Секція 6

Маркетинг та менеджмент у системі управління суб'єктами підприємництва

TECHNOLOGICAL ADVANCEMENTS IN LOGISTICS INFORMATION SYSTEMS FOR TRANSPORT ENTERPRISES

Fedotova I.V., Doctor of Economic Sciences, Professor
Bocharova N.A., PhD in Economic Sciences, Associate Professor
Kharkiv National Automobile and Highway University

The rapid advancement of digital technologies within Industry 4.0 and emerging Logistics 4.0 frameworks is transforming transport logistics by optimizing operations, enhancing customer service, and improving cost efficiency. With the integration of Big Data, IoT, AI, and blockchain, modern Logistics Information Systems (LIS) now offer real-time tracking, predictive analytics, and streamlined coordination across the supply chain. As the logistics sector moves toward Logistics 5.0, with a focus on sustainability and human-centered processes, the adoption of these technologies becomes essential for transport enterprises to remain agile, resilient, and competitive in an increasingly digital market.

This shift towards advanced digitalization highlights the crucial role of Logistics Information Systems (LIS) as they evolve to meet these demands. Numerous researchers [1-4] are actively addressing the challenges of optimizing logistics processes, enhancing data transparency, and increasing operational efficiency in transport enterprises. Building on their work, several key technological trends in LIS have been identified:

– Internet of Things (IoT). IoT devices enable real-time tracking of vehicles and cargo, which supports predictive maintenance, route optimization, and enhanced safety measures.

– Big Data Analytics (BDA). BDA analyzes historical data to forecast demand and streamline resource allocation, helping logistics enterprises respond dynamically to market fluctuations.

– Artificial Intelligence (AI) and Machine Learning (ML). AI and ML automate logistics processes such as demand forecasting, route planning, and customer service, reducing operational costs and improving service delivery.

– Cloud Computing (CC). Cloud-based solutions provide seamless data sharing across the logistics chain, allowing for collaboration in real-time between carriers, suppliers, and customers.

– Blockchain Technology (BCT). Blockchain offers secure and tamper-resistant record-keeping, which improves transparency and trust in complex logistics networks.

– Cyber-Physical Systems (CPS): CPS integrates physical processes with digital information, creating real-time feedback loops that enhance operational control over logistics processes, such as warehouse automation and cargo tracking.

– Autonomous Vehicles (AV) and Drones. Autonomous delivery vehicles and drones are beginning to transform last-mile logistics, reducing delivery times, fuel consumption, and labor requirements in urban areas.

– Robotic Systems (RS). Robotic systems enhance warehousing and material handling, reducing human error and speeding up logistics operations. In transport logistics, RS can streamline cargo handling, especially in large-scale distribution centers.

Adopting advanced technologies within LIS is essential for reducing operational costs, increasing flexibility, and improving customer service. Enhanced information systems allow firms to quickly adapt to changing demands, achieving competitive advantages through streamlined, responsive logistics processes. Real-time data exchange, secure information handling, and compliance with industry standards ensure seamless coordination among logistics stakeholders.

Logistics operations increasingly rely on paperless documentation, AI-driven automation, blockchain transparency, and cloud-based data sharing. Such innovations drive efficiency and collaboration, allowing logistics enterprises to be more agile and responsive to market demands. Effective logistics management requires technical measures such as unified coding systems, RFID and QR tracking, centralized databases, and disaster recovery protocols to ensure data security. Ensuring compliance with international logistics standards further enhances operational resilience and facilitates cross-border transport. Core LIS functions include order management, processing, distribution, transportation, and procurement. An effective LIS ensures real-time data support for operational activities, from order acceptance to delivery, optimizing the entire logistics cycle and enhancing interaction between carriers, manufacturers, and customers.

Integrating new technologies and adhering to organizational protocols within LIS enables transport enterprises to remain competitive and adaptive to market demands. Enterprises that leverage these advanced systems gain agility, responsiveness, and enhanced operational control, positioning themselves as leaders in the evolving logistics field.

References:

1. Akhtar M. Industry 4.0 Technologies Impact on Supply Chain Sustainability. *Supply Chain - Recent Advances and New Perspectives in the Industry 4.0 Era.* IntechOpen, 2022. DOI: 10.5772/intechopen.102978

2. Zhandark K.S. The Applications of Artificial Intelligence in Logistics and Supply Chain. *Turkish Journal of Computer and Mathematics Education (TURCOMAT).* 2021. Vol. 12, № 13. P. 4488–4499. DOI: 10.17762/turcomat.v12i13.9617

3. Fan M. International Logistics Management System Based on Cloud Computing Technology. *Wireless Communications and Mobile Computing*. 2022. Vol. 2022, № 4. P. 1-8. DOI: 10.1155/2022/4317578.

4. Karakaş, S., Acar A.Z., Kucukaltan B. Blockchain adoption in logistics and supply chain: a literature review and research agenda. *International Journal of Production Research.* 2021. Vol. 62, № 1. P. 1-24. DOI: 10.1080/00207543.2021.2012613.

OVERVIEW OF APPROACHES TO THE EFFECTIVE USE OF OUTSOURCING IN ENTERPRISES

Kudriavtseva O.V., PhD in Economics, Associate Professor
Yang Hang
Kharkiv National Automobile and Highway University

The effective use of outsourcing by enterprises is largely related to the specifics of the domestic economy, which differs significantly from the economies of developed countries, so the problem of improving approaches to the effective use of outsourcing is quite relevant. Currently, there are different points of view on this instrument of cooperation between enterprises, let us consider some of them. The first approach suggests studying outsourcing from the point of view of its differentiation into 3 components: macroeconomic, microeconomic and operational.

This product component of outsourcing is associated with the interaction of enterprises on the basis of division and cooperation of labor. The company independently determines the core activities that ensure the competitiveness of the business (division of labor), outsourcing non-core processes and functions, which in turn are core for the outsourcing company (labor cooperation).

The operational component involves considering outsourcing as a tool for increasing the competitiveness and efficiency of enterprises, reducing production costs, strengthening market positions, distributing risks, increasing flexibility and maneuverability in an ever-changing environment.

The second approach considers the use of outsourcing from the perspective of the organization's life cycle, which traditionally includes four stages: inception, growth, maturity and decline. At each of these stages, outsourcing is possible, but the nature of outsourcing will change.

At the nascent stage, an enterprise is in the process of formation, goals and objectives, and core values are beginning to be formed, so at this stage it is advisable to use outsourcing only for those functions and business processes that require significant time and resources to perform independently, i.e. for technological, financial or any other reasons.

At the growth stage, the company is actively developing, increasing revenues, expanding markets for its products, and its strategic development goals have been finalized, so at this stage it is advisable to use outsourcing to improve the efficiency of