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THE IMPACT OF THE NATIONAL ECONOMY DIGITALIZATION ON THE EFFICIENCY OF THE LOGISTICS ACTIVITIES MANAGEMENT OF THE ENTERPRISE IN THE CONDITIONS OF INTENSIFYING INTERNATIONAL COMPETITION

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ABSTRACT

In the article, the main directions of the logistics activities digitalization in Ukraine are examined. The purpose of the study is to substantiate the impact of digitalization on the efficiency of the logistics activities management of enterprises in the conditions of intensifying international competition. To achieve the goal, the systematic approach was used, which allows to study the components of the logistics system as separate elements and their synergistic effect as a whole.

It was determined that for effective operation of transport and logistics companies, the presence of an appropriate level of digital support and the use of software products for the implementation of production operations by enterprises is necessary. It has been proven that the use of modern digital products allows enterprises to take advantage of a single digital global space in the logistics transportation sector. The state of the implementation of digital technologies at logistics enterprises, which are leaders of the industry in Ukraine, is analyzed.

The methodical support proposed in the work allows to determine the effectiveness of measures related to the digitalization of the enterprise's logistics activities. Based on the methodological support, the approval of which was carried out on the example of five enterprises of the logistics industry in Ukraine, the development level of the logistics activity of enterprises in the conditions of the production digitalization was established.

The conducted calculations showed that for successful activities in the logistics field and activities in the international market, enterprises should implement digital technologies to meet European standards for the relevant services provision. It has been proven that the strengthening of integration processes in the digital technologies sphere in logistics activities contributes to the development of 4PL and 5PL outsourcing, which require a quick exchange of information during the implementation of logistics operations.

Keywords: *Digitalization, Logistics Activity, National Economy, Management, Enterprise, International Competition, Logistics, Supply Chains*

1. INTRODUCTION

Today, almost all spheres of social life are covered by digitalization, which implies flexibility and adaptability to the processes caused by modern changes. Digitization is a new reality that requires adaptation to its requirements not so much in computers and gadgets, but in processes, models and transformations. Within the framework of global transformation, it foresees the emergence of new innovative solutions. Digitization promotes the emergence of new innovative solutions in various political, technological, educational, and economic spheres. Digitization of technological changes in supply chains in the transport and logistics sphere also fell under this influence. Recently, the sphere of logistics supplies has significantly developed in the intellectualization, automation and data analytics. In the pandemic conditions, such technologies began to be implemented at an even greater pace in the activities of the enterprises engaged in the goods transportation. However, despite such achievements, most companies are faced with customer expectations that exceed the innovative development of the transportation sector, thereby forcing companies to either adapt to new conditions or reduce their market segment.

Increasing pressure is observed from companies and customers in matters of increasing the speed of delivery while reducing the cost of services. If we compare the sector of logistics services with the banking sector or the field of telecommunications, we can conclude that it is significantly inferior to them in matters of digitalization of its activities. Most enterprises use ineffective methods of managing logistics chains in their activities, which leads to downtime of equipment or its inefficient use.

The relevance of the study is due to the fact that the modern development of information technologies makes it possible to introduce innovative developments in various spheres of social development and has a special relevance for the logistics sphere, since its digitalization ensures an increase in the efficiency of logistics systems.

The purpose of this study is to substantiate the impact of digitalization on the efficiency of the logistics activities management of enterprises in the conditions of intensifying international competition. The methodical support proposed in the work allows to determine the effectiveness of the measures related to the digitalization of the enterprise's logistics activities. The methodological support has been tested on the activities of enterprises in the logistics sector.

2. LITERATURE REVIEW

There is no doubt about the relevance of the study of the effectiveness of the logistics activities management of the enterprise, taking into account modern conditions of intensifying international competition, as well as the national economy digitalization, because domestic and foreign scientists continue to devote their scientific works to the specified areas of research.

The relevance of the research topic is confirmed by the presence of scientific articles by researches from different parts of the world, which are based on the issues of managing the logistics activities of enterprises, shown in Fig. 1. The first article on the specified topic was published in 2014 (according to the international Web of Science scientific metric database). Considering the dynamics of the number of articles devoted to the logistics activities management of enterprises taking into account processes of the digital economy development, the following data should be presented: 2022 – 3 articles, 2021 – 5 articles, 2020 – 5 articles, 2019 – 10 articles, 2018 – 1 article, 2017 – 2 articles, 2016 – 1 article, 2014 – 1 article. Analyzing the activities of scientists, the world centers of scientific research in the field of the logistics activities management of enterprises, according to the results of the analysis of the publications of the Web of Scientists database, are: Slovakia, Czech Republic, China, Germany, Poland, USA, Denmark and other.

Taking into account the available number of publications on the specified topic, there is a need for further research and in-depth study of the issues of the logistics activities management of enterprises in the conditions of intensifying international competition and taking into account the processes of the economy digitalization.

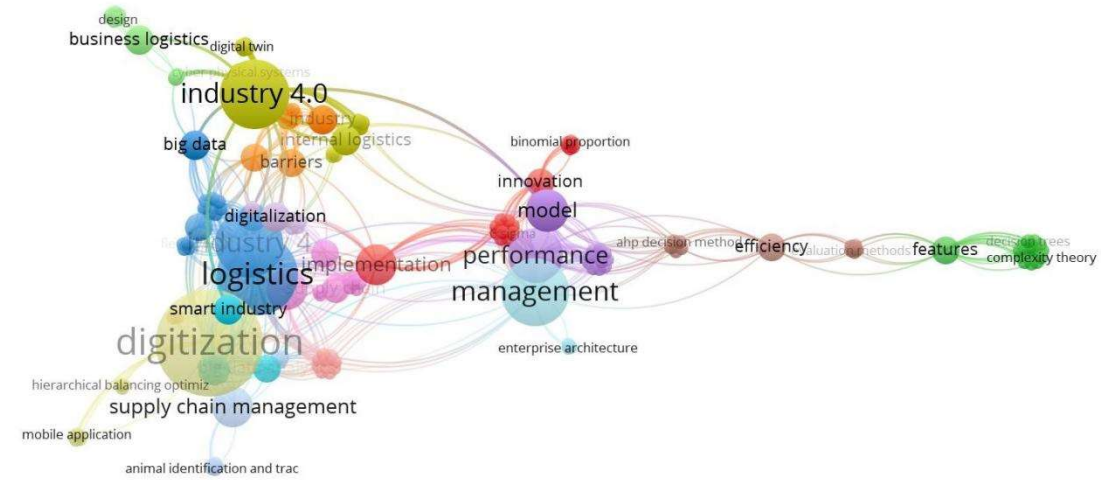

Figure 1: Graphic map of keywords in publications, in which titles the word "digititalization", "management", "enterprises", "logistics" is met

Source: compiled by the authors based on the analysis of the Web of Science database and using the tools of the VOSviewer program

Thus, the authors of the article [1] proposed scientific and methodological recommendations for the application of logistics management innovations, which are aimed at the design of the logistics system due to the improvement of the organizational structure of the enterprise as an element of the economic macro-environment. The authors proposed the approach based on the formation of the organizational structure of the enterprise according to the process-matrix principle and the creation of an effective logistics service of the enterprise.

Within the scope of the study [2], the scientists of the article analyzed methodological foundations of the internal environment analysis of the logistics activity. The authors researched the main methods of analyzing the external environment of the logistics activity of a trade enterprise, and also developed an algorithm for building a logistics strategy of a trade enterprise.

Scientists [3] are convinced that every enterprise has the opportunity to ensure its information and logistics activities at the expense of its own capabilities. The authors have developed a methodology for the indicator's synthesis of the economic efficiency of the outsourcing of direct and indirect information and logistics services for economic assessment of its effectiveness. As a conclusion, the authors note that the method will allow to fully evaluate the advantages of outsourcing in comparison with the option when they are implemented by the enterprise using its own capabilities.

Practical significance of the scientists' research [4] lies in the establishment of organizational and economic support for logistics systems of the machine-building complex. The authors proposed an algorithm for building an organizational and economic mechanism for providing a logistics system, taking into account the specifics of the machine-building complex.

Scientists [5] conducted research in the direction of supply chain management and analysis of the logistics place in the supply chain. The authors conducted a survey and personal interviews with professionals in Germany and Turkey involved in the supply chain. As a result of the study, scientists compared and evaluated logistics activities of German and Turkish companies in the green perspective context.

The main goal of the research [6] is the optimization of logistics costs, which is planned to be achieved through the calculation of logistics costs using the method of costing by activity; analysis and optimization of the warehouse system using the software analysis method, improvement of the distribution system using the Flexsim software, evaluation of the improved management strategy using the costing method by activity. It is proved that the proposed strategy is more rational and effective.

The authors of the study [7] compared the main reference models for the analysis of logistics activity and found the most suitable for use - the SCOR model, which defines the main indicators for evaluating the efficiency of logistics activity. Scientists proposed an algorithm for determining the

level of efficiency and effectiveness of logistics activities.

As a result of the study [8], the authors determined the advantages and disadvantages of practical measures to adapt the logistics system in the conditions of the activities diversification of the food industry enterprise. The scientists investigated the main reasons for the need to optimize the logistics system, among which the following were identified: negative trends at the enterprise, deterioration of the rations of its main activity; structural changes; influence of external factors; significant changes or adjustments to the company's strategy.

Within the scope of the research [9], the authors determined the external factors of the logistics activity of retail enterprises, substantiated their evaluation indicators, analyzed the volume and structure of the consumer demand, development of the logistics services market, efficiency of logistics activities and the competition state in the retail market. Scientists have diagnosed a decrease in the efficiency of logistics activities of retail trade enterprises and a high level of its dependence on environmental factors.

In the article [10], the authors proposed a basic model of logistics costs and activity-based costs, and activity-based cost management methods combined to facilitate its adaptation to modern logistics requirements. Scientists propose the use of ABC by interpreting the application of a third-party logistics enterprise, the effectiveness of logistics cost control, adaptation to the modern way of managing a logistics enterprise, and accurate calculation of logistics costs, providing a more effective basis and supporting decision-making by logistics enterprises have been proven.

The scientists [11] proposed the concept of supply chain modeling and investigated its advantages for the enterprise. In the article, the authors proposed simulation modeling methods to show how modeling methods effectively optimize the supply chain management.

The results of the research [12], devoted to the resource provision of innovation and investment strategies for the micro-economic systems modernization in the conditions of digitalization, as well as the methodological approach proposed by scientists [13] to the economic analysis and management of enterprises in the conditions of the economic systems transformation, are suitable for use in practice.

The results of the authors' research [14] demonstrate the peculiarities of modern trends in the economy digitalization in Ukraine and Poland at the national and regional levels. Scientists have determined the main reasons for Ukraine's lagging behind Poland and substantiated the possibilities of improving Ukraine's position through the implementation of state initiatives of a strategic and programmatic nature. The authors, taking into account the current trends in the digital economy development in both countries, have developed the proposals for state support for the mechanism activation of the accelerated economy digitalization of Ukraine.

It should be noted that the sufficiently high activity of publications in this direction once again substantiates the feasibility of conducting research in the direction of isolating the impact of digitalization on the effectiveness of managing the logistics activities of enterprises in the conditions of increasing international competitiveness using the methodology of a systematic approach, which has not been studied by other scientists before.

Despite significant achievements in this direction of research, the issue of the impact of the national economy digitalization on the efficiency of managing the logistics activities of the enterprise in the conditions of intensifying international competition requires further in-depth analysis.

3. METHODOLOGY

Today, the real-time supply chain management is effective, which allows tracking the conditions of transportation and helps to optimize deliveries. So, the companies that use the system of integrated supply chains work 20% more efficiently than their competitors. In recent years, warehouse operations have undergone significant innovative transformations due to the introduction of the GPS tracker system, which allows tracking the movement of goods and services based on cloud services. Some companies implement a robotics system, such as Boston Dynamics, Handle, which allow you to fully automate the process of warehouse operations and transport medium-sized items around the entire perimeter of the room, which significantly reduces the manual labor level. Today, the automated counter party search system and the digital twins technology are effective. This system is based on the ability to accurately forecast and prevent problems before they occur, which allows for more accurate and efficient forecasting of the enterprises development.

In logistics campaigns, the introduction of this technology will make it possible to apply the advantages of the transportation management digitalization. In the transportation system, it can be

used to collect and process data on packaging, labeling of goods and services to identify strengths and weaknesses, for further management to improve these operations. Based on this technology application, you can create 3D models of your centers, which allows you to optimize the change in equipment, planning and minimizing risks in the implementation of these operations. In logistics centers, the use of digital twin technology allows testing various scenarios of the technology change to improve the enterprise efficiency. Among innovative technologies in the logistics industry is the use of autonomous vehicles and unmanned devices.

For example, UPS invested in TuSimple, a company engaged in autonomous driving projects. The main goal of these companies, like Daimler and Tesla, is to use trucks of the fourth level of autonomy, which will be engaged in the delivery of goods without the help of human labor, which will significantly reduce the company's costs and increase the traffic safety. Digitization of logistics activities is implemented from the electronic document flow, which allows more effective analysis of large data sets, management of information flows of logistics transportation at all levels of management. The use of digitization for the purposes of the document management reduces the costs of processing relevant documents by 20-40%, which positively affects the implementation of operations.

To carry out logistics operations, companies use appropriate software that allows coordinating all participants of the transport and logistics chain in one place to create a communication space. The most popular applications of transport and logistics systems are:

- Enterprise Resource Planning (ERP), which allows you to plan enterprise resources;
- Transport Management System (TMS) – intended for transport management,
- Warehouse Management System (WMS) – a program designed for warehouse management;
- Customer Relationship Management (CRM) program, which is designed to manage relationships with suppliers (consumers);
- Radio Frequency Identification (RFID) – a software product designed for radio frequency identification based on the use of radio tags and others.

In the conditions of a pandemic and limited human participation in operations, with the help of the document flow digitalization, most companies managed to establish international transportation, which helped them maintain their competitive positions in the international arena.

Based on the digital signature on documents of international communication, it helps to reduce time spent at all stages of establishing relationships with clients. The creation of such a single digital space opens up new opportunities for companies in the logistics processes management. In the connection with the logistics chains expansion in enterprises for which logistics is not the main activity, it is more appropriate to outsource these processes to 3PL and 5PL providers. Today, five levels of logistics are distinguished: 1PL (First Party Logistics), 2PL (Second Party Logistics), 3PL (Three Party Logistics), 4PL (Four Party Logistics), 5PL (Five Party Logistics). Each level of the logistics system development is characterized by the digitalization level of these processes.

Thus, the 1PL level characterizes this type of logistics system in which all operations are carried out independently by the cargo owner on the basis of its own infrastructure, personnel, premises.

The second level of 2PL is characterized by the simplest form of outsourcing of logistics operations, in which a third-party specialized company undertakes transportation and technical management of warehouse stocks within the contract.

The third level characterizes a more advanced form of outsourcing, which involves the integration of all logistics services into a single system, which, in addition to the main functions, contributes to the intermediate storage of cargo, the design and development of information systems, the use of the services of various subcontractors, etc. Important for such a system is the availability of information and analytical support that promotes better interaction with clients.

On the basis of focusing on the quality of the services, and not only on the process, led to the development of the fourth level of outsourcing, which is characterized by the creation of such a company that accumulates the resources, technologies, innovations of its own company and other companies to create, design and support complex solutions for the formation of logistics networks and logistics chains.

The fifth level of logistics operations is characterized by the use of Internet logistics, which contributes to the provision of innovative network technologies aimed at managing logistics supply chains, including virtual enterprises. However, such technologies have not yet become widespread in Ukraine.

In Ukraine today, innovative developments and implementation of digital technologies contribute to the development of logistics companies in the international carrier market. In order to maintain competitiveness in the international market, domestic logistics companies need to more effectively use innovations in the digitalization field, because access to the international digital space allows expanding the customer segment in the international environment. Thus, the largest logistics companies in Ukraine KÜEHNE + NAGEL, DSV LOGISTICS, FM LOGISTICS UKRAINE, RABEN, EKOL UKRAINE implement advanced technologies in matters of the business digitalization. In 2021, the revenue of the companies amounted to KÜEHNE + NAGEL - 2032 thousand euros; DSV LOGISTICS - 9823 thousand euros; FM LOGISTICS Ukraine – 2146 thousand euros; RABEN – 1,923,000 euros; EKOL UKRAINE – 6160 thousand euros [15-18].

Today in the world, the development of the logistics industry can be considered a source of reliable and fast transportation of goods around the world from Ukraine to European countries, the East to America. This scale of the segment coverage is possible only due to the use of digital communication technologies and appropriate software. The development of digital technologies and their implementation in the activities of logistics enterprises helps to increase the innovative potential and their competitiveness level in the international market.

The assessment of the digitalization impact on the activities of enterprises is determined by the actual level of reliability indicators of the logistics system of supply, production, transportation, sales and storage. If the calculated coefficients of the specified indicators are greater than one, this indicates satisfactory operation of enterprises. The indicators are determined on the basis of a multi-factorial correlation-regression analysis between the gross profit and the logistics system of production, supply, transportation, sales and warehousing. The multiple regression equation will look like this:

$$Y=a_0+a_1x_1+ a_2x_2 + a_3x_3 + a_nx_n \quad (1)$$

where x1, x2, x3, xn – factors that affect the resulting indicator;

a1, a2, a3, an – regression coefficients, which characterize the degree of influence of factors on the resulting indicator.

To calculate the overall efficiency of the logistics system of development based on the digitalization implementation, it is advisable to single out five components, which will be evaluated.

Thus, it is proposed to single out production process systems in logistics activities, which consist of production, supply, transportation, sales and storage. The given methodical approach allows you to calculate the relevant indicators for all enterprises in the logistics industry, identify weaknesses by carrying out activities, and develop appropriate measures to eliminate them or minimize their impact.

To determine the efficiency ratio of the logistics supply system, we use the formula:

$$C_{lss} = \frac{P_g}{\sum C_{ss}} \quad (2)$$

where P_g – gross profit of the enterprise;

C_{ss} – amount of logistics costs of the supply sector.

The coefficient of efficiency of the production logistics system is determined by:

$$C_{lsp} = \frac{P_g}{\sum C_{lspa}} \quad (3)$$

where P_g – gross profit of the enterprise;

C_{lspa} – amount of logistics costs of the production area.

The efficiency coefficient of the logistic transportation system is calculated using the formula:

$$C_{lts} = \frac{P_g}{\sum C_{tr}} \quad (4)$$

where P_g – gross profit of the enterprise;

C_{tr} – amount of logistics costs in transportation.

The efficiency coefficient of the logistics sales system can be found using the following formula:

$$C_{lsals} = \frac{P_g}{\sum C_{sa}} \quad (5)$$

where P_g – gross profit of the enterprise;

C_{sa} – amount of logistics costs of the sales area.

The efficiency coefficient of the logistic storage system is found according to the formula:

$$C_{lsstor} = \frac{P_g}{\sum C_{lsw}} \quad (6)$$

where P_g – gross profit of the enterprise;

C_{lsw} – amount of logistics costs of the warehousing sector.

A comprehensive indicator of the efficiency of the logistics system of production, taking into account the digitalization impact, is proposed to be defined as follows:

$$F_{lsp} = \sqrt[5]{C_{rlss} \cdot C_{pls} \cdot C_{lstr} \cdot C_{lsals} \cdot C_{lstor}} \quad (7)$$

where C_{rlss} – efficiency ratio of the logistics supply system;

C_{pls} – efficiency factor of the production logistics system;

C_{lstr} – efficiency factor of the logistics system of transportation;

C_{lsals} – efficiency factor of the logistic sales system;

C_{lstor} – efficiency factor of the logistic storage system.

Calculation of the effectiveness of the innovative development of the components of the production process, taking into account digitalization, allows us to analyze the extent to which enterprises effectively implement developments in their activities. Since the enterprises under study carry out their activities in many countries, the use of digital technologies helps to increase the level of their competitiveness in the international arena. Thus, according to the data of enterprises, relevant indicators were calculated for the logistics activities development in the conditions of digitalization of the global economic space.

4. RESULTS

Based on the proposed methodological support for determining the digitalization impact on the logistics activities of enterprises in the conditions of intensifying international competition, it was tested on the five largest logistics companies operating in the territory of Ukraine. The main five leaders of the logistics services market include the companies KÜEHNE + NAGEL, DSV LOGISTICS, FM LOGISTICS Ukraine, RABEN, EKOL UKRAINE, which operate both in the territory of Ukraine and in the international market.

It is appropriate to note that the justification of the application of the system approach allows the authors to use a multifactor model of correlation-regression analysis to assess the impact of digitalization on the efficiency of logistics enterprises. The main indicator for modeling the effectiveness of the implementation of digital technologies by enterprises in the logistics sector is the gross profit of enterprises.

The main indicators of the enterprise activity are shown in Table 1. The impact of the digital economy development on the activities of logistics enterprises and the transportation is of great importance, since all large enterprises carry out their activities outside the country, thus maintaining competitive positions, and access to the international transportation market is impossible without application of digital technologies, unified databases and software. There are many types of software products for transport companies that are integrated with European countries, which simplifies the formation of logistics chains, allows the cooperation of cargoes of domestic enterprises with foreign companies, which affects the international cooperation development and increases the segment of services provided, thereby affecting the company's profit.

Table 1: Output data of the logistics activities management of enterprises.

Indicator	Year	KÜEHNE + NAGEL	DSV LOGISTICS	FM LOGISTICS UKRAINE	RABEN	EKOL UKRAINE
Gross profit, thousands of euros	2020	788	7252	1912	1611	5218
	2021	2032	9823	2146	1923	6160
Logistics costs of the supply system, thousands of euros	2020	280	423	620	450	1200
	2021	310	670	860	630	1650
Logistics costs of the production system, thousands of euros	2020	520	1020	1632	890	1310
	2021	640	2100	1862	1620	2010
Logistics costs of the transportation system, thousands of euros	2020	230	860	456	320	650
	2021	320	936	841	489	750
Logistics costs of the distribution system, thousands of euros	2020	123	350	410	360	452
	2021	209	510	641	530	680
Logistics costs of the storage system, thousands of euros	2020	101	300	320	420	630
	2021	132	420	401	360	500

Source: created by the authors on the basis of enterprise data [15-19]

Determination of the digitalization impact on the results of logistics activities was carried out based on the application of correlation-regression models. For EKOL UKRAINE, the multiple regression equation looks like this:

$$Y = 6160 + 0{,}064x1 + 0{,}556x2 + 0{,}288x3 + + 0{,}325x4 + 0{,}479x5. \quad (8)$$

Correlation-regression equations for other enterprises were carried out by analogy. It was established that the overall determination coefficient R2 = 0.62, which characterizes the presence of dependence.

On the basis of the data of the enterprise's activities and the introduction of digital technologies in the logistics sphere development, the corresponding coefficients were calculated for each investigated enterprise. The results of the calculations are given in Table 2 and Fig. 2-3.

Table 2: Calculation of performance indicators of logistics systems.

Name of enterprises; indicator	Year	Efficiency coefficient of the logistic supply system	Efficiency coefficient of the logistics system of production	Efficiency coefficient of the logistics system of transportation	Efficiency coefficient of the logistic sales system	Efficiency coefficient of the logistic storage system
KÜEHNE + NAGEL	2020	2,814	1,515	3,426	6,407	7,802
	2021	6,555	3,175	6,350	9,722	15,394
DSV LOGISTICS	2020	17,144	7,110	7,110	20,720	24,173
	2021	14,661	4,678	10,495	10,495	23,388
FM LOGISTICS УКРАЇНА	2020	3,084	1,172	4,193	4,663	5,975
	2021	2,495	1,153	2,552	3,348	5,352
RABEN	2020	3,580	1,810	5,034	4,475	3,836
	2021	3,052	1,187	3,933	3,628	5,342
EKOL UKRAINE	2020	4,348	3,983	3,983	11,544	8,283
	2021	3,733	3,065	8,213	9,059	12,320

Source: created by the authors on the basis of enterprise data [15-19]

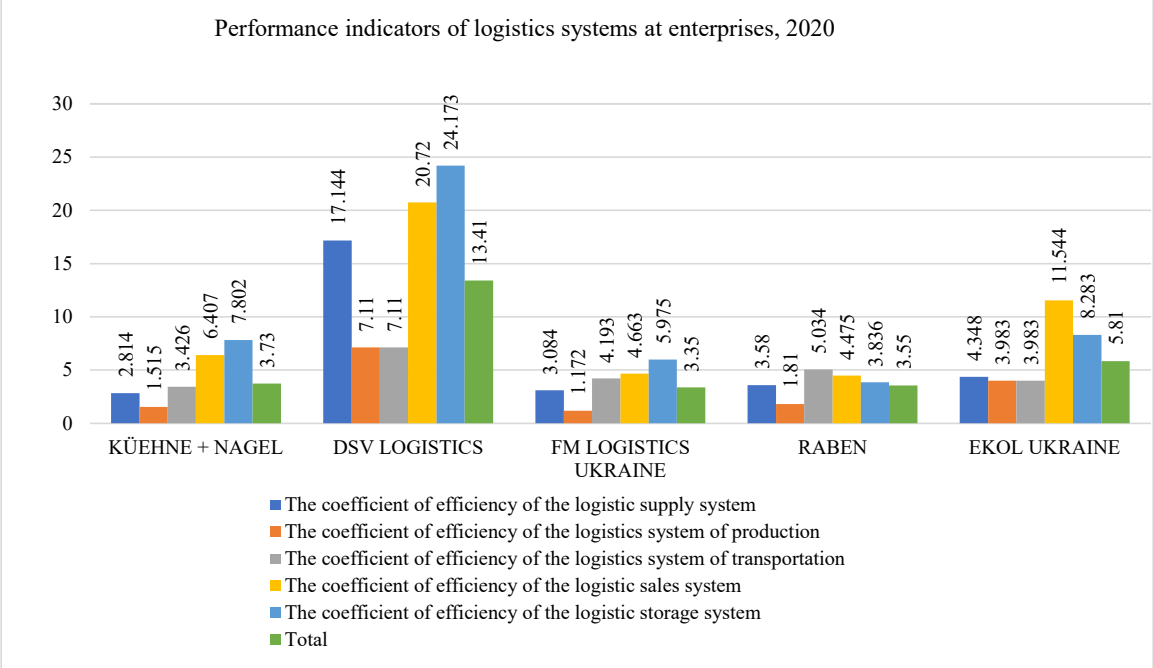

Figure 2: Performance indicators of logistics systems at enterprises, 2020

Source: created by the authors on the basis of enterprise data [15-19]

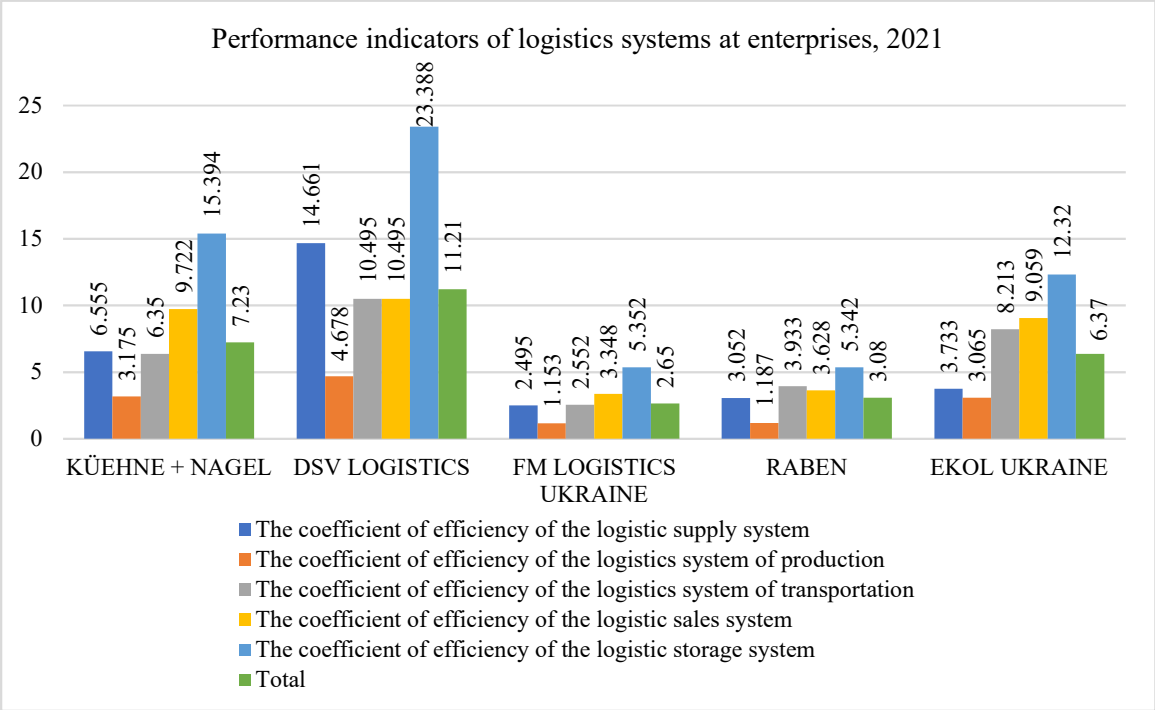

Figure 3: Performance indicators of logistics systems at enterprises, 2021

Source: created by the authors on the basis of enterprise data [15-19]

Calculation of the comprehensive indicator of the logistics systems efficiency for the studied enterprises:

KÜEHNE + NAGEL:

$$F_{in2020} = \sqrt[5]{2.81 \cdot 1.51 \cdot 3.42 \cdot 6.4 \cdot 7.8} = 3.73$$

$$F_{in2021} = \sqrt[5]{6.55 \cdot 3.17 \cdot 6.35 \cdot 9.72 \cdot 15.39} = 7.23$$

DSV LOGISTICS:

$$F_{in2020} = \sqrt[5]{17.14 \cdot 7.11 \cdot 7.11 \cdot 20.72 \cdot 24.17} = 13.41$$

$$F_{in2021} = \sqrt[5]{14.66 \cdot 4.67 \cdot 10.49 \cdot 10.49 \cdot 23.38} = 11.21$$

FM LOGISTICS UKRAINE:

$$F_{in2020} = \sqrt[5]{3.08 \cdot 1.17 \cdot 4.19 \cdot 4.66 \cdot 5.97} = 3.35$$

$$F_{in2021} = \sqrt[5]{2.49 \cdot 1.15 \cdot 2.55 \cdot 3.34 \cdot 5.32} = 2.65$$

RABEN:

$$F_{in2020} = \sqrt[5]{3.58 \cdot 1.81 \cdot 5.03 \cdot 4.47 \cdot 3.83} = 3.55$$

$$F_{in2021} = \sqrt[5]{3.05 \cdot 1.18 \cdot 3.93 \cdot 3.62 \cdot 5.34} = 3.08$$

EKOL UKRAINE:

$$F_{in2020} = \sqrt[5]{4.34 \cdot 3.98 \cdot 3.98 \cdot 11.54 \cdot 8.28} = 5.81$$

$$F_{in2021} = \sqrt[5]{3.73 \cdot 3.06 \cdot 8.21 \cdot 9.05 \cdot 12.32} = 6.37$$

On the basis of the conducted data, it can be argued that the digital technologies development both on a global and national scale has an impact on the logistics enterprises activities in the direction of encouraging them to intensify the implementation of innovative processes in their activities. Because without access to and compliance with the digitalization level of foreign companies, domestic logistics enterprises will not be able to fully carry out their activities and ensure the appropriate level of their competitiveness. All the studied enterprises implement digital technologies in their activities, on the basis of which the development of their activities takes place, the consumer segment and the competitiveness level both at the national and international level are formed (Fig. 4).

The strengthening of integration processes in the digital technologies field in logistics activities contributes to the outsourcing development, such as 4PL and 5PL, which require a quick exchange of information during the implementation of logistics operations. In this case, the transport and logistics system is a complex system that combines various enterprises or areas of transportation (water transport, rail, aviation, etc.) in a single information field. The formation of new integrated logistics systems is based precisely on the implementation of digital technologies, which allows enterprises to more effectively carry out their activities in the international field.

The main task in integrated logistics is perfect organization of multi-modal transportation, implementation of the door-to-door system.

Implementation of a complete local transport and logistics network based on effective management of the entire complex of transportation of goods and services. Based on the application of artificial intelligence, acceleration of the processes of the logistics operations optimization, the formation of logistics supply chains, simplifies the procedure for concluding contracts, improving the control procedure, the optimal choice of transportation, which in general reduces the risks of operations.

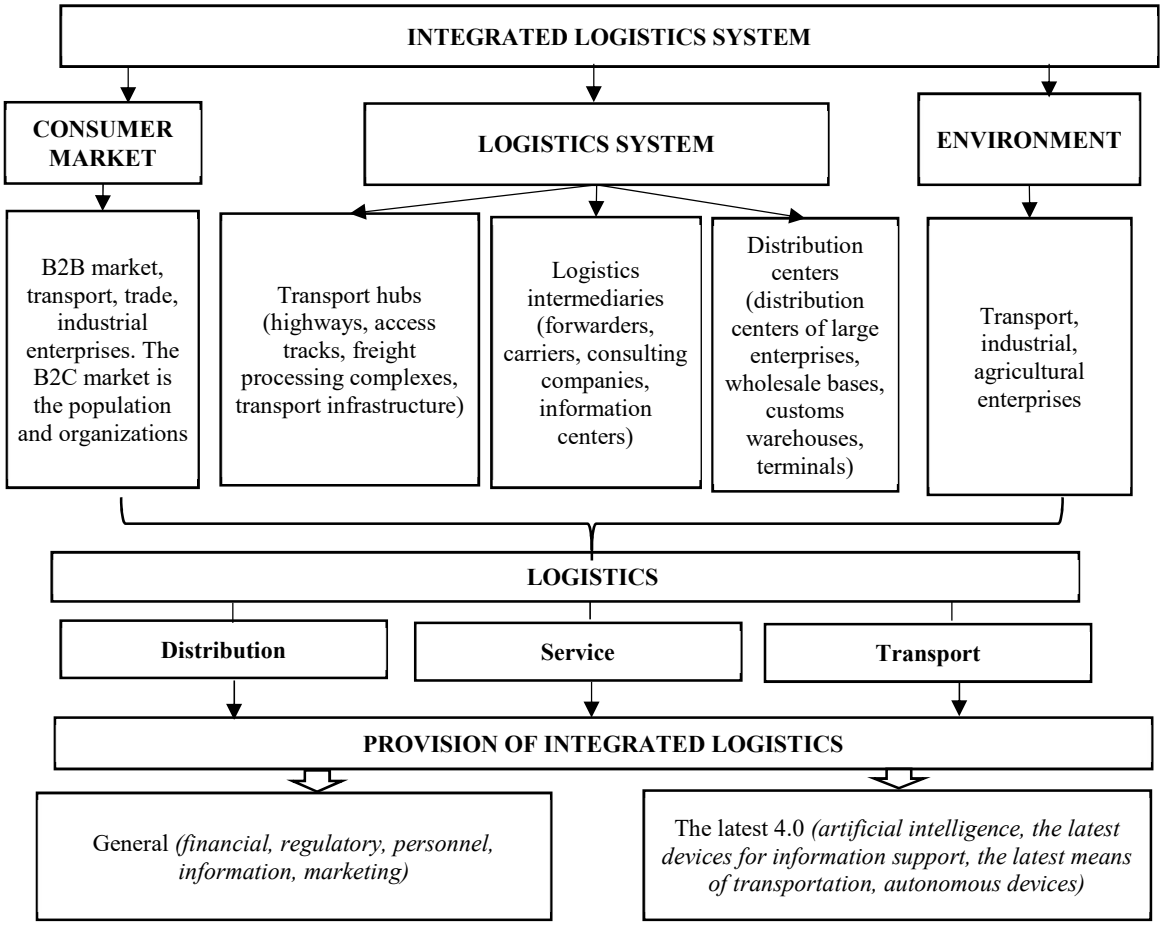

Figure 4: Integrated logistics structure in the conditions of the national economy digitalization
Source: constructed by the authors

A significant advantage of the logistics operations intellectualization is the optimization of routes with the saving of energy resources, increasing the accuracy of forecasting of transportation routing. Based on the establishment of constant communication between different types of transport based on remote control of processes, in some cases autonomously based on the application of intelligent sensors. Today, in Ukraine, such systems are at the stage of development and implementation at some enterprises, since such technologies require funds investment. The implementation of such systems at logistics enterprises should include automated control centers, intelligent analysis and data processing systems, technical equipment, elements of the trunk intelligent multi-modal logistics system. Therefore, such systems should be based on open system software products.

4. CONCLUSIONS

The scientific novelty of the study consists in the improvement of methodological support using a systematic approach to justifying the digitalizatio impact on the efficiency of managing logistics activities of enterprises in the conditions of intensifying international competition, which is based on a correlation-regression analysis of calculations of the performance indicators of logistics systems taking into account the coefficients of supply, production, transportation, sales and storage.

Based on the conducted research on the impact of the national economy digitalization on the logistics activities of enterprises, it is possible to conclude that the modern development of digital technologies requires enterprises to introduce intelligent technologies into their activities. The introduction of such technologies will allow enterprises to strengthen their competitiveness on the international market, expand the capabilities of logistics supply chains, increase the security level of information and analytical support for the activities of logistics enterprises, increase the electronic document flow, which contributes to reducing the time and costs of changing vehicles during transportation. Digitization of logistics activities will make it possible to more optimally and accurately make forecasts and form plans for the enterprise development, increase the efficiency of integrated supply chains, improve monitoring of the current situation in all areas of the enterprise activity at each stage of the production process. The use of a single information base will allow enterprises to conduct more in-depth analytical studies of competitors, monitoring the situation on the international market of logistics transportation. Digital technologies make it possible to speed up the process of solving a complex of interrelated problems, namely, the organization of research and development, modernization of production, and improvement of personnel qualifications. The need to create an integrated logistics system that would meet modern world requirements for the provision of logistics transportation services is substantiated.

The methodology of the system approach and the application of correlation-regression analysis made it possible to evaluate the impact of digitalization on the activities of enterprises (using multifactor modeling in relation to the gross profit of the enterprises selected for approval, namely KÜEHNE + NAGEL, DSV LOGISTICS, FM LOGISTICS Ukraine, RABEN, EKOL UKRAINE), which is determined by the actual level of reliability indicators of the logistics system of supply, production, transportation, sales and storage.

The assessment of the impact of digitalization on the activities of enterprises in accordance with the logistics system, which includes supply, production, transportation, sales and warehousing, enabled the authors of the study to justify the need to create an integrated logistics system that would meet modern global requirements for the provision of services in logistics transportation The use of an integrated logistics system will contribute to the practical implementation of the introduction of multimodal transportation and ensuring the operation of a complete local transport and logistics network based on the effective management of the entire logistics complex of transportation of goods and services.

Access to various types of transport in real time allows you to establish their condition and reduce the corresponding risks during operations. Therefore, modern development of the logistics industry must take into account not only the need for the enterprises adaptation to EU standards in matters of compliance with technical conditions, management principles, the introduction of innovative technologies for the formation of a new effective management system of logistics enterprises.

Further research in the area of the influence of digitalization on the management of logistics activities of enterprises requires substantiation of promising directions for the implementation of digital services, as well as the development of directions for leveling obstacles to the implementation of digital technologies in the logistics sector and supply chain management.

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