TRANSPORT SYSTEM INTEGRATION AND ECONOMIC DEVELOPMENT THROUGH INNOVATIVE INVESTMENTS

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Introduction. In recent years, the significance of digital transformation and innovative technologies in the global economy has increased considerably. The transport sector is no exception to this process, as a modern and efficient transport system is viewed as one of the key pillars of economic growth [1]. Innovative investments create opportunities to modernize transport infrastructure, digitalize logistics processes, and ensure effective integration between different sectors. Through such investments, not only is the freight and passenger transportation system optimized, but the activity of the domestic market and the potential of foreign economic relations also expand [2]. The main purpose of this article is to analyze integration mechanisms through the application of innovative investments in the transport system and to highlight their impact on economic development.

Methods. The study employs a comprehensive review of current practices and case studies from various countries, including European nations and Kazakhstan. It evaluates the technological areas receiving investments, such as automation of logistics, IoT applications, and autonomous transport tools. Data sources include government publications, industry reports, and examples of digital platform implementations, such as the automated monitoring systems in Tashkent. The analysis also considers risks and challenges, specifically financial costs, cybersecurity threats, and personnel shortages, by synthesizing expert opinions and recent research findings.

Results. It is well known that the transport system functions as the bloodstream of the economy. A competitive transport infrastructure accelerates the circulation of goods and services, increases production efficiency, and reduces logistics costs. Innovative investments represent financial resources aimed at introducing new technologies, implementing digital platforms, and developing automated management systems [3].

In the transport sector, such investments mainly cover the following areas [4]:

- automation of logistics processes and intelligent monitoring systems;
- introduction of IoT technologies and “smart” transport infrastructure;
- drones, robotics, and autonomous delivery tools;
- electronic monitoring systems and digital management platforms.

The concept of integration in the transport sector refers to the alignment of different modes of transport, infrastructure networks, and logistics processes, combining them within a unified management and information-sharing system[5]. The introduction of digital technologies significantly accelerates this process, ensuring safety, strengthening cooperation among operators, and increasing service efficiency.

Currently, in several countries, the practice of integrating the transport sector based on digital platforms is actively developing. In particular, in European countries and Kazakhstan, freight and passenger transportation operations are being optimized through digital platforms that manage logistics processes [6]. In the case of Tashkent city, the introduction of automated monitoring

systems overseeing transport movement is noted as a practical example of digital management [7]. At the same time, although innovative investments are crucial for economic growth and infrastructure modernization, they also bring certain risks and complexities [8]. In particular, the introduction of new digital technologies requires substantial financial expenditures, while cyber threats and data security issues, as well as the shortage of highly qualified personnel, constitute major challenges in this sector.

As a result of the implementation of digital transformation, logistics costs may decrease by an average of 15–25%. This, in turn, leads to accelerated circulation of goods and services and increased competitiveness in production and service sectors[9].

Innovative integration and digital transformation stimulate economic development on the basis of the following strategic directions [10]:

- optimal organization of trade turnover and logistics processes;
- increasing efficiency in the production and service sectors;
- strengthening national and regional economic cooperation and integration;
- ensuring environmental sustainability and the rational use of energy resources.

Discussions. The introduction of innovative investments in the transport system and the processes of integrating it not only increase the operational efficiency of the sector but also positively influence the overall economic development of the country. The broad application of digital technologies, “smart” logistics systems, and automated management instruments makes it possible to modernize transport infrastructure, ensure efficient use of resources, and improve service quality. Therefore, innovative investments are considered one of the strategic drivers of sustainable development in the transport sector.

Based on the analysis, the following proposals and recommendations have been developed for integrating the transport system through innovative investments and increasing its efficiency in the national economy:

1. Expanding public–private partnership. It is necessary to strengthen cooperation between government bodies and the private sector in the introduction of digital transport platforms and modernization of infrastructure, as well as to increase investment attractiveness.
2. Attracting investment into innovative projects and developing human capital. It is important to expand financial support mechanisms for the implementation of innovative technologies and to improve the system of training qualified specialists in the fields of digital logistics, IoT, and information security.
3. Deepening national and regional integration. It is necessary to increase the interconnectedness of transport networks, develop interstate logistics corridors, and elaborate long-term strategic programs and roadmaps.
4. Strengthening cybersecurity and data protection systems. To ensure stable and secure functioning of the digital transport infrastructure, modern cyber-protection standards must be introduced, the security of information exchange ensured, and preventive measures taken to avoid accidents.

The implementation of these recommendations will contribute to increasing the competitiveness of the transport system, reducing logistics costs, accelerating trade turnover, and achieving sustainable growth in the country’s economy.

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