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IMPROVEMENT OF THE QUALITY MANAGEMENT SYSTEM IN THE TRANSPORT AND LOGISTICS SECTOR

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Abstract. Improving the quality management system in the transport and logistics sector is a critical element in ensuring efficient operations, reducing costs and improving customer service. Quality management in logistics covers all aspects of transportation, storage, handling and delivery of goods, which requires a systematic approach to achieve high standards of service. This topic is becoming increasingly relevant in the context of globalised markets, when competition between businesses depends on the ability to deliver goods to the end consumer quickly and efficiently. The study examines the main methods of improving the quality management system, including the implementation of international standards such as ISO 9001, the use of modern logistics technologies, process automation and the digitalisation of the transport system. One important aspect is the optimisation of supply chain management, which helps to reduce costs and increase productivity at all stages of logistics processes. The study also analyses the role of innovative solutions, such as the use of artificial intelligence and Internet technologies, in improving the efficiency of logistics operations. These technologies do not allow real-time tracking of processes, which impairs the increased transparency and accountability of transport operations. Particular attention is paid to the implementation of Lean and Six Sigma approaches, which can eliminate inefficiencies, reduce defects and improve the overall quality of transport and logistics operations. The novelty of this study lies in an integrated approach to improving the quality management system in the transport and logistics sector, taking into account modern technological trends such as digitalisation, automation and the use of innovative management tools. Unlike previous studies that have mostly focused on individual aspects of quality or technologies, this paper proposes the integration of new management methods that cover all key elements of transport and logistics processes. The results of the study demonstrate that improving the quality management system not only ensures the competitiveness of enterprises, but also provides better compliance with customer expectations, which is a key factor for success in today's market. The application of a systematic approach to quality management allows logistics and transport companies to achieve significant improvements in productivity, reliability and efficiency, which ultimately increases business profitability. The significance of the work lies in its contribution to the development of both the theory and practice of transport and logistics management. In the theoretical aspect, the study forms new approaches to optimising the quality of logistics processes by introducing modern management concepts and technological innovations that increase efficiency. In practical terms, this work will contribute to the creation of more sustainable, safe and environmentally responsible logistics systems that meet the modern requirements of the market and society. Thus, improving the quality management system in the transport and logistics sector is a strategic direction of development that ensures the long-term efficiency and sustainability of organisations in a competitive environment.

Keywords: quality management, logistics, transport systems, process optimisation, standardisation, supply chain management, transport efficiency, logistics innovation.

JEL Classification: L15, L89, L91, M11, O32

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Introducation

Recent years have been characterised by a rapid growth in both freight and passenger traffic. This is due to the gowth of international trade, the expansion of online commerce, the intensive development of the service industry and global urbanisation. This rapid growth requires improvements in logistics processes and transport infrastructure to ensure efficient flow management. Deficiencies in quality management in this area can lead to delays, higher transportation costs, reduced competitiveness and higher levels of cargo losses.

Improving the quality management system will help solve these problems related to late delivery, reduce the risk of damage to goods and ensure a high level of customer service. In addition, it will help to increase labour productivity, optimise costs and improve the reputation of logistics companies in the market.

The globalisation of markets has meant that modern companies must operate in multinational supply chains. This requires compliance with international quality standards, such as ISO 9001, which addresses the general requirements for a quality management system. Companies that integrate into global supply chains face the need to ensure not only internal quality standards but also compliance with international standards.

One of the most important aspects of modern transport and logistics is security, especially in Ukraine during the war. In the face of growing threats of missile and terrorist attacks, cyber attacks and other risks, the issue of ensuring the safety of transportation has become particularly relevant. In addition, environmental requirements for reducing emissions, energy efficiency of transport and the introduction of environmentally friendly technologies are becoming more stringent.

The quality management system in the transport sector must take into account all these new challenges, ensuring that transport and logistics processes meet safety and environmental standards. This includes the introduction of environmentally friendly vehicles, reduction of CO^2 emissions, use of renewable energy sources and continuous monitoring of transport safety.

Therefore, the study of improving the quality management system in the transport and logistics sector is extremely important in today's environment of rapid technological development, globalisation, and increased safety and environmental requirements. Implementing innovative solutions and adapting to new challenges will help improve the efficiency of companies, optimise costs, increase customer service and ensure long-term success in a competitive market.

1. Research Methodology

The research methodology for improving the quality management system in the field of transport and logistics includes an analysis of existing quality management systems (QMS), with an overview of modern approaches and QMS standards, such as ISO 9001, TQM, Six Sigma and Lean. The experience of successful companies in the field of transport and logistics in implementing these standards is studied and specific problems in the industry, such as supply chain efficiency, delivery time, and customer service, are analysed. The article identifies critical quality factors, identifies key quality parameters for logistics services, namely reliability, speed, safety, environmental friendliness, and others, and defines the main criteria that affect the quality of logistics services.

The most widely used standards are the ISO 9000-9001 series, which focus on quality management. They provide the basic principles of a systematic approach to quality, focusing enterprises on customer satisfaction, process approach, leadership and continuous improvement. TQM (Total Quality Management) is a broader philosophical framework that focuses on a culture of continuous improvement, employee involvement and a focus on quality at all levels of the organisation. TQM promotes improvement initiatives across all business processes (Kryvoruchko, Ovcharenko, 2021).

Scientific research by foreign scholars such as David J. Closs, Donald J. Bowersox (1996), Greiner R., Puig J., Huchery K., Collier N., Garnett (2014), J. R. Stock and D. M. Lambert (2001) focuses on the development of logistics strategies at the state level and at the level of individual logistics enterprises, as well as on logistics service strategies. Among the Ukrainian researchers working on this topic, the following are worth highlighting: Bliznyuk A., Kudryavtseva O. (2023), Hryhorak M., Karpun O., Katerna O., Mochanova K. (2017), Ilchenko N. (2016), Oaklander M. (2001), Kryvoruchko O. and A. Ovcharenko (2021).

The scientific works of J. Stock, D. Lambert, M. Hryhorak and M. Oaklander and other researchers provide a detailed discussion of the theoretical foundations of logistics services, methods of creating logistics service systems, as well as key stages and principles of managing this process. The most common in the literature and in practice is the division of logistics services into three main groups (Hryhorak, Karpun, Katerna, Mochanova, 2017), focused on the creation of a logistics service system (determining the policy of service provision, planning, etc.); those performed during the sale of goods (selection of assortment, packaging, formation of cargo units,

ensuring delivery reliability, providing information on cargo movement); and those that include warranty service, claims processing, exchange of goods, etc.

2. Results and Discussion

2.1. General Characteristics of QMS Implementation in Logistics

The experience of other countries in implementing quality systems in logistics shows that leading companies and countries are adapting different approaches to quality management to improve efficiency and competitiveness.

Japan is widely known for the implementation of Lean Management methodology in logistics and transport. Lean principles, such as elimination of losses and continuous improvement (Kaizen), have been integrated into the logistics processes of such giants as Toyota and Honda (Shah, Ward, 2002). Kaizen is a tool aimed at encouraging employees to develop and make suggestions for improvements that are implemented in the short term but are focused on achieving long-term results (Segerstedt, 1999).

Lean helps to optimise supply chains and reduce delivery times and costs. The Toyota Production System (TPS) has become a classic example on which other global logistics models have been developed.

In the United States, companies such as FedEx and UPS are implementing Six Sigma and ISO 9001 systems to improve service quality and reduce errors in shipment processing. Six Sigma is actively used to manage large volumes of shipments and optimise supply chains, which can reduce costs and improve process accuracy. Companies are also actively using ISO 9001 standards to certify their processes.

Germany is one of the leaders in the implementation of Total Quality Management (TQM) in logistics. DHL, for example, uses TQM to ensure a high level of customer service. The company is also introducing innovative logistics solutions, such as automated warehouses and delivery drones, to improve the speed and accuracy of order fulfilment.

Singapore is one of the leaders in the implementation of smart logistics. As part of the Smart Nation strategy, the government and logistics companies are integrating the latest digital technologies such as the Internet of Things (IoT), automation and data analytics to manage supply chains. This allows not only to improve the quality of service but also to make processes more transparent, environmentally friendly and efficient (Goals, 2024).

The integration of digital platforms in logistics is specific to China. In China, leading logistics companies such as JD.com and Alibaba are implementing advanced digital platforms to manage their supply chains. Using big data and artificial intelligence technologies, these companies are automating the tracking of goods, optimising delivery routes and reducing transportation time. This helps to improve the reliability of logistics operations and reduce costs.

Swedish companies are actively implementing environmentally friendly solutions in logistics, including using ISO 14001 standards that focus on environmental management. For example, PostNord is integrating electric vehicles and other eco-friendly vehicles to reduce CO^2 emissions and ensure environmentally sustainable logistics.

Thus, the implementation of quality systems in the transport and logistics sector is a global trend that helps companies increase efficiency, reduce costs, improve environmental friendliness and ensure customer satisfaction.

In Ukraine, the introduction of quality management systems in the transport and logistics sector is part of the national strategy to integrate into global markets and improve the efficiency of logistics services.

2.2. Analysis of Best Practices in Quality Management in Transport and Logistics

To improve the quality management system in Ukrainian transport and logistics companies, it is worth paying attention to international best practices that can be effectively integrated to improve the quality of service and process efficiency.

Implementation of ISO standardisation (international quality standards). Companies that implement ISO standards, such as ISO 9001 (quality management) and ISO 14001 (environmental management), gain a competitive advantage by improving the quality of services and enhancing their image. For example, international transport corporations such as *DHL* and *Maersk* successfully use these standards to ensure reliability and safety at all stages of the supply chain. Their systems include regular quality monitoring and auditing, which helps them respond quickly to changes and correct deficiencies.

Lean methodology, which aims to eliminate losses in production and logistics processes, and Six Sigma, which focuses on reducing variability and improving accuracy, are widely used in logistics. For example, *UPS* uses Lean Six Sigma to optimise delivery routes and minimise fuel costs, which reduces costs and increases the speed of customer service (Argiyantari, Simatupang, Basri, 2022).

The use of big data and IoT technologies allows companies to track and analyse operations in real time, which enables them to respond quickly to problems and improve service quality. For example, *Amazon* is implementing real-time cargo tracking technologies

to ensure delivery transparency and provide customers with accurate delivery times.

One of the best practices that can be implemented in Ukrainian companies is the use of automated warehouse management systems (WMS) and transport management systems (TMS). Companies such as *FedEx* use TMS systems for fleet management, which allows them to plan routes, monitor fuel costs, optimise loads, and monitor quality indicators in real time. This can significantly improve delivery accuracy and reliability (Tong, Ming, Zhang 2023).

As part of the global trend towards increased environmental sustainability, companies such as *Deutsche Post DHL* are actively implementing green logistics strategies, including electric vehicles and optimised freight routes to reduce carbon emissions. The use of such practices may be promising for Ukrainian companies, especially in the context of new EU environmental standards.

2.3. Recommendations for the Implementation of Quality Systems in Ukraine

Ukrainian transport and logistics companies can integrate these practices, taking into account national realities and capabilities. In particular, an important area is the introduction of digital technologies to improve process control and automate operations. The implementation of international quality standards (ISO 9001, ISO 14001) and the use of innovative methods (Lean, Six Sigma) will help achieve a significant increase in efficiency and competitiveness in the international market.

The introduction of such practices can help address key quality issues in transport and logistics in Ukraine, including increased management efficiency, reduced costs, improved control, and compliance with international standards (Connecting to Compete, 2023).

Improving the quality management system in the transport and logistics sector has a significant impact on the productivity of companies and systems in general (Oaklander, 2001). In particular, several key aspects can be identified: cost reduction, improved customer service, increased staff productivity, reduced process times, and increased competitiveness.

Implementation of methods such as *Lean* and *Six Sigma* helps to eliminate unnecessary costs and improve process efficiency. For example, reducing vehicle downtime, optimising routes, and reducing fuel and material costs can lead to significant cost savings. Companies that have implemented these methods have reduced their operating costs by 20-30%.

High-quality management systems can improve the accuracy of order fulfilment, reduce errors and delivery time, which contributes to an overall increase in customer satisfaction. Companies that use TMS and WMS systems can track every stage of delivery, providing customers with transparency and reliability of service. According to research, a 5-10% improvement in on-time delivery performance leads to increased customer loyalty.

The introduction of innovative approaches to quality management (digitalisation of processes, automation) helps staff spend less time on routine operations and more on strategic tasks. This can lead to an increase in labour productivity by 15-25%, as evidenced by the examples of companies such as *UPS* and *FedEx*.

Through the use of *big data, IoT*, and automation, companies can reduce the time it takes to complete key logistics processes, such as transportation and order processing. This allows for faster and more accurate delivery. For example, companies that have implemented an automated route planning system have reduced delivery times by 10-20%.

Companies that implement advanced quality management systems gain a strategic advantage in the marketplace, as they can offer better and more reliable service. As a result, it helps to expand their customer base and strengthen their market position.

Improving quality management systems has a direct impact on the key performance indicators of companies. This not only reduces costs, but also in creases customer satisfaction, improves internal processes and ensures long-term growth in the efficiency of transport and logistics operations.

3. Research Results

3.1. Optimisation Recommendations for the Quality Management System in Transport and Logistics

Consider some statistics on logistics and transport services provided by seaports in 2023. In 2022, a temporary sea corridor was opened in August. As a result, 430 vessels were accepted for loading through the corridor, and 400 vessels were dispatched, exporting 12.8 million tonnes of cargo (Statistical reporting, 2023).

In 2023, Ukrainian ports increased cargo handling by 5% yoy to 62 million tonnes. This can be considered the beginning of the industry's recovery after a difficult 2022, when port cargo turnover fell by 2.6 times compared to pre-war 2021 (Statistical reporting, 2023).

The dynamics of transshipment across ports show mixed results compared to 2022:

Port of Odesa – an increase of 9%, reaching 8.4 million tonnes;

Port of Chornomorsk – a decrease of 3%, down to 11.4 million tonnes;

Pivdennyi Seaport – a decline of 34%, to 10.1 million tonnes (Statistical reporting 2023).

The most dynamic transshipment growth is observed in the Danube ports (Port of Izmail, Reni Seaport and Ust-Danube Seaport). In 2023, the total cargo turnover at these ports almost doubled to 32 million tonnes, and tripled in 2022 to 16.5 million tonnes from 5.5 million tonnes in 2021. In particular, in 2022, the volume of transshipment at the Port of Izmail was 20.2 million tonnes (up 2.3 times by 2022), and at Reni Seaport – 10.1 million tonnes (+47% yoy) (Statistical reporting 2023).

Although grain cargo accounts for a significant share of Danube transshipment (62.5% in 2023), these ports are also important for the export of mining and metals products. In 2023, iron ore transshipment totalled 1.9 million tonnes (5.9% of total cargo turnover). In absolute terms, iron ore transshipment decreased by 9.5% compared to 2022, while ferrous metals transshipment increased by 2.1 times (to 1.7 million tonnes).

Based on the analysis of current practices and the results of the study, the following recommendations can be made to improve quality management:

The use of automation systems will improve the accuracy of quality monitoring, detect deviations from standards more quickly and respond to them promptly. For example, the use of *Warehouse Management Systems (WMS)* and *Transport Management Systems (TMS)* can provide automatic tracking of each stage of the logistics process, reducing the likelihood of errors. Automated systems such as RFID and GPS will help to monitor the movement of goods and compliance with safety standards in real time (Tong, Ming, Zhang, 2023).

Internet of Things (IoT) technologies allow for remote management of logistics processes and monitoring the condition of goods during transportation. IoT sensors installed on vehicles can transmit information about temperature, humidity, and pressure, which is especially important for sensitive cargo (medicines, food). This will help improve the quality of services and compliance with safety and environmental standards.

Big data processing enables companies to forecast demand, optimise routes and supply chain processes, identify potential quality management issues and resolve them quickly. Analytical platforms can process data in real time, allowing transport and logistics companies to respond more quickly to changes in market conditions and improve the quality of their services.

To achieve a competitive advantage in the global market, companies should update their internal quality standards in line with international standards, such as *ISO 9001* for quality management systems. This will help ensure that the highest levels of quality are maintained and will also facilitate cooperation with international partners.

Lean methodology and *Six Sigma* help to identify and eliminate losses, improve process efficiency and achieve high quality service. These approaches can reduce errors, increase resource efficiency and improve customer satisfaction. For example, transport and logistics companies can reduce the number of defects in their delivery processes, reducing time and cost.

As technology is constantly changing, it is important to invest in staff training to ensure they are competent in the latest quality management systems and tools. Regular training in the use of new technologies and management techniques, such as IoT or Big Data, will help maintain high levels of productivity and service quality (Preprint, Bharath Gowda, Abhilash, Pakeerappa, Bharath, Suchithra, 2022).

Optimisation of the quality management system in the transport and logistics sector requires an integrated approach, including the introduction of new technologies, standardisation of processes, and staff training. Thanks to such initiatives, companies will be able to increase productivity, reduce costs and improve the quality of services, which will contribute to their

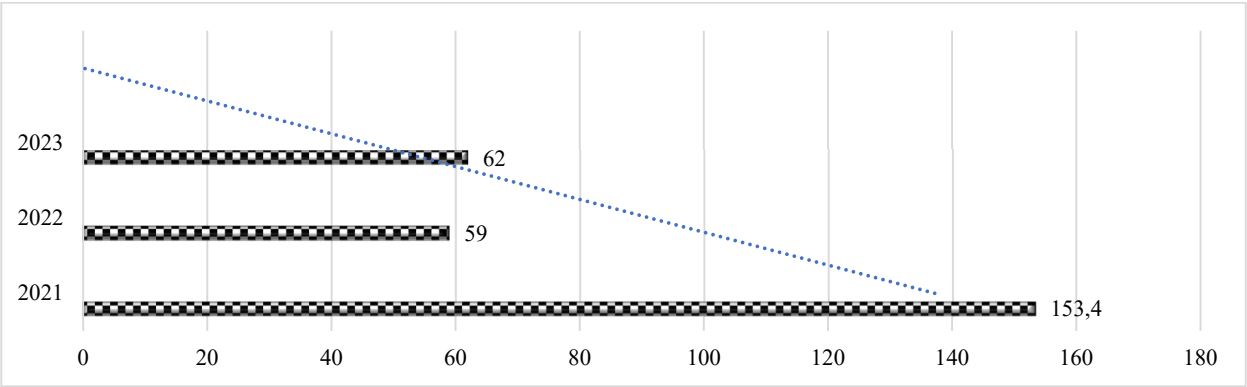

Figure 1. Cargo transshipment in Ukrainian ports in 2021-2023 (million tonnes)
Source: generated on the basis of data (Available at: http://surl.li/rfrdbp)

competitiveness in the global market (Martunyuk, Vitvitskaya, 2019).

Modern innovative technologies have significant potential to improve the quality of services and optimise processes in the transport and logistics sector. Among these key technologies and their capabilities is artificial intelligence (AI). Artificial intelligence is a powerful tool for analysing large amounts of data and making optimal decisions. The introduction of AI into transport and logistics processes allows forecasting demand and planning routes. AI can analyse historical data and predict the demand for transportation, optimise routes, which helps reduce fuel costs and shorten delivery times. AI algorithms help to optimise warehouse storage, manage inventory, and automate packaging and shipping processes. AI-powered autonomous driving systems can improve the safety and efficiency of freight transport, reducing the human factor and staff costs (Ng, Tai, Tan, Abd Rahman, 2021).

Robots are already actively used in logistics centres to automate routine processes. The introduction of robotics into the quality management system can include autonomous robots in warehouses. Robotic systems can efficiently perform the tasks of sorting, packaging and shipping goods, reducing order processing time. The use of drones for small and medium-sized cargo delivery can reduce delivery times and provide better control over the movement of goods, especially in urban or hard-to-reach areas. Robotic systems can perform regular inspections of vehicles and equipment to identify potential breakdowns or problems, which increases safety and reduces downtime.

Integrating IoT into transport and logistics allows for accurate monitoring and management of various aspects of the delivery process. This includes real-time transport monitoring. IoT sensors provide constant monitoring of the condition of the goods during transportation (temperature, humidity, speed), which helps to respond quickly to deviations. Continuous collection of vehicle condition data allows for timely maintenance, which reduces the risk of breakdowns and downtime (Preprint, Bharath Gowda, Abhilash, Pakeerappa, Bharath, Suchithra, 2022).

The integration of technologies such as artificial intelligence, blockchain, robotics and IoT into the transport and logistics quality management system helps to improve the efficiency, safety and reliability of logistics processes. These innovations not only help to optimise internal processes, but also improve customer service, reducing costs and increasing the competitiveness of companies in the global market.

3.2. Implementation of new Methodologies to Increase the Flexibility and Efficiency of Logistics Processes

Modern management methodologies, such as **Agile** and **Scrum**, which have long proven effective in IT and project management, can be used to increase efficiency and flexibility in the transport and logistics sector.

The Agile methodology focuses on rapid response to changes, flexible planning and continuous process improvement. In logistics, implementing Agile can have advantages such as process flexibility. Agile is suitable for managing logistics in the face of constant changes in demand, market conditions, or supplies. Agile allows to quickly adapt processes and services to the needs of customers, increasing customer satisfaction and loyalty.

Agile implies frequent plan updates and fast delivery cycles, which minimises the time to respond to unexpected changes and increases the speed of service (Zielske, Held, Kourouklis, 2022).

Scrum, as one of the most popular Agile methodologies, focuses on managing teams through short iterations (sprints) with clear goals. In logistics, Scrum can be used to optimise large projects and complex processes, such as **cross-functional teams**. Scrum involves the creation of small teams that include specialists from different fields (e.g., warehouses, transport, IT) (Rola, Kuchta, 2020). This allows to solve problems quickly and comprehensively. Regular short meetings (stand-up meetings) enable quick discussion of achievements, identification of problems and decision-making, which speeds up processes. Scrum ensures transparency in the execution of tasks and makes it possible to monitor progress in real time, reducing risks and increasing efficiency (Maharani, Luthfi, 2023).

Lean and Kaizen methodologies are important tools for reducing process waste and increasing efficiency. They are based on the concepts of continuous improvement and resource optimisation. The main principle of Lean is to reduce unnecessary costs, which helps to reduce the cost of logistics processes. This includes eliminating unnecessary steps, optimising fuel and storage costs, and increasing labour productivity. Continuous improvement of even small processes leads to significant improvements in quality and efficiency. Kaizen is being actively implemented in warehouses and transport processes to optimise work operations.

One of the key stages of implementing new methodologies is employee training. It is important to ensure that all levels of the company understand the principles of Agile, Scrum, Lean and Kaizen.

After analysing the current state of the company, the methodologies should be adapted to the specifics of

logistics operations, including transport, warehousing and supply chain management (Rola, Kuchta, 2020). The introduction of automated systems such as ERP and CRM will help integrate new methodologies with less time and resources.

Conclusions

Thus, the introduction of new approaches, such as Agile, Scrum and Lean, into transport and logistics processes will help to achieve greater efficiency, flexibility and quality, which are critical in today's increasingly globalised and digitalised world.

Agile and Scrum methodologies are successfully implemented in logistics companies both internationally and in Ukraine. For example, John Deere, a global leader in manufacturing and supply chain, uses Scrum to improve its supply chain processes. The company has implemented Scrum and Scrum@Scale to manage bottlenecks and solve problems during the COVID-19 pandemic, such as the global shortage of microchips. By working in two-week sprints, John Deere teams were able to quickly reprioritise and find creative solutions, including automating processes to ensure critical deliveries to keep production lines running. This flexibility and rapid adaptation are key benefits that Agile and Scrum have brought to their operations.

In Ukraine, Scrum Day UA 2021 highlights the growing adoption of Agile and Scrum practices, especially in IT and outsourcing companies, but these principles also apply to logistics. Companies like EPAM Systems and smaller firms are using Scrum to improve team collaboration and optimise project management. These techniques allow logistics and outsourcing companies to operate more efficiently in complex and changing environments, making them more adaptable and effective.

The combination of these local and international examples illustrates how Agile frameworks can significantly improve logistics by enabling faster decisions and better management of unpredictable variables.

The key findings of the study on improving the quality management system in transport and logistics demonstrate several important aspects. Namely, the need for more flexible and standardised quality management systems is growing in light of globalisation, digitalisation and increased traffic volumes. Improving such systems can significantly increase the competitiveness of companies in the international market and ensure compliance with environmental and safety requirements.

The use of modern technologies, such as big data, IoT, and artificial intelligence, is becoming an important tool for optimising processes, reducing costs, and improving customer service. This proves that innovation can significantly improve quality and efficiency in the transport and logistics industry.

Identified problems in quality management systems include insufficient standardisation of processes, low efficiency of management systems, and insufficient quality control at various stages of the supply chain.

The use of Agile and Scrum methodologies in transport logistics both abroad and in Ukraine has proven to be highly effective in improving coordination between teams, accelerating decision-making and adapting to market changes.

Key recommendations include the integration of automated quality control systems, expanding the use of innovative technologies such as blockchain and robotics, and introducing new management methodologies such as Agile and Scrum to ensure the flexibility and efficiency of logistics processes.

In general, the study shows that the introduction of modern methods and technologies can contribute to significant positive changes in the transport and logistics industry, improving quality and reducing service costs.

If the number of companies or regions surveyed was insufficient to generate broad generalisability of the results, this may have affected the representativeness of the findings. The sample was limited to certain transport and logistics companies, which may have specific conditions or may not be representative of the industry as a whole.

The geographical location or specific logistics sector on which a study has been focused may have unique characteristics that cannot be directly extrapolated to other countries or industries. For example, regional requirements for quality standards, legal restrictions or different levels of technological integration.

Not all companies have the same level of technological readiness or ability to implement new technologies such as artificial intelligence. This may have affected the results, as companies with weaker technological capabilities have different potentials for process optimisation.

The study is being conducted at a time when external factors, the economic crisis or the impact of the COVID-19 pandemic, and the war temporarily affect logistics processes and quality management, which in turn leads to certain distortions in the results.

These limitations indicate the need for further research to verify the results in different conditions and expand the sample, which will allow drawing deeper conclusions about the effectiveness of the quality management system in transport and logistics.

Further research into the integration of technologies such as artificial intelligence (AI), the Internet of Things (IoT), blockchain and big data into transport and logistics processes to improve quality management. It is worth exploring how process automation, AI forecasting and real-time tracking can improve

the efficiency of quality management and the safety of logistics operations. The impact of agile management methodologies such as Agile and Scrum on the quality of logistics processes should be investigated, especially in the face of market volatility and changing global transport requirements. More attention should be paid to the practices of adapting these methods in medium and large transport and logistics companies.

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