the LEADER system as one of the subsystems of the OTC system. The Norfolk Southern Railroad has an automated traffic plan (OPA) system, including local traffic. The automated system for monitoring the implementation of the local transportation plan is interconnected with another automated system "Firm Station". There are several other automated control systems in this direction [14].

The formed information array gives an objective idea of the quality of service provided by the railway company to its customers. The accumulated information serves as the basis for a dialogue between the company and its customers on issues of further improvement of service quality. During the development and further improvement of data warehouses and the system for measuring the parameters of service quality, the task was to provide managers of the company "NS" with the possibility of prompt access to the information they are interested in. Daily and weekly reporting becomes the subject of discussion at meetings on operational issues. The problem of early detection of malfunctions and defects of the track and rolling stock is extremely important in terms of the quality of transport service, safety, and fuel economy. The company continues to make efforts aimed at timely detection of rolling stock malfunctions, for which floor sensors are widely used. The computer system for managing the car fleet receives data collected by devices that control the profile of wheels, the impact of the wheel on the rail, and other issues arising along the way [15].

As early as 1991, Norfolk Southern launched the Quality Excellence (TQM) program [15]. The program is aimed at maximum satisfaction of the needs and requests of the clientele, thus the improvement of service quality within the framework of this program should be ensured primarily by increasing the personal responsibility of employees and initiatives "from below". The key place in the program is occupied by two concepts: "flexibility" and "ingenuity". These qualities are necessary for success in a rapidly changing market environment. Thus, the full programmatic coverage of all activities of the Norfolk Southern company makes it possible to effectively manage the quality of work and, therefore, constantly increase the profitability of the company.

As an example, the quality management system of JSC "Ukrzaliznytsya" is the basis for organizing and improving technological and business processes. This system follows the requirements of the modern standard ISO 9001:2015 "Quality management systems. Requirements" [1] and includes: the policy reflected in the Regulation on the quality management system; the system of interrelated and complementary quality management processes; regulatory framework, which is a set of documents regulating the quality management system; an effective organizational mechanism, tools, and methods for implementing the requirements regulated by the company's regulatory framework.

The main directions of the Innovative Development Program of JSC "Ukrzaliznytsya" in the field of the Quality Management System are determined by the nature of the economic activity, considering the Development Strategy of JSC "Ukrzaliznytsya" until 2030 [16] and the

target Business model. The following areas of the Quality Management System in the service sector can be determined [7]: freight transportation (“Transport and logistics” business block); passenger transportation (business block “Passenger transportation”); quality of internal technological processes (business block “Railway transportation and infrastructure”); Quality management of product supplies for the needs of JSC “Ukrzaliznytsia”; certification of manufacturers of railway products for compliance with the requirements of IRIS (International Railway Industry Standard).

The content of measures for accounting and assessing the quality of transport services in the field of freight traffic in JSC “Ukrzaliznytsia” should be considered in more detail. The services of the “transport and logistics” business block are aimed at the qualitative achievement of key performance indicators for the innovative development of JSC “Ukrzaliznytsya”, namely, the level of customer satisfaction, fulfillment of quality standards in the field of transport and logistics services, the share of contracts in the field of transport and logistics services for which reasonable claims were made (excluding force majeure), the total number of contracts in the field of transport and

logistics services, specific number of traffic accidents and other events related to violation of train traffic safety.

The main criteria are the cost, the complexity of the services provided, their availability, information content about their composition and characteristics, the reliability of transport services, which in turn is determined by the timeliness of the consignment delivery, its safety, as well as the risk level of the consignor fulfilling contractual obligations of the carrier. The quality of transport services is influenced by the reputation of JSC “Ukrzaliznytsia” as a nationwide carrier of goods, ensuring the delivery of goods to any destination, including considering compatibility with other modes of transport in intermodal transportation [16]. Transport product quality management can be viewed as a comprehensive and coordinated assessment of the quality indicators of the transportation process and decision-making on the best (optimal) transport service for users based on existing quality standards for transport services and rail transport resources, considering the effective demand of the clientele. At the same time, it seems appropriate to expand the list of criteria for quality indicators that characterize the activities of transport companies from the standpoint of a systematic approach, as shown in Figure 1.

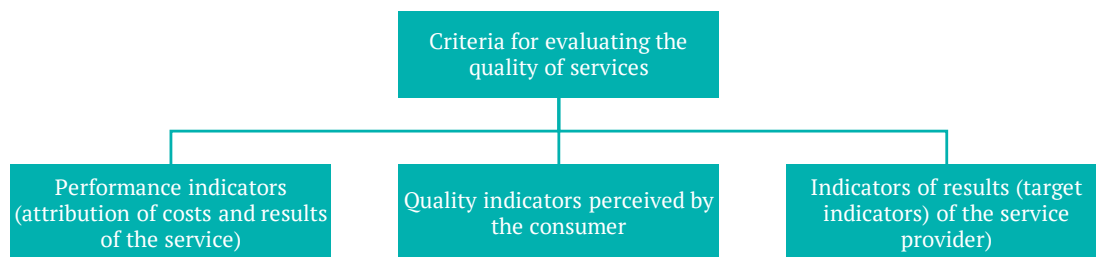


Figure 1. Criteria for indicators of transport product quality

Source: developed by the author

The whole variety of indicators (measurements) of the quality of transport products is proposed to be divided into three groups: the quality of technical means in transport; the quality of operational work of transport; quality of transport service for transport users.

The first two groups of indicators are focused on the third (main) group of final consumer assessments or indicators of the quality of transport service for users: the first two groups of indicators characterize the production quality of the internal processes for the implementation of the transport service, and the third – consumer quality of the transport service. The quality of transport services includes the entire range of transport services (cargo operations, registration of transportation documents, security and escort of cargo, additional information services, etc.), including the transportation process itself, movement of cargo [5]. At the same time, the cost (price) of transportation is an independent assessment indicator that is not included in the system of quality indicators but is an essential element in determining the competitiveness of transport products. Based on ongoing marketing research, transport companies can observe and analyse the dynamics of changes in the overall level of quality of transport services for cargo owners (Fig. 2).

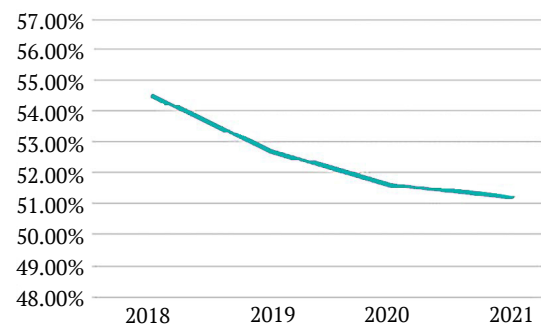


Figure 2. Dynamics of the average annual values of the service quality index of JSC “Ukrzaliznytsia” for the period from 2018 to 2021

Source: developed by the author

According to the presented dynamics, the value of the quality index, summarizing consumers’ evaluation of the level of service quality in the market of cargo transportation by mainline railway transport, changed ambiguously [19]: there has been a significant decrease in the overall level of quality (from 57 points in 2018 to 51 points in 2015), which is due to the “low base” effect (liquidation

of the inventory fleet of cars of JSC “Ukrzaliznytsya” and transfer of services for the provision of cars for transportation to operating companies).

Thus, it seems appropriate to refine the system of quality indicators to provide a systematic assessment of customer satisfaction in relation to the parameters of the operated technical means and implemented technological processes. In the future, JSC “Ukrzaliznytsya” also sees itself as a leader in the European transport and logistics market by providing high-quality and economically attractive services [19]. Therefore, the main growth factors that will allow the implementation of the strategy are as follows: increasing the attractiveness of freight and passenger transportation by rail transport in Ukraine; increasing presence in markets outside of Ukraine due to increased cooperation and direct investments; building an effective

logistics operator and increasing the share of logistics services in the company’s overall portfolio.

The business model of JSC “Ukrzaliznytsya” involves improving the corporate governance system and introducing corporate social responsibility, increasing investment attractiveness for stakeholders, as well as introducing the basic principles of steel development, which is based on safety principles that lead to improved technology for managing the quality of railway transport services. An equally important indicator of the effectiveness of strategy implementation will be an increase in labor productivity per employee and a decrease in the level of depreciation of fixed assets (Table 1). The results of the implementation of JSC “Ukrzaliznytsya” development strategy will be beneficial for all transport market participants: shippers, passengers, and the state (Table 2).

Table 1. A plan to increase labor productivity and reduce the level of depreciation of fixed assets

Indicator	Years		
	2019	2020	2021
Labor productivity, thousand UAH (per employee)	337	394	459
Depreciation level of fixed assets, %:			
ruts	50	49	49
freight electric locomotives	87	81	79
the number of freight wagons exceeding the operation terms	29	27	25

Source: developed by the author

Table 2. Potential benefits from the implementation of the development strategy of JSC Ukrzaliznytsia in the period 2020-2021

Participants of the market of transport services	Potential benefit
cargo	Satisfying demand for transportation, namely providing more than 90% of applications;
senders	Speed of transportation and fulfillment of delivery terms. Improvement of wagon circulation by 20% and cargo delivery speed by 15%;
passengers	Quality of rolling stock (more than 30% of wagons and mainline locomotives have been updated).

Source: developed by the author

Summarizing this information, it can be concluded that, in general, JSC “Ukrzaliznytsya” has sufficient quantitative equipment with an operating locomotive fleet. But most of them, namely approximately 84%, have already served their useful life. This is due to the fact that the main number of locomotives was built in 1960-1990, and the level of renewal of rolling stock has recently been quite low. A large-scale renewal of the locomotive fleet is currently not possible primarily due to insufficient financial stability of Ukraine. For the same reason, foreign manufacturers of locomotives, which have been planning to open their production in Ukraine for a long time, are also unable to reach an agreement with JSC “Ukrzaliznytsya”, because long-term agreements require stable financial support. In the context of the restructuring process at JSC “Ukrzaliznytsya”, the company’s management model emphasizes the importance of recognizing four key processes as the fundamental

elements for delivering high-quality passenger rail transportation services. These processes encompass infrastructure, traction services, passenger transportation, as well as auxiliary functions related to production and services. Based on the mentioned above, it can be concluded that the technologies for managing the quality of rail transport services should be improved using modern methods of studying public demand for transport services and further improving consumer qualities of transport services to make a profit, increase the social significance of rail transport and obtain competitive advantages.

The quality of services is a complex and diverse concept. Being an abstract category, it is difficult to define and accurately assess it. Quality is defined as the ability of a product or service to best meet people’s needs. Today, there are many ways to explain this concept and measure it. This is the result of a subjective approach to the assessment of

this phenomenon, as well as differences in criteria between producers and consumers. As a result, quality is defined as the conformity of the provided services with the expectations of customers or certain established standards. This is a complex concept that is constantly evolving and improving. In the light of global trends, the quality of railway transport must meet the needs and expectations of customers. Thus, the determination of the factors affecting the quality of service, as well as the basic standards that determine the quality characteristics of the services of the transport complex, are becoming more and more important. The system of service quality factors and criteria must be adaptive and flexible to meet changes in consumer demands and expectations and meet market requirements to ensure the industry's competitiveness in the European service market. This is due to rapid changes in the lives of modern consumers of transport services.

The analysis of research by R. Jancal [10], E. Vodovozov and O. Rudachenko [11], A. Bashan and S. Kordova [12] showed that the authors do not agree on the development of technology for managing the service quality of railway transport enterprises. Such algorithms can be the basis of a strategy for the development of innovations and investments in railway transport [20]. The author claims that this strategy will ensure the stability of the current state of railway transport enterprises and their ahead-of-the-line innovative and investment development. The study by M. Kuzhavsky [19] also considers railway transport as an important direction for the strategic development of the country. However service quality management is not fully considered. As a result, the peculiarity of this study is that the author's approach, which uses a conceptual scheme for determining the predictive values of service quality, based on economic and mathematical modeling, made it possible to predict the service quality management algorithm of railway transport enterprises and to develop measures aimed at improving this quality. M. Militaru [21] and S. Sahoo [22] investigated the relationship between quality management parameters and firm performance and identified the main obstacles to the implementation of quality management practices in production.

Investments in the industry are an important component of increasing the efficiency of quality management of railway transport enterprises. When diversifying the sources of investment of railway transport enterprises, priority should be given to Ukrainian investors in order to preserve national control and minimize the interference of foreign companies in the management of the sector. In this direction, the intervention and support of state authorities are critically important. In the future, this will contribute to the development of railway transport in Ukraine. There is no doubt that assessment and measurement occupy an important place in the issue of managing the service quality of railway transport enterprises. Transportation services, like many others, should be provided in the most cost-effective way. But now there are no sufficiently effective quantitative methods for objective assessment of the quality of some railway transport enterprises. In order to improve the efficiency of managing the service quality of enterprises in this industry, more attention should be paid to the problems related to ecology, as well as to the reduction of the harmful impact of railway transport on the environment.

The research has a practical aspect for the state, as it provides an opportunity to improve the quality management technologies of railway transport enterprises, to determine the projected investment volumes in the development of the country's regional development strategy, and to develop plans and recommendations for the development of railway transport enterprises. However, the improvement of railway companies' quality management technologies may lead to the problem of publishing data in official sources on time. Additionally, it should be remembered that the development of high-speed rail transport necessitates close coordination with the European Railway Agency, which oversees rail transport activity in Europe, to bridge the gap between Ukrainian railways and the technologically advanced railways of Europe on the path to Ukraine's integration into the European Union.

● CONCLUSIONS

To guarantee the quality of railway transport, passengers must be the first priority for enterprises when developing a plan for assuring the quality of transportation and logistics services. That is, JSC "Ukrzaliznytsia" should first have a thorough understanding of passengers' needs before offering solutions to meet them. The recommended solutions are then assessed and contrasted in accordance with the degree of advantages in the next stage.

The provision of transportation services to passengers is based on a variety of business processes related to both the direct transportation of passengers and the process of ensuring the effective operation of the entire railway infrastructure. Four processes – infrastructure processes, traction service processes, passenger transportation processes, as well as auxiliary processes (production and service) – should be recognized as the foundation for high-quality passenger rail transportation services, according to the business model of company management developed during the restructuring process of JSC "Ukrzaliznytsia".

Transportation technology development, the coordination of actions of various departments in the railway transportation service, operational control of transportation quality, operational corrective, and preventive actions, as well as marketing, are all related to infrastructure processes. The construction of high-quality passenger services is connected to passenger transportation operations and is based on intelligent transport service systems.

The maintenance of the railway infrastructure, the technical conformity of the rolling stock to the transportation needs, and material and technical supply are examples of auxiliary processes. Taking into account everything mentioned above, the primary objectives of quality management include: systematically matching the level of transportation quality to the current and anticipated market needs, as well as exerting deliberate influence on growing needs; ensuring the competitiveness of railway transportation on the Ukrainian and international markets of transport services; defining objectives for enhancing the current transportation services and developing new types of related services; discouraging the use of unsafe or substandard services. The development of a methodical approach to assessing the level of service management of railway transport enterprises of Ukraine is the subject of further research.

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Технології управління якістю послуг залізничного транспорту

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Анотація. Актуальність теми дослідження зумовлена кризовими явищами, котрі відбуваються у розвитку транспортної галузі України, які зумовлені як загостренням внутрішніх суперечностей у розвитку суб'єктів цієї сфери, так і впливом зовнішніх негативних факторів, пов'язаних з економічною та політичною кризою в країні. Метою роботи було визначення проблем управління якістю послуг, що надаються на залізничному транспорті. Визначено особливості сучасних транспортних послуг, порушено питання ефективної підготовки персоналу в умовах використання передових технологій навчання, надано характеристику надання послуг акціонерного товариства «Укрзалізниця». На основі економіко-математичних моделей доведено, що динаміка прибутку підприємств залізничного транспорту значною мірою залежить не лише від його техніко-технологічних можливостей, а й від соціально-економічних чинників щодо потреби та можливості використання технологій управління якістю послуг. Встановлено, що наявність вищевказаних розбіжностей і проблем суттєво впливає на рівень технології управління якістю послуг підприємств цієї галузі. Зроблено висновок про необхідність підвищення ефективності технології управління якістю послуг підприємств залізничного транспорту на основі використання сучасних підходів до всебічного вивчення запитів споживачів та подальшого підвищення споживчих якостей транспортних послуг з метою формування прибутку, підвищення соціальної значущості залізничного транспорту та отримання конкурентних переваг у майбутньому. Результати дослідження можуть бути використані для розробки державної стратегії регіонального розвитку, а також окремо для розробки планів і рекомендацій щодо розвитку підприємств залізничного транспорту на різних рівнях управління

Ключові слова: підприємства, залізнична галузь, стандарт, прогнозування, менеджмент