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AI-Driven Transformation: Mapping the Course for Future Business Landscapes

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AI-Driven Transformation: Mapping the Course for Future Business Landscapes is a comprehensive and interdisciplinary monograph that explores the current and future impacts of artificial intelligence (AI) on various domains of business and society. The book has six chapters covering a different aspect of AI-driven transformation. The first chapter examines how AI can enhance business leadership and entrepreneurship and the risks and challenges of its application. The second chapter analyzes how AI can transform the tourism industry, from improving customer service to creating new experiences. The third chapter discusses how AI can improve the security and efficiency of the financial sector, especially in the context of central bank digital currencies. The fourth chapter addresses the ethical and regulatory issues of AI deployment in companies and social enterprises, focusing on logistics and responsible practices. The fifth chapter explores how AI can enable innovative healthcare and military applications, such as integrating diagnostic models and enhancing civil and military capabilities. The sixth and final chapter looks at the future of technology and its impact on education and responsible innovation, with a particular emphasis on the role of AI in journalism and media. The book offers a rich and diverse perspective on the opportunities and challenges of AI-driven transformation and provides valuable insights and recommendations for researchers, practitioners, policymakers, and educators.
This book is intended for researchers, practitioners, students, and anyone interested in learning more about AI-driven transformation's current and future trends.

Keywords: artificial intelligence, entrepreneurship, innovation, digital marketing, industry transformation, leadership, education, skills, social impact, global perspectives, human-AI collaboration, future workforce, ethical implications.

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Abstract

The article substantiates the necessity for state regulation governing the functioning of logistics systems within the framework of digital technology advancement. The identified priority areas for state regulation of logistics processes include enhancing the regulatory and legal infrastructure supporting logistics systems development. This involves establishing a comprehensive regulatory framework addressing the quality of logistics services. Additionally, the emphasis is on facilitating the mobilisation training of logistics social enterprises and encouraging their engagement in the implementation of mechanisms of public-private partnerships.

The research affirms the imperative of incorporating artificial intelligence and automated processes into logistics systems. It was established that the integration of digital technologies into logistics processes contributes to forming a comprehensive understanding of the system's operation. This integration further leads to cost reduction, effective cost control, enhanced movement oversight, and heightened flexibility and adaptability of the logistics system. The study substantiates principles and guidelines for modelling logistics systems management, emphasising promising avenues in modelling logistics systems by utilising algorithms for collective artificial intelligence. The proposed information support for the management of logistics systems is also outlined.

Keywords: *state regulation, state administration, social enterprise, management, logistics systems, artificial intelligence, information support, modelling.*

JEL Classification: F01, O10, O30.

Introduction

The logistics system in Ukraine demands enhancement and refinement, with its primary objective being the provision of state-supported adherence to public production standards, compliance with national security requirements, maintenance of an expansive infrastructure, and facilitation of Ukraine's foreign economic relations.

The logistics industry dynamics are contingent on substantial shifts resulting from state-regulated operational conditions and the integration of technological innovations into social business processes. Emerging logistics management solutions of the new generation are geared toward rendering supply chains more customer-centric and resilient to unforeseen circumstances. This evolution establishes institutional prerequisites for the informatisation and automation of logistics systems at the national level. Achieving this necessitates a systematic understanding of the developmental trends in modern logistics systems across various economic groups in the context of informatisation and state regulation of such processes.

The article aims to determine the state influence on the management of logistics systems in the development of artificial intelligence and to substantiate the principles and provisions of the modelling of information support for social enterprises with the management of logistics systems.

Methods. Traditional methods of substantiating management decisions regarding logistics systems cannot cope with information diversity. Processing information arrays is only possible by using a complex of specialised software and technical tools and instructions and regulations regarding collecting, storing, processing and transmitting information. It is this set of tools that makes up the information support in the management of logistics systems. Therefore, it is proposed to use the principles of construction of regulatory, technical and software components in information support and implementation to control logistics flows, which will provide an opportunity to increase the efficiency and validity of management decision-making and the timeliness of detecting deviations from the planned logistics paths.

Prospective directions in modelling logistics systems are proposed to be determined using algorithms of collective artificial intelligence. These algorithms work better for networks with high flow specificity. On the other hand, traditional algorithms have a more significant share in generating predictions for more standard distribution networks. In addition, we suggest using the positive impact of modern technological solutions (such as cloud technologies, EDI and flow tracking standards).

Analysis of recent research and publications. The problems of state influence on logistics management are reflected in the studies of scientists D. Wood, D. Wardlow, E. Harold, D. Lamber, M. Christopher, R. Shapiro, and others.

In his work, Hryhorak M. (2017) investigates the patterns of formation and development of the logistics services market aspects of logistics flow management.

Risk management in logistics systems is considered in the work of Kulyk, Yu. (2017).

Evaluation of the effectiveness of logistics systems is investigated by the author of the work (Kulyk, 2017).

Kaliuzhna N.H., Sheremet A.S. (2022) analyse the current issues and recovery priorities in the logistic system. The authors propose solutions and prioritise critical areas for the recovery and improvement of the logistic system.

Zhuravel V. (2022) explores the challenges and opportunities for the logistics industry during times of war, reforms, and future development. Examines the impact of warfare and reforms on logistics operations and the potential for growth and advancement in the field. The goal is to uncover the resilience and adaptability of logistics in challenging circumstances and its potential for future success.

Hrynchak N. A. (2021) analyses quantitative data and statistical indicators to assess the current state of the logistics market, identify trends, and draw conclusions about its effectiveness. The research aims to contribute to understanding the logistics industry and provide valuable information for decision-making by policymakers, businesses, and researchers.

The authors (Zaverbny, Dvulit, & Vuyek, 2022) believe that the critical areas of improvement and renewal of logistics should include:

- refusal (full/partial) from accumulation storage of goods in significant volumes;
- a high level of dynamism in warehouse conditions (the opening of the warehouse used to last three months, then in the conditions of war, the evacuation of business from the regions of hostilities required immediate decisions and actions);
- complication of logistics operations, lengthening of logistics chains, their diversification/multiplicity (it is necessary to form several alternatives and scenarios and not rely only on a single option);
- a clear focus on the consumer, demand forecasting and, accordingly, planning of sales, logistics operations, etc.

The authors (Peshko & Zaverbnyi, 2022) believe that to minimise risks in the current situation in the conditions of war in the supply chain, one should:

- review the rules of inventory management: cycles and stages of orders, minimum and maximum lot size, and delivery arm. Reservation of essential for the network volumes of products, which gives confidence that in a few days or another specified period, the product will be reserved from the supplier;
- allocate stocks according to the speed of delivery of goods to the final consumer, consumption volumes, and potential storage risks.

Pletneva, N. (2008) considers the management of logistics systems under conditions of uncertainty and the resulting risk.

Artificial intelligence is the backbone of the new logistics system, emerging on the foundation of informatisation and computerisation.

It is promising to use collective artificial intelligence algorithms, notably the particle swarm algorithm (Kaedure Bakhuet, 2018).

The application of digital technologies is a topic of research, and there is a "Radar of trends in logistics" (The official site of DHL, 2018), which is periodically issued by the "DHL" company and is dedicated to current changes and prospects for the development of technologies in the field of logistics.

The preliminary analysis of the study of this problem in the economic literature made it possible to conclude the insufficient consideration of the logistic approach in the conditions of the development of artificial intelligence as one of the directions for increasing the efficiency of production, ensuring the survival of the social enterprise in new business conditions.

At the same time, many aspects of state influence on the functioning of logistics systems in the context of the development of digital technologies require further research.

Presenting main material. The priority direction of state regulation remains the improvement of regulatory and legal support for the development of logistics systems, including the creation of a regulatory and legal framework regulating the issue of the quality of logistics services, ensuring the mobilisation training of logistics social enterprises and their implementation of the development of public-private partnership mechanisms that provide a clear legislative distribution of rights and responsibilities and risks between the state and the investor, as well as determining the priority areas of these mechanisms. However, in Ukraine, examples of public-private partnerships in logistics can be traced, mostly only at the project stage.

State regulation of logistics systems is associated with risks that may prevent achieving planned results (Galat, 2023). These risks include macroeconomic risks associated with a decrease in the economy's growth rate and the level of investment activity, a crisis in the banking system, and a budget deficit. However, one of the most significant problems of state regulation is the unbalanced development of the unified logistics system of Ukraine.

Overall, effective logistic management practices in public administration directly impact cost efficiency. By optimising processes, resources, and service delivery, logistic management contributes to reducing costs, improving resource utilisation, and enhancing the overall economic performance of public administration entities. Logistic management plays a significant role in influencing service quality within the realm of public administration. By ensuring timely delivery, accuracy, effective resource allocation, handling exceptions, promoting coordination, and enabling continuous improvement, logistic management contributes to providing high-quality services to constituents. Public administration

entities prioritising and investing in effective logistic management practices are likelier to achieve and maintain superior service quality standards (Galat, 2023).
At the current stage of development of economic relations, the information sphere is one of the most attractive for capital inflow and potential for development. The gradual global informatisation of society and business in recent years, the accelerated development of information technologies and techniques, the deepening of public needs for the emergence and development of information services, the informatisation of production processes and the manufacture of socially important products became the primary basis for the emergence of a relatively new sector of the economy - information.
If we analyse the modern aspects of the functioning of logistics at social enterprises, we can anticipate an increase in the scale of digitalisation in the field of logistics in the coming years. With new companies seeking to capture the market and logistics firms cooperating with technological startups, the development of logistics has accelerated tenfold.
The industry's development process continues, driven by the emergence of **innovative technologies** such as cloud logistics, IoT, big data, and blockchain. These technologies are contributing to making the supply chain more customer-centric. Among them:
Big data and machine learning transform the logistics business model from reactive to predictive. The use of artificial intelligence has simplified demand forecasting, route optimisation, and risk management, enabling the application of predictive analytics. (Our Executive MPA Concentrations: Digitalisation and big data, 2023 URL:https://www.hertie-school.org/en/admissions-blog/detail/content/our-executive-mpa-concentrations-digitalisation-and-big-data).
Cloud logistics. The most popular developers of cloud solutions now are AWS, Microsoft Azure, Google Cloud and Oracle. Services such as Shipwire and Freightly provide real-time cloud-based transport management systems. They cover all logistics processes from procurement to invoicing, making the process simpler and cheaper for companies. Cloud logistics is quickly becoming popular: 50% of logistics service providers already use cloud services, and 20% plan to do so. (Khmarni tekhnolohii. Perevahy i nedoliky. Shipwire. URL: https://www.shipwire.com).
Internet of Things (IoT) should be understood as network of physical devices, vehicles, appliances and other physical objects that are embedded with sensors, software and network connectivity that allows them to collect and share data. Organizing such networks makes it possible to reduce human involvement in production and logistics processes, thereby minimizing the risks associated with the human factor. (Internet of Things: Science Fiction or Business Fact? A Harvard Business Review Analytic Services Report [Electronic resource]. Access mode: https://hbr.org/resources/pdfs/comm/verizon/18980_HBR_Verizon_IoT_Nov_14.pdf).
The implementation of the Internet of Things (IoT) concept in logistics operations enables real-time monitoring of assets, equipment, vehicles, cargo, and the work of individuals throughout any part of the supply chain. This allows for the analysis and management of their effectiveness, the automation of business processes, improvement in forecasting quality, and a reduction in total costs. (Internet of Things in Logistics. A Collaborative Report by DHL and Cisco on Implications and Use Cases for the Logistics Industry [Electronic resource]. Access mode: http://www.dhl.com/content/dam/Local_Images/g0/New_aboutus/innovation /DHLTrendReport_Internet_of_things.pdf). According to analysts' forecasts, IoT will contribute 1.9 trillion dollars to the global logistics industry in the next three years. 'Smart' trucks will gather data on movement and idle time for dynamic route planning and maximising fleet utilisation, ultimately reducing maintenance costs. DHL operators already have warehouses connected to IoT. (The official site of DHL (2018). Logistics Trend Radar. Version 2018/19", available at: https://www.logistics.dhl/global-en/home/insights-and-innovation/thought-leadership/trend-reports/logistics-trendradar.html)
Blockchain. Blockchain technology is anticipated to boost global GDP by 5% and international trade by 15%. Initiatives like Waltra's Food Traceability Initiative, utilizing blockchain for product traceability, ensure complete transparency throughout the product journey. Additionally, blockchain can automate invoicing and payment, processing payments as soon as goods arrive at their destination (ANT-Logistics. URL:https://ant-logistics.com/uk/main.htm URL: https://dolphincargo.com.ua/ua/texnologiya-blokchejn-v-logistici/) Modelling and automation of

logistics processes make it possible to increase the productivity and efficiency of the work process. Supply chain traceability and transparency is an essential component.

3D printing shops. Companies can replace some service points or stores with 3D mini-factories. They can look like copy centres or points for printing images or advertising products, where the customer needs to bring a file with information to get the desired effect. A 3D printing store can offer customers information with a prototype of the desired product, which the consumer will print himself. This is the most challenging concept from the point of view of implementation, as it requires, firstly, the development of the 3D printing technology itself (the existence of a large assortment of printing materials, reducing the cost of the service), secondly, exceptional knowledge and training of customers, thirdly, it is unclear, how companies will protect their product from "piracy" copying (3D Printing and the Future of Supply Chains. A DHL perspective on the state of 3D printing and implications for logistics [Electronic resource]. Access mode: http://www.dhl.com/content/dam/downloads/g0/about_us/logistics_insights/dhl_trendreport_3dprinting.pdf).

Logistics of the circular economy. The concept is proposed to solve the current problems of environmental deterioration and limited resources. The circular economy concept is based on the 3R principles: Reduce, Reuse, and Recycle. To ensure a long life cycle of goods and the possibility of their reuse, restoration and modernisation, the concept should be implemented at the earliest stages - planning and development of goods (Zvarych, 2017).

The most advanced technology for logistics is artificial intelligence systems (AI). AI programs typically comprise modular components of rules and behaviours, which are not executed in a strictly specified order but are activated as needed based on the structure of a specific task. Coincidence detection systems enable the application of general rules to a wide range of functions. These systems exhibit unusual flexibility, allowing relatively small programs to display diverse behaviours across a broad spectrum, responding to various tasks and situations (Hroznyi, 2021).

AI systems are broadly categorised into two groups:

Applied Artificial Intelligence (also known as weak/applied/narrow AI): This type of AI is designed to solve specific intellectual problems or a limited number of them. Examples include systems for playing chess, pattern recognition, speech, and decision-making.

Universal Artificial Intelligence (Strong AI/Artificial General Intelligence (AGI)): This is a hypothetical (for now) AI that can theoretically solve any intellectual problem.

In the development of narrow AI systems, four primary engineering approaches have been identified: logical, structural, evolutionary, and imitation (Hroznyi, 2021)

An illustrative instance of successful AI integration into logistics processes is planning. In the realm of planning logistics activities, the use of artificial intelligence can surpass human potential. The combination of experience, responsibility, customer service specifics, flexibility, common sense, and repetitive process automation yields a more significant synergistic effect. (Iakovenko, 2010).

In our opinion, the principles and provisions of modelling in the management of logistics systems include the following:

Formalisation and comprehensive reflection of real problems. This involves applying adequate methods and models while maintaining a balance between the complexity of the mathematical model, the ability to obtain necessary data, the reliability and adequacy of the data, the duration of the modelling process, and the timely receipt of results.

Adaptability to changing conditions. This includes adapting existing methods and models to changes in the number of tasks, the number of their parameters, and the completeness and reliability of parameters.

Precise control of input data reliability. They are ensuring the reliability, completeness, accuracy, and adequacy of input data, considering changes in the periodicity of their receipt.

Utilisation of modified or hybrid models and methods. This involves combining different models and methods or modified and hybrid approaches to address complex logistics problems. It's worth noting that a set of models may be necessary for particularly complex tasks, each interacting to solve specific sub-tasks and collectively addressing the entire problem.

A hybrid model is recognised, wherein the particle swarm method is employed to define a set of initial potential solutions for the problem. At the same time, the ant algorithm is utilised to explore additional solutions (Kai, Xiaoning, et al., 2014). Similarly, it is advantageous to develop hybrid models incorporating various algorithms of collective artificial intelligence.
In our perspective, algorithms of collective artificial intelligence (expressly, the ant algorithm, bee algorithm, bat algorithm, artificial immune system, and particle swarm method), along with cognitive technologies, Petri nets, fuzzy sets, and fuzzy logic, represent promising avenues for modelling logistics systems. Artificial neural networks and queueing theory (the theory of mass service) continue to be relevant.
Among the problematic issues of a low level of automation of logistics systems is the cost of software and maintenance. It was determined that automation can significantly help in performing the following tasks:

- creation of a complete picture of functioning;
- construction of the management vertical;
- cost reduction and cost control;
- movement control;
- increasing flexibility and adaptability of the system.

The creation of information support for the management of logistics systems mostly does not take into account the features of the external environment, which has elements of the information economy (Grzelak, Borucka & Buczyński, 2019; Gupta, Singh & Suri, 2018; Kmiecik, 2021). Therefore, there is a need to develop a structure of information support for the management of logistics systems, which should consider the available world achievements in technologies for processing information flows and automating sales and management processes.
When developing information support for the management of logistics systems, it is proposed to distinguish three of its main components:

- technical information support;
- software information support;
- regulatory information support.

Technical information support means a set of technical means that ensure registration, transfer and display of information and processing of this data. These means are network communication equipment, various sensors with Internet of Things technologies, etc. (Kramarz, 2022). In addition, technical information support can include means that can be used for data collection - public means of data collection (for example, web cameras) and personal devices for the supply of individual data from which their owners have given consent (for example, smartphones with installed specialised applications).
Software information support for managing logistics systems is a set of universal and specialised software products (Makovetskaya, 2019) which are used to implement regulatory support based on technical support. Versatile software realises the collection and transfer of data, as well as the functioning of technical support. Specialised software implements data processing models necessary for logistics system decisions (Shu, Guo, 2019).
Regulatory information support for managing logistics systems is understood as a set of instructions, regulations, models, standards, etc. The regulatory information support itself should be the basis of the other two components in developing information support for managing logistics systems. Only after the development of the regulations can the appropriate technical means be configured, and the software necessary for the operation of the equipment and the implementation of the rules can be developed.
When developing regulations, it is proposed to distinguish between rules for monitoring the internal and external environment and regulations for interaction when making management decisions. The processes of monitoring the external and internal environment are critical. Monitoring refers to a system of observing, evaluating, and forecasting the state of a phenomenon, process, or other object for its control, management, and detection of compliance with the desired shape or established standards (Heeks, 2016).
In the context of the development of information support for the management of logistics systems under the monitoring of the external environment, a method of data collection and evaluation of indicators is

meant. One of the main results of external monitoring is the substantiation of conclusions regarding the competitiveness of the logistics system.
In turn, internal monitoring is a system of data collection and evaluation of indicators that reflect the efficiency of the logistics system, primarily innovative processes. The degree of automation and informatisation is evaluated. Creative business processes mean processes of introducing new technologies.
The regulations of interaction in the logistics system are instructions and administration regarding the exchange of information between units and between counterparties, as well as regarding the rules for making management decisions and responsibility for their implementation. Interaction regulations should be related to the results of monitoring the internal and external environment; that is, changes in the regulations should improve the expected indicators of competitiveness.
All the regulations mentioned above should be formalised in the job instructions, ensuring the transition to the next stage of information system development - the development and implementation of technical information support.
The direct development of regulatory information support should be carried out by specialized divisions, the primary purpose of which is innovation, and by general divisions. The result of regulations for monitoring the external environment is carried out by marketing and research and development divisions; it is research and development divisions that are responsible for researching technologies and competitors (Chechel, Zelinska, 2023).
The development of internal environment monitoring regulations according to the proposed scheme will be carried out by support units, analytical units and production units. Analytical teams, which include those that carry out planning and forecasting of the logistics system, in the mode of coordination with potential executors, determine the indicators for monitoring and exactly how the data for them should be collected. Support units that carry out accounting, tax and financial accounting, logistics and transportation support and other non-core activities necessary for implementing the production and sales program offer clarifications to the regulations developed by analytical units.
After the creation of regulatory information support, the development and implementation of technical information support for the management of logistics systems can be carried out, the main components of which are the implementation of public means of data collection, the performance of the Internet of Things, and the implementation of general technical support.
General technical support is necessary for the functioning of all other types of support, and it is not specialised and does not require personal development for the needs of the logistics system. The IT department handles its implementation and configuration.
The main information technology support is the Internet of Things (Internet of Things), in which various sensors and transmitters (or electronic markers and barcodes) are built into both equipment and finished products or spare parts. This makes it possible to monitor the movement of material assets and the progress of the production program in real-time. In addition, this technical equipment can be used to collect information about the operation of the product after its sale to the consumer. Accordingly, this type of technical support should be implemented by its direct users - production units and specialised support units- and by specialised units with qualified specialists - research and design and IT units.
After the implementation of technical support, software information support can be developed, the main elements of which are support for the performance of data processing models, help for justifying decisions, and support for internal and external interaction. Moreover, during the development of software, there is a constant need to return to the stage of development of technical support due to the clarification of requirements and needs for processing information flows and the necessary capacities for this. The story of all components of information software is carried out by IT departments together with analytical departments based on previously established regulations; third-party developers and consultants may also be involved are shown in Table 1.

Table 1 - Measures for the development of information support of the logistics system

Directions of development	Measures for the development of information support
Development of information support	Introduction of elements Internet of Things
	Providing lower management units with equipment to access the information system
	Improving the qualifications of the lower management of the divisions regarding information technologies
Development of information support in the marketing sphere	Creation of a feedback system for consumers
Development of information support in the management sphere	Development of an automated workplace of an analyst for assessing competitiveness
	Development of the automated workplace of the modernization analyst
	Development of an automated workplace of a strategic planning analyst
	Improvement of the information exchange system in the logistics system

Source: suggested by the author

Provisions for the implementation of data processing models are specialised APMs (automated workplaces), thanks to which analysts perform calculations of models for comparative assessment of the competitiveness of the logistics system, assessment of the ability to implement new technologies, integrated quantitative assessment of competitiveness, assessment of the effect of modernisation measures, coordination of modernisation projects, harmonisation of specialised social business processes with management social business processes, integration of management systems of specialised social business processes into the general management system, informatisation and automation of management business processes.

Automation is possible for each social business process, as shown in Table 2.

Table 2 - Areas of automation of social business process management and programs for their implementation

№	Direction of automation	Applicable program
1	Management: strategic management; economic security; legal support; Managerial Accounting; budgeting; informational security	"1C: for Ukraine", SAP R / 3 system management module.
2	Marketing and sales: management of marketing activities; PR; management of advertising activities; sales management; customer relationship management (CRM)	CRM systems - "Megaplan", "1C: Bitrix24", management of advertising activities - EFSOL: AMS Advertising management, "Sisyphus", site management (CMS) - Bitrix, UMI. CMS, NetCat, HostCMS, AMIRO.CMS, DataLife Engine (DLE), etc.
3	Logistics system.	Software products: "Kraft" systems, UVU, production module AVA ERP, VOGBIT, Sage, Super Warehouse ", " Warehouse and Realization ".
4	Production: management of production processes; social enterprise inventory management; management of material supplies; management of production equipment.	Software products: "Kraft" systems, UVU, production module AVA ERP, VOGBIT, Sage, Super Warehouse ", " Warehouse and Realization ".
5	Quality management: quality management system (QMS); quality control of manufactured products and production indicators; working with claims.	Indicators Administrator", "Finex: Quality Management", "Master: Quality Management", Wonderware MES Software / Quality, ProdX.
6	Personnel management: personnel selection; personnel training and development; personnel accounting; motivation and payment of work	"E-Staff Recruiter" from Datex Software, "1C: Salary and Personnel Management", Oracle / Personnel Management, "Pharaon", "Bos-kadrovyk".
7	Finance: accounting; Tax accounting; financial planning; management of settlements with clients; calculation of wages of company employees	"1C: Accounting", "1C: Salary", "AuditExpert", "Master of Financial Analysis", "Fingrand"
8	Organization of the company's activities: document management; secretariat	"1C: Document Flow", "E1 Euphrates" from Cognitive Technologies, "Master Doc" from Master Group, QPR 2014, Oren Text, MedOK
9	Complex automation	ERP

Source: systematised on the basis of [23]

Thus, the "island" automation of individual and social business processes sooner or later becomes ineffective, as attempts to combine several different automation systems into a single whole often become unsuccessful. When implementing the "island" approach, the goal of increasing the overall efficiency of the social enterprise is usually not set.

In contrast, a comprehensive social business automation system is a management system for all financial and economic activities of the company and provides operational, management and accounting as a whole.

The automated logistics systems management system should form a single information base built on a single ideology, covering organisational, programmatic, technological, methodical and other aspects.
The basis of the proposed information support for the logistics system consists of automated workplaces for analysts who process information flows necessary for making management decisions regarding its improvement. He is an analyst for assessing the social enterprise's competitiveness, for the modernisation of logistics and for strategic planning. All automated workplaces interact through databases, which include a model database, an unstructured database, and a structured database.
The database of models contains algorithms and models for data processing necessary for the implementation of complex logistics system mechanisms. Thanks to the presence of a separate base of models, the transparency of the decisions made is increased, the modernisation and improvement of models are facilitated, and the connection of new information support modules, which may be needed later, is simplified.
The database of unstructured data is a repository of knowledge, which contains facts about competitors' consumers with assessments of the reliability of these facts. This knowledge can be used for additional substantiation of management decisions, brainstorming, and forming alternatives to possible logistics strategies.
A structured database is a classic relational database that contains formalised data and is used by all enterprise information systems, from accounting programs to document management systems.
The lower level of the information support system of the logistics system is the sensors on the equipment, which collect primary information and transfer it to the automated process management system.
Direct interaction with the automated process management system is carried out by the employees of the technical department and the training and logistics service, who, according to their duties, must respond promptly to deviations from plans and monitor the process of implementing production plans. In addition to human control in the automated process management system, it is necessary to add the possibility of automated control of the performance of production tasks.
The commercial department, which uses services for representation in the global network, carries out the main interaction with counterparties in accordance with the developed information support for managing logistics systems. It's also responsible for feedback from product users. Thanks to contacts with counterparties, the commercial department can also receive data on competitors, which is necessary to compare the company's performance with similar indicators in the industry. The obtained data are further used in analytics to assess the competitiveness of the logistics system.
The second main automated workplace of information support is the automated workplace of the logistics system modernization analyst, which provides an opportunity to evaluate measures to improve technologies and equipment and build a modernisation plan.
An additional automated workplace of information support is an automated workplace of a strategic planning analyst. This analyst belongs to the forecasting and planning department. Specialists of the forecasting and planning department provide justification for the developed strategic decisions.
A separate component of the information support for the management of logistics systems is the electronic document management system, the implementation of which became possible thanks to the computerisation of most of the company's divisions, including production ones, which makes it possible to: increase the efficiency of decision-making; to ensure every adopted strategic management decision with a transparent justification and forecast of its consequences; reduce losses from emergency situations and negative effects of the external environment; ensure control of management and production processes; increase competitiveness.

Conclusions

The proposed information support for managing logistics systems, rooted in the principles of constructing regulatory, technical, and software components for controlling logistics flows, offers an opportunity to enhance the efficiency and accuracy of management decision-making and timely detection of deviations from planned logistics paths.
Consequently, the correct implementation of logistics systems using modern technologies positively impacts the efficiency of social enterprises. To bolster competitiveness, it is crucial to prioritise

improving logistics processes. With its complex technical and digital algorithms, artificial intelligence has significantly reshaped the approach to developing and operating the logistics industry. The capabilities of artificial intelligence simplify logistics companies' ability to plan service volumes, identify optimal supply chains, and address transportation challenges.

The primary focus of state regulation remains the balanced development of Ukraine's unified logistics system as a whole, coupled with enhancing regulatory and legal support for the overall development of logistics systems. This includes establishing a regulatory framework to oversee the quality of logistics services.

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