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# METHODICAL FOUNDATIONS OF QUALITY MANAGEMENT OF RAILWAY TRANSPORT ENTERPRISES

## ABSTRACT

The article deals with the methodical foundations of quality management of railway transport services. Currently, the transport industry of Ukraine is going through extremely difficult times. This is due to the strengthening of internal conflicts regarding the development of enterprises in the industry, as well as negative external factors related to economic and political activities and a national disaster. Quality management at railway transport enterprises involves the creation of quality management systems and measures necessary for their effective functioning. It is noted that the profit dynamics of railway transport enterprises largely depend on socio-economic factors regarding the needs and possibilities of using high-quality transport services, as well as on technical and technological possibilities. As a result, the main disagreements and problems that led to customer dissatisfaction with rail transport services were revealed.

As a result, it was found that the presence of the above discrepancies and problems has a significant impact on the level of quality management of services provided by railway companies. At the current stage of the integration of the railway industry of Ukraine into the EU transport system, it is necessary to clearly understand the problems that arise in the process. Only then it will be possible to resolve the discrepancies between consumer expectations and the actual quality of services they receive. As a result, it was concluded that management of the quality of services of railway transport enterprises should be more effective, using modern methods of comprehensive study of consumer needs and further improvement of the quality of consumer services. This is done to make a profit, increase the social significance of railway transport and gain competitive advantages in the future.

**Keywords:** quality of services, management technology, railway transport, management, transport service

**JEL Classification:** L15, L92, M11

## INTRODUCTION

Thanks to the restructuring of JSC "Ukrzaliznytsia" and the selection of individual companies within it by the main areas of activity, the railway transportation industry of Ukraine is currently going through a difficult period. These changes led to the creation of a competitive rail market, which led to the emergence of private operators. Although the railway reforms are generally good, it should be noted that they have lasted for more than ten years and have led to a deepening of the crisis of railway enterprises and increased their vulnerability to external threats affecting their activities.

Railway transport needs to discover measures to keep up the stability of its development and boost its competitiveness against other private operators, as the market becomes more and more unpredictable. Using a widely accepted technology like service quality management at railway companies makes sense, given the strategic nature of the issues pertaining to the operation of railway transport operations. Considering shifting business conditions, incorporating the latter into the operations of railway transport companies would help them avoid potential crises and maintain their long-term viability.

In the context of globalization, the development and certification of a quality management system that satisfies the criteria of international standards like ISO 9001:2015 "Quality management systems" are significant concerns for railway transport.

The railway sector may consistently enhance working conditions, productivity, and product quality while maintaining a competitive edge and market advantage when it implements a quality management system. Railroad transportation with a global quality management system certification according to the ISO series standards has less risk because its activities and internal structure are regulated, which makes the system transparent. In addition, the management system is regularly checked by an independent organization that has certified the quality management system. The standard ISO 9001:2015 is client-, process- and risk-oriented. Identifying and managing many interrelated processes is vital for the rail industry to operate efficiently. The principle of quality reflection in the theory of quality management involves transferring (reflecting) the quality of the process to the quality of the result. According to this principle, it is expedient and effective to influence the quality of the result, that is, the finished product, by influencing the processes that form the result itself.

## LITERATURE REVIEW

Modern concerns regarding regulating the calibre of services provided by train transport businesses have long been seriously considered by both scholars and practitioners. Notable contributions were made by A. Dikan [2], V. Zubenko [3], N. Kalicheva [4], A. Pasechnik [5], Ja. Panchyshyn [6], and others.

New strategies for managing our country's transportation infrastructure are required considering current globalization processes and Ukraine's entrance into the world economy. Rail transportation has always played a crucial role and continues to do so in Ukraine since it has one of the largest rail networks in Europe and enormous transit possibilities.

Sadly, industrial organizations' inability to adjust to shifting transportation requirements is what leads to the poor quality of services supplied by railway transport companies today.

A greater comprehension of the economic theory that underpins both quality management theory and practice must serve as the foundation for this category's description. Thus, according to Aristotle, "good-bad" or "difference between objects" distinctions are what determines quality [7].

"Quality" is described by J. Harrington [8] as "meeting or exceeding the consumer's requirements at a price he can afford."

In accordance with the worldwide quality management standard ISO 9000-2000, "quality is a set of properties and characteristics of a product or service that allow it to satisfy the specified or expected needs of consumers" [9].

For example, S. Vesperis states that "compliance of the services provided with the expected or established standards" [10] is what he means by "service quality." According to G. Kucheruk, the quality of a service should be defined as a "set of properties and characteristics of a service, the level of which is formed by the relationships of all interested parties and makes it possible to satisfy constantly changing different levels of needs" [11].

V. Makhovka and V. Vyshovskyi propose to consider the quality management system as a kind of management tool that allows enterprises to improve their activities and product quality. The authors claim that the product quality management system at the enterprise should consist of several interconnected subsystems, which aim to ensure the corresponding requirements for the level of product quality [12].

The service quality management system, according to M. Ridenko, is a collection of concepts, organizational structures, techniques, and incentives with the goal of establishing, preserving, and, if required, enhancing the quality of services [13]. Planning, forecasting, and economic-mathematical modelling of railway enterprise activity processes are among the concepts that I. Klymenko developed, along with methodological provisions and a theoretical-methodical approach to the classification of quality management processes [14].

However, there are a few issues that have not been fully explored and need more research. These issues relate to the theoretical and methodical underpinnings of the field as well as the identification of scientific and methodical approaches to managing the quality of services offered by railway transport corporations.

## AIMS AND OBJECTIVES

The aim of the study is to present a methodical approach to assessing the effectiveness of the system of interaction of railway transport enterprises to improve the quality of service, as well as to determine the problems and opportunities for the development of the system of managing the quality of railway transport services in modern economic conditions.

Implementation of the set aims determined the need to solve the following tasks:

- to analyze the main criteria of service quality management;
- to form a generalized structure of the system of quality indicators of the service of railway transport enterprises;
- to present a methodical approach to assessing the effectiveness of the system of interaction of railway transport enterprises to improve the quality of service.

## METHODS

The research methodology includes methods and forms of scientific knowledge accepted in science, such as analysis and synthesis - when investigating the essence of product quality; static grouping and comparison - when analyzing the activity of railway transport; economic-mathematical modelling - when developing a model of the relationship of quality indicators characterizing the results of the enterprise; graphic - for visual illustration of the phenomena, processes and regularities under investigation. The theoretical basis of the study was laid by the works of Ukrainians and other specialists. In addition, the study includes the methodology of prognostic assessment of trends in the development of service quality management technology in the conditions of the formation of a high-tech environment.

## RESULTS

For a very long time, domestic railway enterprises worked without considering the needs of the market, both in the country's economy and in the transport industry. In addition, modern market conditions create new requirements for the quality of services. In addition, the sustainable and efficient operation of railway transport is crucial for ensuring the defence capability, national security, and integrity of the state, as well as improving people's living standards. Thus, it is necessary to make drastic changes to improve the railway transport management system, and the state should support this reform [8].

Meeting the needs of customers is closely related to the provision of high-quality services. This interaction forms the market policy of any business. Business development in the market directly depends on the results of quality management. Thus, railway companies must organize service quality management, which includes quality control, planning, assurance, improvement and development of quality policies and objectives.

Vesperis S. Z. argue that managing the quality of services means using the potential of management, economy and production that exists to meet the needs of customers under the condition of obtaining benefits for the entity that provides it, for its own economic development [10].

Developing policies and objectives for planning, ensuring, and improving quality is part of service quality management.

Increasing customer satisfaction is undoubtedly the primary goal of quality management. In general, many criteria determine the level of service quality management.

Of course, everyone involved in the process should benefit and be satisfied if it is conducted at a high level of management (Table 1).

<b>Criterion</b>	<b>The essence</b>
The possibility of receiving	Unlimited consumer access to services
Accessibility	Correspondence of quality and price
Compliance with a certain level	Respectability of service provision, skill and experience in service provision
Professional delivery	The possibility of providing the service in the required volume at the required time
Convenience	High level of service, making the consumer confident that the necessary service will be provided in full
Timeliness	Punctuality in terms of service provision

Today, rail transport companies face several problems, mostly related to the lack of transparency in the financing of this industry, which provides links and connections between different industries, businesses, regions and on which the quality of life of society depends. Railway transport has a high wear and tear of fixed assets, which affects the quality of service

and the competitiveness of companies. The operation of physically outdated rolling stock also led to an increase in the cost of vehicle repairs and a decrease in the quality and reliability of transportation.

Currently, JSC "Ukrzaliznytsia" manages the railway infrastructure and is the only national carrier of both cargo and passengers.

However, the Ministry of Infrastructure of Ukraine claims that the reform of JSC "Ukrzaliznytsia" should be completed immediately to make it more transparent and create a vertically integrated management system that will meet EU standards [16].

For railway transport enterprises, the service quality management system consists of these main components [15]:

- the level of the concept of services, taking into account which the relevant infrastructure is created and the organization of service provision is created;
- the level of infrastructure that is available to realize the possibility of providing services;
- the level of service (the provision of a specific service to a specific customer directly) includes the processes of service provision, information collection, and management and control;
- prevention of potential conflicts between different types of activities;
- a clear focus on achieving the goals of the enterprise and effective management decisions that take into account the interests of interested parties;
- attraction of more loyal customers;
- increase the enterprise's reputation and strengthen its competitiveness in the market.

Resolving issues pertaining to raising the calibre of services provided by railroad transportation companies requires a substantial influx of capital. The technical and technological level of domestic railway transport does not match European norms due to a lack of these resources.

However, there are several general barriers that prevent railway transport from operating steadily. These include inadequate funding for the simple and extended reproduction of fixed assets (infrastructure and rolling stock); almost no government spending on socially significant passenger transportation; and support for the practice of shifting implementation costs to rail transport [17].

To achieve the goals of increasing the efficiency of railway transport and the quality of the services provided, it is necessary to implement legally established conditions that will encourage investment in transport infrastructure projects in Ukraine and abroad, increase the investment attractiveness of railway transport and create conditions for the development of the industry.

Personnel is another important part of managing the quality of rail transport services.

Enterprise teams are not encouraged to perform any work other than their official duties. As noted earlier, the initiative is not supported by management, which sees itself as only a generator of ideas and sees everyone else as mere executors. It is necessary to pay attention to the fact that employees need innovative ideas, as well as desire and encouragement because they are overloaded with current tasks [18].

Since the specificity of railway transport requires special requirements for personnel, the presence of highly qualified managers is necessary to improve the quality of services provided by the enterprises. Given the importance of this industry, it is necessary to conduct a competitive search for young talent so that enterprises can choose employees from many applicants. People who are responsible for the quality of services in railway transport must be competent, that is, have appropriate education, professional training, experience, and qualifications.

During the recruitment process, the enterprise's management must consider changes caused by both external and internal factors; working conditions and nature of enterprise processes; stages of employee qualification improvement; and enterprise culture.

The strategy aims to draw in highly skilled workers capable of finding innovative solutions to pressing issues and bringing about significant transformations in the development of a cutting-edge service quality management system for railway transport companies and the Ukrainian transport sector at large.

Managing the quality of rail transport services involves establishing a legal basis for all standards, regulations, and certification procedures to meet customer requirements and to distinguish characteristics that satisfy needs from those that expect a certain level of quality.

Railway transport firms' ability to effectively control the quality of their services is impacted by both internal and external environmental variables.

Internal factors include material and technical, socio-economic, informational, managerial, marketing, and human resources. External factors include political, institutional, economic, scientific and technical, social and globalization factors. Railway transport enterprises that use a quality management system receive a number of advantages, the main ones of which are:

- a clear focus on achieving the strategic goals of one's own activities, taking into account the interests of each group of stakeholders;
- strengthen competitiveness in the market of transport services;
- reasonable and effective use of all available resources;
- resolution of certain contradictions between different types of activities;
- improvement of the organization's management structure and distribution of powers regarding quality management;
- development of a complex documentation management system;
- new prospects for customer loyalty management;
- reputation improvement, etc. [13].

The ability to satisfy the needs of customers is the most important characteristic of rail transport services. On the other hand, it is ambiguous and contradictory, since the transport service has certain features, which are subject to corresponding requirements. The quality of the transport service, on the other hand, is defined as a combination of positive and negative elements that manifest themselves depending on specific circumstances.

Undoubtedly, evaluation and measurement of quality occupy the most important place in solving the problem of effective management of service quality. Therefore, the solution to this problem depends primarily on the consideration of the "quality of services" provided by the manufacturer and the consumer. For this reason, the assessment of the consumer's quality level has priority over the assessment from a technical point of view (compliance with technical standards, tasks, and conditions).

The approach will allow you to respond quickly to the needs of customers, analyzing their needs and identifying methods of continuous improvement of the quality of services, which gives competitive advantages.

The quality management mechanism involves the execution of cyclical actions:

- formation of the structure and list of quality indicators;
- establishing standards for these indicators;
- assessment of the level of achievement of standards;
- determination and diagnosis of the causes of backlog;
- development and implementation of management influences on quality adjustment (including staff incentives for quality), as well as periodic clarification and updating of the composition of quality indicators and their standards.

The periodicity of forming the list of indicators and their normative values is due to the need to ensure their compliance with legislative and regulatory acts and the growing demands of passengers. Evaluating the quality of railway services is characterized by the lack of orientation of the final consumer of the transport service - the passenger, who is the main consumer of the service. However, it is the passenger who can evaluate the service regardless of the quantitative indicators set by the suppliers, but only based on the obtained result.

The modern trend in assessing the quality of public transport services is aimed at accounting for intangible criteria that are subjectively assessed by the passenger. At the same time, the criteria for evaluating the quality of railway services must include indicators that are clearly understood and perceived by the end user, and these indicators must be inseparable from the service as such. In other words, considering the perception of the quality of railway services from the passenger's point of view, a positive or negative quality assessment consists of the extent to which the received service meets the passenger's expectations. The expression of satisfaction or dissatisfaction with the quality of the service provided can be quantified using a given scale with extreme values corresponding to the expressions "not at all satisfied" and "completely satisfied". It should be noted that such information does not allow to fully assess the performance of public transport service providers if each of them will be guided by different quality criteria and target values of indicators. Therefore, the assessment of consumer satisfaction with the quality of the provided service must be compared either with predetermined parameters or with the results of previous similar studies. Analysis of the EU standard [9] showed that the key elements

of the transport service quality assessment methodology are the "quality loop", which is based on the ratio of criteria: "expected quality level", "achieved quality level", "perceived quality level" and "target quality level". Here, the "achieved level of quality" on the part of the organization providing railway services is reflected through an indicator formed by passengers, the "perceived level of quality". The "achieved quality level" indicator is not just a technical assessment of the completion of the service provision process, but also what the consumer felt at the time-of-service provision. In turn, the measurement of the "expected level of quality" of passengers determines the "target level of quality" for the organization providing transport services.

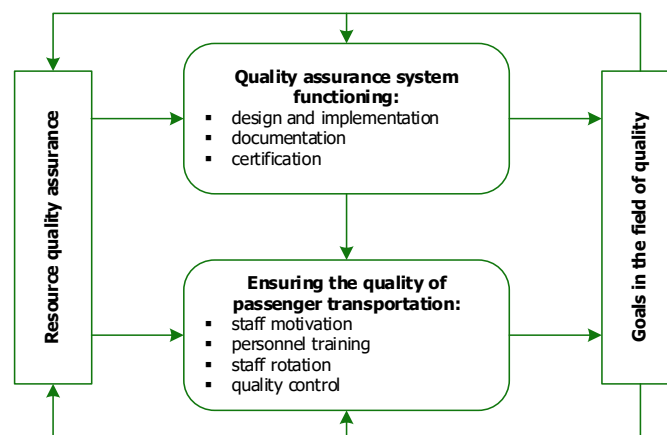
The disadvantages of this method are a certain subjectivity and the need for a careful approach to the measurement methodology, for example, a certain stratification of consumers, methods of constructing questionnaires, etc., which allows considering, including, the needs of potential passengers (these aspects are presented in detail in the methodology of qualitative and quantitative research). In turn, the difference between the "expected quality level" and "perceived quality level" indicators can be considered the level of passenger satisfaction and serve as an indicator for evaluating the quality of the transport service system.

The assessment of the quality of railway services cannot be based only on subjective assessments of quality indicators measured by the survey method and must include objective quantitative indicators, particularly those indicators that are established as mandatory by Ukrainian legislation and technical regulation norms. Such indicators are usually adequately perceived by railway service providers, as they have a standard wording, a unit of measurement, are well controlled and cannot be interpreted in a double manner when drawing up contractual documents.

Given a certain conflict of interest between what the consumer of the service wants to receive and what the provider is ready to provide (in terms of capabilities, costs, planning), most parameters in the assessment of service quality should have two measurement scales.

On the one hand, objective parameters measured in hours and kilometres can be set, and on the other hand, each parameter is given a value that reflects the consumer's satisfaction with this parameter. For example, the intensity of traffic on a given route affects the time spent waiting to board a vehicle. This information is contained in the traffic schedule and is the basis for the consumer to decide regarding the choice of time and method of movement. The service provider undertakes the obligation to fulfil and maintain the set traffic interval. Accordingly, the fulfilment of this obligation must be monitored. The consumer's perception of the specified movement interval can be both positive and negative, and even if the service provider complies with the specified value of the parameter, the consumer may not be satisfied. This means that the given value does not meet the consumer's requests and requires adjustment. Thus, the parameters given in the example will have both an objective value and a subjective value obtained by researching consumer satisfaction.

The study of general approaches to the assessment of the quality of transport services, the principles of determining quality indicators in Ukrainian and foreign studies, standards made it possible to form a generalized structure of the system of quality indicators of the service of railway transport enterprises (Figure 1).



**Figure 1. Structure of the quality indicator system of railway transport enterprises.**

A distinctive feature of this structure is the decomposition of the properties (characteristics) of the railway service and their transformation into quality indicators that take into account both functional and instrumental properties of the control object, taking into account the points of contact of the passenger in the process of receiving the service and in the

correlation of these indicators with the organizations responsible for their implementation in accordance with current legislation.

Consumers of railway services can be divided according to areas of activity:

- cargo transportation: global manufacturers, domestic manufacturers, private logistics operators;
- passenger transportation: domestic, transit, international transportation.

Today, five main disagreements and problems can be identified, which are the reasons for consumer dissatisfaction with the services of railway transport enterprises (Table 2).

**Table 2. Discrepancies in expectations and problems arising from them in the process of providing services by railway transport enterprises.**

Discrepancies in expectations	Problems
Between the provided services and external information about their level	Inconsistency between the promised level of service quality and its actual state
Between quality standards and existing quality levels	Failure to comply with the rules of service by the enterprise's personnel
Between the expectations of consumers and their perception by the management and management of the enterprise	Absence or unreliability of information about consumer expectations
Between the perception of the leadership and management of enterprises of consumer expectations and the insufficiently fast transformation of this perception into quality standards	Lack of modern customer service standards
Between consumer expectations and their perception, which is essentially a summary of previous disagreements	Dissatisfaction of consumers with the quality-of-service provision

The degree of quality management of services provided by railway transport firms is greatly impacted by the existence of these disparities and issues. Only when the issues inherent in this process are clearly understood at this point in the integration of the Ukrainian railway sector into the European transportation system can the disparities between consumer expectations and perceptions of the quality of services provided be eliminated.

The interaction of railway transport companies is, in practice, a multi-agent network in which each subject has its own goals of cooperation with other subjects. However, the goal of the operation and development of the entire network is to stimulate growth in the quality of transport services. Therefore, it is necessary to identify a set of key performance indicators for the system of interaction between transport companies, which will sufficiently reliably reflect the achievement of the goals of improving the quality of service. In this case, it would be optimal to use not a normative approach to establishing targets for the achieved level of quality (clear and specific goal setting), but an indicative approach (the boundaries of the acceptable minimum and the achievable maximum of the goal).

A methodical approach to assessing the effectiveness of the system of interaction between transport companies to improve the quality of service is based on the use of a minimax target approach and assumes that each component that forms the interaction platform of these companies must have its own key performance indicator. Considering that the platform in the interaction system is formed by four components, it is optimal to highlight four key performance indicators with the establishment of minimum (no more than 10%) and maximum (no more than 5%) target values for quality of service. The definition of the deviation scale is based on the interpretation of the value of the coefficient of variation. According to the scale of gradation of risk by the coefficient of variation, precisely at a value that does not exceed 10%, the risk is weak. The authors chose an interval corresponding to half of the indicated interval (5%) (Table 3).

**Table 3. Methodical approach to assessing the effectiveness of the system of interaction between railway transport companies to improve the quality of service.**

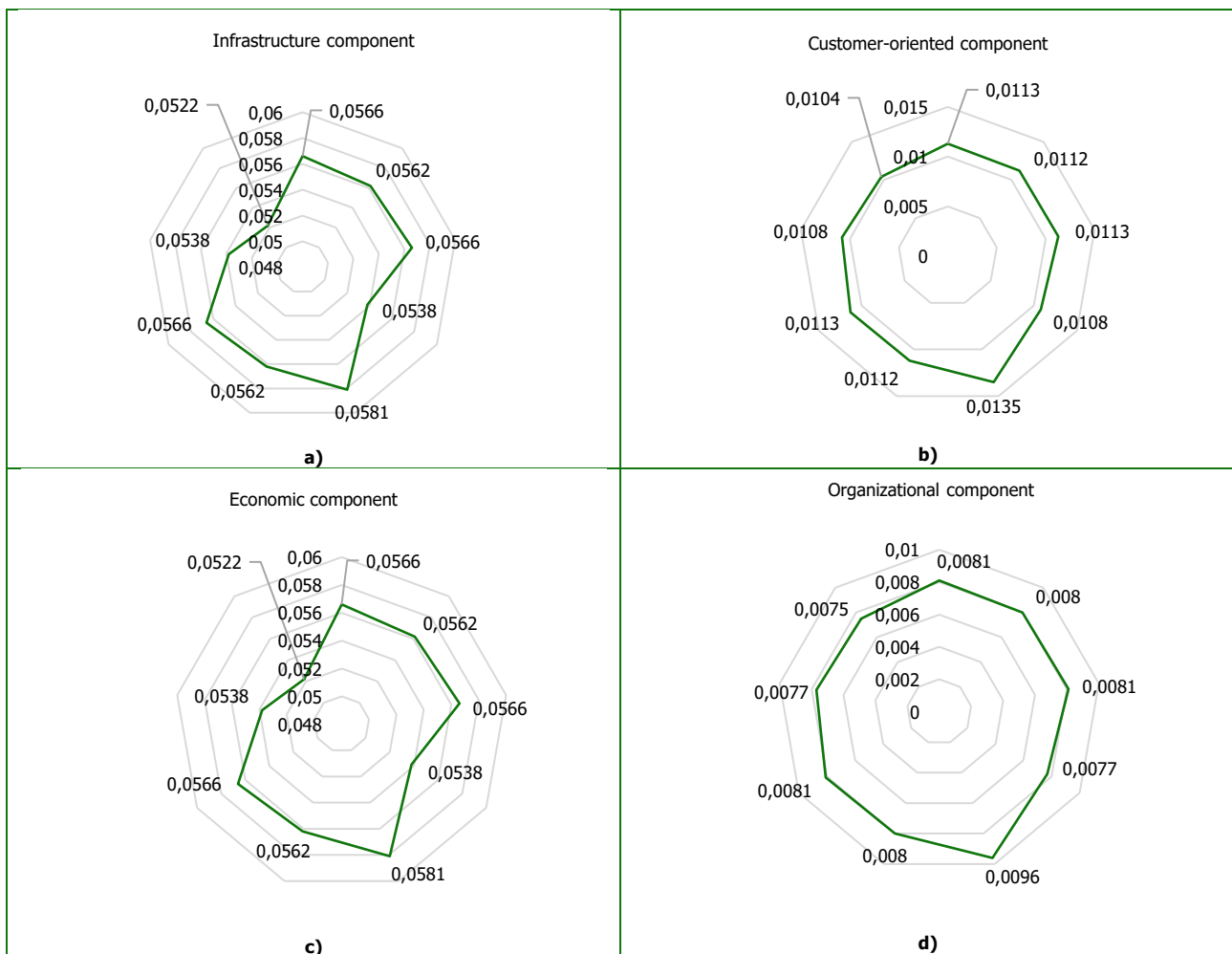
Component	Calculation method		Target values for quality of service	
			Minimum	Maximum
Infrastructure component: efficiency of the transportation process	$IC = MCA/MCF$	MCA and MCF – permissible and actual time, respectively movement	Not higher than the normalized permissible value	Within the optimal value
Customer-oriented component: receipt of complaints regarding the quality of service	$COC = R / \sum UM$	R – amount of complaints received from customers $\sum UM$ – total cost of completed orders by transportation	No more than 10% of the total number of carriers	No more than 5% of the total number of passengers
Economic component: cost of transport services	$EC = \sum ET_n / \sum ET_{n-1}$	$\sum ET_n$ и $\sum ET_{n-1}$ – total transaction costs of the current and previous periods	At the level of the agreed tariff	Planned tariff reduction
Organizational component: optimization of errors in document flow and information support	$OC = Er / \sum UM$	Er – number of violations of the service process technology. $\sum UM$ – total number of completed orders (units)	No more than 10% of the total quantity transported units	Not higher than 5% of the total number of passenger units

Considering the above, the obtained results of the evaluation of the effectiveness of the system of interaction of railway transport enterprises in terms of improving the quality of service are shown in Table 4.

**Table 4. The results of determining the weighting coefficients for evaluating the effectiveness of the system of interaction of railway transport enterprises in terms of improving the quality of service, resp. unit.**

Indicators	The average value of the results of expert evaluations	Standardized value of service quality indicators
Infrastructure component	0,048	0,06
Customer-oriented component	0,0104	0,0135
Economic component	0,0522	0,0581
Organizational component	0,002	0,0096

The visualization of the obtained results of determining the weighting coefficients for the evaluation indicators of the evaluation of the effectiveness of the system of interaction of railway transport enterprises to improve the quality of service is presented on the corresponding radars (Figure 2 (a, b, c, d)).



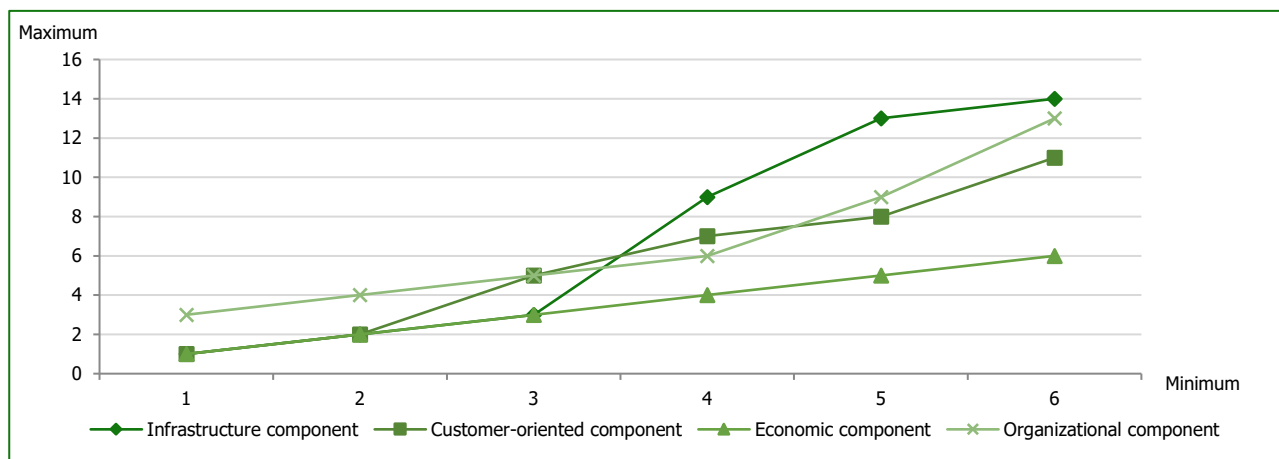
**Figure 2. Radars of the results of the evaluation of the effectiveness of the system of interaction of railway transport enterprises in 2022.**

To calculate the level of achievement of the goal of quality of transport services for cargo owners, it is proposed to use the following formula:

$$CQ = (P_i - P_{max}) / (P_{max} - P_{min}) \quad (1)$$

$CQ$  – the level of achievement of the target result characterizing the quality of transport services;  $P_i$  – the current value of the  $i$  key performance indicator, which determines the quality of transport services;  $P_{max}$  and  $P_{min}$  – accordingly, the maximum possible and minimum acceptable value of the  $i$  key performance indicator.

The value of the level of achievement of the target result characterizing the quality of transport services of railway transport can vary in the range (normally) from the minimum negative to the maximum positive value. In this case, achieving the maximum possible target level is characterized by a zero value (Figure 3).



**Figure 3. The value of the level of achievement of the target result characterising the quality of transport services of railway transport in 2022.**

The value of the level of achievement of the target result characterizing the quality of transport services of railway transport can vary in the range (normally) from the minimum negative to the maximum positive value. In this case, achieving the maximum possible target level is characterized by a zero value.

And, according to the logic of the presented formula, the movement of the indicator towards the minimum acceptable target level is characterized by a negative value. Accordingly, going beyond the maximum set target level is always characterized by any positive value, and going beyond the minimum permissible level is always characterized by any negative number. Consequently, the increase in the level of achievement of the target result, which characterizes the quality of transport services for railway transport, will tend to one.

Thus, the obtained numerical actual value of one or another key performance indicator allows us to quickly assess the deviation of the current level from the established target indicator characterizing the quality of service of railway transport companies. This, in turn, makes it possible to identify the presence of hidden problems in the interaction of these companies and make/implement the necessary decisions to ensure the preservation of not only the effectiveness of this interaction but also the quality of railway transport based on a customer-oriented strategy.

The methodology for determining the level of passenger satisfaction and the current methods of evaluating technical indicators of quality, as well as a set of indicators used for evaluation, are significant for ensuring the quality of railway services. As shown above, research conducted under the auspices of the Transport Research Committee (USA) and the Committee for Standardization (EU) made it possible to develop a system of indicator groups: service availability, service reliability, comfort, security, pricing, information, customer service work, environmental aspects services.

In turn, in the regulatory documents of Ukraine, there is a similar system of groups of indicators: availability for receiving the service, reliability of service provision (level of technological organization of rolling stock on the route and time spent on movement), trip safety, information support, comfort.

The structure of indicators for evaluating the quality of transport services, therefore, we can talk about a certain consensus between the approaches of different countries in this matter. At the same time, it should be noted that the selected elements are groups of criteria that should be included in the criteria of the first level. Further detailing of the criteria at the second and third levels may have significant differences related to the peculiarities of the perception and expectations of passengers. The EU standard lists the criteria of the first, second and third levels, built on the principles of detailing "points of contact". Any activity of the system is carried out in accordance with established principles.

According to the Transport Strategy of Ukraine for 2030, the following principles have been established for the transport policy of the country:

- sensitivity to the needs of transport users;
- efficiency and effectiveness of cargo and passenger transportation systems;
- increasing safety and reliability;
- sustainable development of transport;
- adequate and reliable financing of the transport sector;
- sustainable urban mobility, economic and social integration [12].

All the above principles should ensure the integration of railway transport in Ukraine into the single transport space of the EU, increase the level of service quality, and strengthen the economic potential of industry enterprises.

The criteria for assessing the quality of services by consumers are mostly abstract and intangible, which complicates the process of their identification and definition. Also, when evaluating quality criteria, it should be considered that the same service quality criterion can be perceived by consumers in different ways, depending on its value for a specific group of consumers and their expectations from this service [16].

Consumer expectations of the client of transport services are based on the following parameters [17]:

- language communications (rumours), information about services that consumers of services pass on to each other;
- own needs (the client's own ideas about quality, his requests);
- past experience, similar services provided to him in the past;
- external communications received through mass media: radio, television, press.

Today, the main requirements of consumers of transport services for the service are timeliness, reliability, safety of luggage, traffic safety, condition of rolling stock, interaction with other types of transport, electronic document flow.

In general, the study of the efficiency of services includes determining the level of efficiency, identifying the causes and factors determining this level, studying opportunities and reserves, as well as ways and means of increasing efficiency by improving their quality in one way or another. In turn, the transition from evaluating the effectiveness of service quality improvement or deterioration is based on the methods of its evaluation. Among the main criteria for the quality of service of railway transport enterprises, the following can be distinguished:

1. Safety (depends on the technical condition of rolling stock and personnel qualifications).
2. Reliability (depends on the level of organization of the provision of transport services, the existing management system and environmental factors).
3. Comfort (depends on the technical condition of the rolling stock, the level of service and the qualifications of the staff).
4. The level of payment for the service (depends on external factors and the enterprise's financial policy).
5. Information support (depends on the level of development of information and communication technologies at the enterprise).
6. Staff qualifications (training, retraining, compliance with European quality standards).

Increasing the efficiency of service quality management of railway transport enterprises of Ukraine critically depends on the restructuring and renewal of fixed assets, improvement of transportation technology and improvement of the quality of transport services in accordance with market requirements and European and world quality standards in the industry.

According to the authors, the following are the main directions for improving the efficiency of service quality management of railway transport enterprises today:

- formation and implementation of a modern strategy for the quality of cargo and passenger transportation services, which is based on compliance with EU standards and is based on the principles of synergy;
- formation of clear requirements for the quality of services of railway transport enterprises in the transportation of passengers and cargo based on the implementation of global quality standards;

- support of the process of improving the management of the quality of services of railway transport enterprises by the state (adopting relevant legislative acts, creating coordination committees, attracting sufficient investments, increasing the responsibility of the top management of economic entities);
- reconstruction of the infrastructure of railway transport enterprises and modernization of rolling stock in order to ensure the quality and reliability of the services provided;
- implementation of scientific developments in technological processes and the process of management of railway transport enterprises;
- effective information provision of passenger transport, which will ensure access of users of transport services to information at all stages of its implementation;
- provision of effective feedback between the consumer and the provider of transport services;
- systematic training of highly qualified specialists;
- development of an effective and independent system of control over the quality of services of railway transport enterprises.

A very important aspect of increasing the efficiency of quality management of railway transport enterprises is the attraction of investments in the industry. Thus, in the Transport Strategy of Ukraine for 2030, in the long term, it is envisaged to introduce a competitive rail transport market, to attract private businesses to work on the market, as a result - to increase investments in the industry [15].

## DISCUSSION

The introduction of an appropriate policy aimed at providing the industry with investment resources for the purpose of its comprehensive development is necessary to solve the problems faced by railway enterprises.

In our opinion, when diversifying sources of investment in railway transport enterprises, priority should be given to domestic investors to preserve national control and minimize the interference of foreign companies in the management of the industry. 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 our country.

Undoubtedly, the issues of assessment and evaluation occupy an important place in the issue of managing the quality of services of railway transport enterprises. Transportation services, like many others, usually must save money as much as possible to meet all the needs of the customer. However, now there are no sufficiently effective quantitative methods of objective assessment of the quality of individual aspects of the activity of railway transport enterprises.

It is worth agreeing with M. Rudenko, who, while considering the interests of railroad companies, created a method for managing the quality of passenger transport services with the goal of satisfying customers' expectations from the transport process. The conceptual concepts that underpin this system are the goal, task, topic, object, principles, functions, and useful suggestions. These principles, in turn, provide the general relationships between the key components involved in controlling the quality of passenger transport services in railway transport [21].

V. Ovchynnikova and M. Skosareva in their work considered the conceptual provisions of the formation of the railway transport quality management system, which was proposed to be based on a process approach [22].

To improve the efficiency of the management of the quality of services of enterprises in this field, 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.

Effective regulation is necessary for the creation and development of a quality management system for railway transport enterprises. The main areas of regulation are the creation of a balanced rail transportation market; coordination of railway transport infrastructure development plans; ensuring technological and environmental safety of railway transport; promotion of international activities.

At the same time, some important theoretical and practical aspects of quality assurance and improvement of railway transport quality management processes, considering the peculiarities of their operation, have not yet received adequate coverage. Methodological bases for determining and implementing reserves for improving the quality of railway transport remain insufficiently developed, approaches to personnel management of enterprises need to be improved, taking into account the principles of quality.

## CONCLUSIONS

The study demonstrated how the calibre of services provided by railroad transport companies affects both national security and the sustainability of Ukraine's whole national economic complex. In addition to defining the challenges and prospects for the advancement of the quality management system of railway transport services under contemporary economic circumstances, a methodical approach to evaluating the efficiency of the system of interaction of railway transport enterprises to improve the quality of service is presented. Analysis is done on the primary standards of service quality management. The set of service quality indicators for railway transport firms was organized into a standardized framework based on the use of a minimax target approach and assumes that each component that forms the interaction platform of these companies must have its own key performance indicator.

It turned out that solving the problems of quality management of railway transport enterprises will ensure structural changes both quantitatively and qualitatively in the industry, which will allow it to gradually reach the world level. Based on this, it is imperative that modern methods of studying consumer requests—the population's demand for transportation services—and further improving the consumer quality of transportation services are used to increase the efficiency of managing the quality of services of railway transport enterprises. This will help them make more money, elevate the social significance of railway transport, and gain a competitive edge.

Further research aims to provide a systematic methodology for evaluating the quality-of-service management of Ukrainian railway transport enterprises. Such studies should be aimed at analyzing the current state and prospects for the development of the quality management system of service for railway transport enterprises in Ukraine.

## ADDITIONAL INFORMATION

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## МЕТОДИЧНІ ОСНОВИ УПРАВЛІННЯ ЯКІСТЮ ПІДПРИЄМСТВ ЗАЛІЗНИЧНОГО ТРАНСПОРТУ

У статті розглядаються методичні основи управління якістю послуг залізничного транспорту. Наразі транспортна галузь України переживає надзвичайно складні часи. Це пов'язано з посиленням внутрішніх конфліктів щодо розвитку підприємств галузі, а також негативними зовнішніми факторами, пов'язаними з економічною та політичною діяльністю. Управління якістю на підприємствах залізничного транспорту передбачає створення систем управління якістю та заходів, необхідних для їх ефективного функціонування. Зазначено, що динаміка прибутку підприємств

залізничного транспорту значною мірою залежить від соціально-економічних факторів щодо потреб і можливостей використання високоякісних транспортних послуг, а також від техніко-технологічних можливостей.

У результаті було виявлено, що наявність вищевказаних розбіжностей і проблем має значний вплив на рівень управління якістю послуг, які надають залізничні компанії. На сучасному етапі інтеграції залізничної галузі України до транспортної системи ЄС необхідно чітко розуміти проблеми, які виникають у процесі. Тільки тоді можна буде ліквідувати розбіжності між очікуваннями споживачів і реальною якістю послуг, які вони отримують. У результаті було зроблено висновок, що управління якістю послуг підприємств залізничного транспорту повинне бути більш ефективним, використовуючи сучасні методи всебічного вивчення потреб споживачів і подальшого підвищення якості споживчих послуг. Це зроблено з метою отримання прибутку, підвищення соціальної значущості залізничного транспорту та отримання конкурентних переваг у майбутньому.

**Ключові слова:** якість послуг, технологія управління, залізничний транспорт, менеджмент, транспортне обслуговування

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