MINISTRY OF EDUCATION AND SCIENCE OF UKRAINE
KYIV NATIONAL UNIVERSITY
CONSTRUCTION AND ARCHITECTURE

Department of construction management

I approve
Head of the department
Doctor of Economics, Prof. Ryzhakov. .
"__" ___________2023

EXPLANATORY NOTE

to the attestation graduation work
to obtain a master's degree
on the subject:

"Updating the operational management of construction enterprises based on modern reengineering approaches ".

Performed by:
student **Xy Jin**
Discipline 07 "Management and administration"
Specialty 073"Management"
Specialization Management of organizations and administration
Head Doctor of Economics, Professor. Ryzhakova G.M.

Reviewer ________________________

Kyiv 2024

MINISTRY OF EDUCATION AND SCIENCE OF UKRAINE

KYIV NATIONAL UNIVERSITY OF CONSTRUCTION AND ARCHITECTURE

Constructional faculty
Department of construction management
Educational and qualification level "Master"
Specialty 073 "Management"

"I APPROVE"

Dean of the faculty
Ph.D., Professor G.M. Ivanchenko

"____"___________2024

T A S K
for the student's graduation thesis
Xy Jin

The topic of the work: **" Updating the operational management of construction enterprises based on modern reengineering approaches"** and the head of the attestation final work Doctor of Economics, Professor. Ryzhakova G.M confirmed by the order of KNUBA from "___" __________2024 No.____

2. Deadline for submission of work by the student________________________________

3. Initial data for work:

Scientific works of domestic and foreign scientists on issues related tomodern models and approaches of reengineering of construction enterprises; scientific and methodological principles of reengineering of construction enterprises and initial data regarding the construction project management system and the results of the activities of the project's stakeholder enterprises; economic and management characteristics of the project in residential construction

4. The content of the settlement and explanatory note - a list of issues that need to be worked out - (consisting of 3 sections):

Chapter 1 –Theoretical and methodological principles of reengineering as a tool for improving the management system of construction projects and organizations implementing them.

Chapter 2 –Applicationmodern scientific and applied tools of reengineering to the practice of management in construction (on the example of the "Lincoln-2" housing project in Lviv).

Chapter 3-Evaluation of the economic results of the implementation of the investment project using applied products of reengineering in construction.

List of graphic material:15-17 slides*with a display of research on all sections of the explanatory note to the thesis.*

Consultants of sections of AVR

Section	Surname, initials and position of the consultant	Signature, date	
		task published	task accepted
Chapter 1	Prof. Chuprina Yu.A.		
Section 2	Prof. Pokolenko V.O.		
Section 3	**Prof. Malikhina O.M.**		
conclusions, literature, graphic part	**Prof. Malikhina O.M.**		

7. CALENDAR PLAN

No s/p	The name of the stage of the graduation test robots (AVR)	Deadlines Execution of stages of AVR	Note
1	The student's choice of the AVR topic, submission of an application to the department and coordination with the academic supervisor		
2	Systematization of materials and preparation of initial data for AVR		
3	Approval of the content (plan) of the AVR, preparation of an individual task		
4	Preparation of introduction and 1 section of AVR		
5	Preparation of the II section of AVR		
6	Preparation of Section III of the AVR, conclusions and a list of used sources		
7	Submission of the completed AVR by the student to the academic supervisor		
8	Completion of qualifying graduation papers to check for the absence of textual borrowings		
9	Completion of the work, decision-making by the department on the admission of AVR to the defense at AEK		
10	Preparation of the presentation (development of options for presenting the content of the research carried out in the AVR on the sheets of the graphic part) and reports for the defense of the AVR. Agreement with the scientific supervisor.		
11	Final design and review of the work		
12	Preliminary defense of AVR at the department and its approval by the head of the department		
13	Submission of AVR to AEK		
14	Defense of AVR at AEK and awarding graduates with a master's degree		

8. Issue date of assignment "___"_________2024

Student _____________/ Xy Jin /

Head of work _______________/ Ryzhakova G.M /

Head of the department of management in construction ___________/ Ryzhakova H.M./

<table>
<tr><td colspan="2">SUMMARY (summary)
to the student's attestation graduation thesis:</td><td colspan="2">Xy Jin</td></tr>
<tr><td>ZVO</td><td colspan="3">Kyiv National University of Construction and Architecture</td></tr>
<tr><td>Topic</td><td colspan="3">" Updating the operational management of construction enterprises based on modern reengineering approaches"</td></tr>
<tr><td>Educational level</td><td colspan="3">MASTER's degree in the educational and professional study program</td></tr>
<tr><td>Faculty</td><td colspan="3">Constructional</td></tr>
<tr><td>Chair</td><td colspan="3">Management in construction</td></tr>
<tr><td>Specialty</td><td colspan="3">Management</td></tr>
<tr><td>Specialization</td><td colspan="3">Management of organizations and administration, 073.Man-23</td></tr>
<tr><td>Head</td><td colspan="3">Doctor of Economics, Professor. Ryzhakova G.M.</td></tr>
<tr><td rowspan="2">Scope of work:</td><td>explanatory note, p.</td><td>sections</td><td>Visual and graphic part (A4 format sheets)</td></tr>
<tr><td>139 (with literature and appendices)</td><td>3</td><td>19</td></tr>
<tr><td>Chapter 1.Theoretical and methodological principles of reengineering as a tool for improving the management system of construction projects and organizations implementing them</td><td colspan="3">The first section of the work reflects the elaboration of the basic definitions of the study and the theoretical and methodological principles of reengineering. Based on the development of scientific and applied research by specialists of the departments of management in construction, it was determined thatthe basic and systemic means of exiting contracting enterprises is a radical or partial transformation (modernization) of the enterprise's operating system and the system and structure of the administration of its activities operating at the enterprise - through reengineering.</td></tr>
<tr><td>Section 2.Applicationmodern scientific and applied tools of reengineering to the practice of management in construction (on the example of the "Lincoln-2" housing project in Lviv).</td><td colspan="3">The second chapter reflects the application of scientific and applied models of reengineering of construction projects and construction enterprises to the needs of the economic and managerial justification of the project of construction and sale of apartments in the residential complex "Lincoln-2" in the city of Lviv.</td></tr>
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Section 3.Evaluation of the economic results of the implementation of the investment project using applied products of reengineering in construction.	*In the third section of the thesis, it is reflected*justification of the decisions of the project of construction and sale of housing "Lincoln-2", implemented by the development company M7, and determinedindicators of its investment attractiveness. With the estimated cost of the project 70 million 355 thousand hryvnias. and net revenues of 102 million 418 thousand hryvnias. the net income of the project is 26 million 047 thousand hryvnias. Using the difference in the flows of net income and investments, discounted at the beginning of the project cycle at a discount rate of 5%/month, the main indicator of the effectiveness of this project was obtained - net combined (discounted) income, which amounted to 26 million 588 thousand hryvnias. The high rates of apartment sales fully ensure the quick payback of the project, according to the NPV schedule, the payback period is 6 months. The project profitability index reaches a maximum of +1.47 on the 9th month of the project cycle, and at the end of the project cycle (17th month) is 1.44.
Conclusions on the work:	the conducted studies revealed the advantages of applying a reengineering approach - using modern analytical decision-making tools - as an effective means of the system of preparation and management of construction projects and a means of successful transformations of subcontractors that implement these projects into life
Key words*: reengineering, construction enterprise, construction enterprise management, construction enterprise reengineering, construction enterprise reengineering project* **Keywords:** reengineering, construction enterprise, construction enterprise management, construction enterprise reengineering, construction enterprise reengineering project	

Compiler: ________________ /___ Xy Jin ___/

Head: _________________/__ *Ryzhakova G.M.__/*
"_____" __________2024

INTRODUCTION

Relevance of the topic. In modern conditions characterized by a gradual reorientation of foreign trade relations in the direction of integration of the national economy into the European environment, the issues of evaluating the effectiveness of logistics management at all levels are becoming more and more urgent. The confirmation of this fact is the increase in the volume of goods flows between Ukraine and European countries, which require high-quality logistics service, which is an important factor in the growth of competitiveness of both the national economy and domestic product manufacturers.

The main strategic priorities of the national economy at the current stage of development are gradual integration into pan-European systems, setting up multilateral cooperation with EU countries and increasing the volume of international trade in goods and services. In this regard, Ukraine faces new challenges and complex tasks related to the possibilities of effective adaptation of economic systems to new market conditions of management and their transformation in accordance with high economic, social and environmental standards of functioning.

The works of such scientists as I.V. Pozanska, V.V. Braginskyi, I.O. Irtischeva, M.I. Stegnei and I.M. Zavhorodniy are devoted to the study of logistics management issues. and many other domestic scientists. The problems of the European integration direction of the development of logistics are highlighted in the works of: Ovchar P.A., Kuzmenko A.V., Fedyai N.O. etc.

However, various studies of the theoretical, methodological and applied nature of the logistics management transformation process require further development and systematization. Taking into account the achievements of previous studies, the theoretical and applied aspects of interregional asymmetries in the development of transport and logistics remain insufficiently covered.

activities in Ukraine and strategic management of the national transport and logistics system in the context of the implementation of the European integration strategy. The relevance of these problems led to the choice of the research topic, its purpose and task.

SECTION 1
THEORETICAL AND METHODOLOGICAL BASIS OF THE FORMATION OF LOGISTICS MANAGEMENT

1.1. Logistic management: essence, value, functions, features of development and foreign experience

In the 20th century, logistics management was based on manual labor, the main task of which was to manually load material onto a truck for transportation. The main function performed by managers was control over the performance of assigned work. In the early days of logistics management automation, companies were forced to perform manual checks to make sure everything was processed correctly. There were no high hopes for the computerized systems of that time, because the programs were new, and companies did not want to trust the information obtained from them. There was concern that if anything went wrong, the customer would receive either the wrong product or at the wrong time. There was less competition, but more attention was paid to the needs of customers.

In the late 20th century, most companies began to rely on automated systems to fulfill orders for the supply chain management function. But the problem is that the systems were not reliable enough for companies, forcing them to create backup systems. The reasons for this were various: power outages, or server failure during critical operations, forcing personnel to lose all unsaved data.

The problem of transformation of interregional trade is also becoming relevant. The changes consist in the fact that, on the one hand, enterprises enter into interregional trade relations - as free, independent subjects of acts of purchase and sale; and on the other hand, these enterprises cannot be considered isolated from each other. Their activities are now evaluated in the context of the effective functioning of the entire supply chain. Such a chain is able to keep different enterprises, regions and countries in a single connection. In the foreground, a new commercial approach is asserted, when profit is generated as a result of the joint efforts of all partners of the logistics chain. The principle "my profit is your profit" becomes the guiding idea of business, and managers in the field of logistics act as leaders of this principle.

Organizational support of logistics management in world practice at different historical stages is carried out in different forms. Three historical stages in the development of organizational support for logistics management can be distinguished (table 1.1).

Table 1.1

The main stages of development of logistics management

Stage period	Characteristic
The first stage (1950-1960)	is characterized by fragmentary use of logistics management ideas. At this stage, the allocation of logistics functions, the control and analysis of costs associated with the implementation of these functions, were for the first time accompanied by attempts to consolidate the logistics management
The second stage (early 1970s - mid-1980s)	characterized by the appearance of the first line and headquarters organizational structures. At this time, the concept of general logistics costs was born, the first logistics departments at enterprises were created, the logistics administration of the projected logistics systems
The third stage (mid-1980s - early 1990s)	related to the integration of functional areas of logistics management and the reorientation of management from functions to processes. Integrated logistics managers appear, project managers are formed, matrix and program-oriented organizational structures.

Source:built by the author according to data [1]

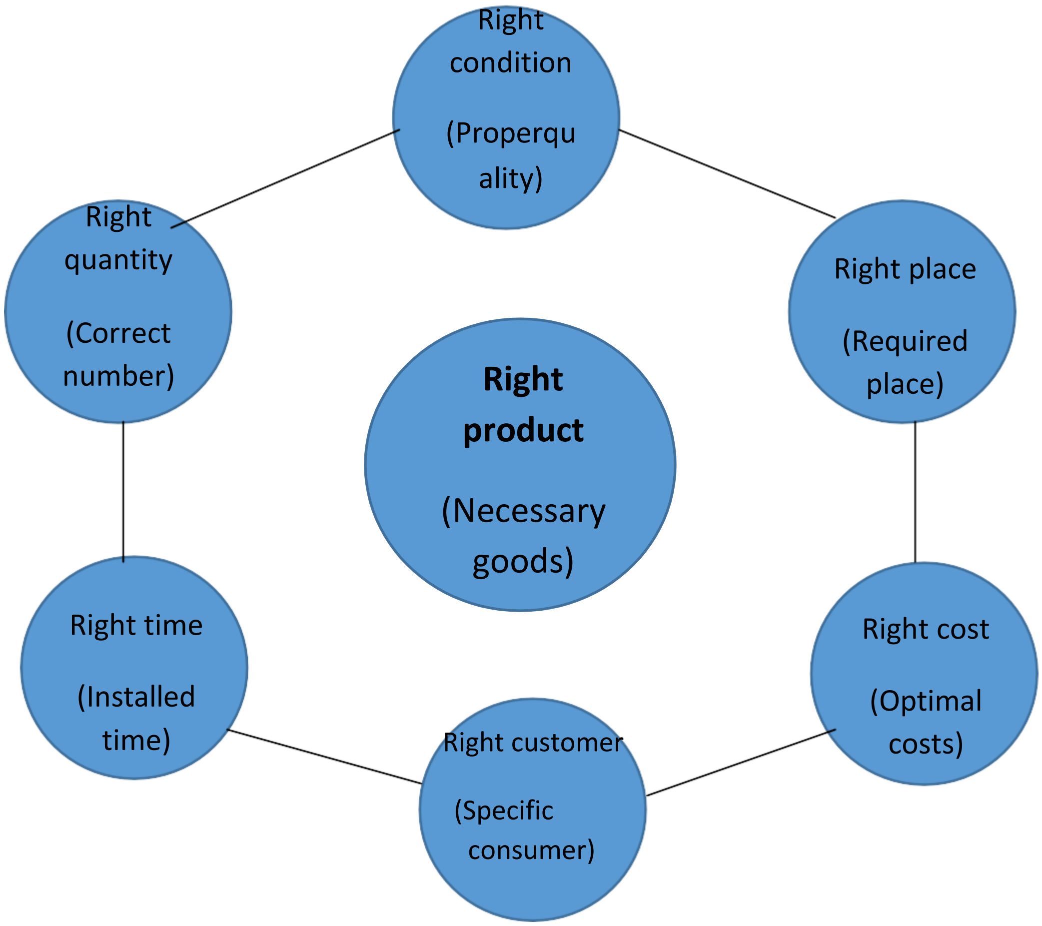
Each of the stages of the evolution of the theory and practice of logistics management is characterized by numerous attempts by scientists and practitioners of different countries to structure and differentiate its main task in relation to various organizational and functional areas of business [3, 4, 6].

Modern researchers distinguish the following directions of management: innovative, strategic, production, environmental, financial, investment, information, risk management, which consider separate aspects of management. Using modern logistics approaches, logistics management, to increase the efficiency of the company's activities, allows you to use the methods and tools of the listed areas in total [5, 7, 8]

When translating foreign economic literature into Ukrainian, the phrase "logistics management" is often interpreted as logistics management. For example, the textbook on logistics management "Logistical Management: The Integrated Supply Chain Process is known in Ukraine under the name "Logistics: an integrated supply chain". That is, an English word "management" is excluded from the title of the book. The translators probably assumed that logistics is already flow management. The analysis of the economic literature on logistics shows that there is no unified approach to the issue of applying these terms in Ukrainian theory and practice. Strictly speaking, a phrase "logistics management" can be recognized as not entirely correct - due to the fact that the very definition of the "logistics" category, as a rule, is related to the management of material and related flows. As a result, it turns out "management of management" [12, 13, 14].

Logistics is often considered as a related function. This means that logistics is not limited to a specific area or department, but affects all sectors within the enterprise. The enterprise consists of procurement, production and sales. Accordingly, they have the task of delivery, creation of products and sales [2]. And in each sector it is necessary to fulfill the so-called rule "R's family": "ensuring the availability of the right product, in the right quantity and in the right condition, at the right place, at the right time, for the right customer, at the right cost" goods in the right quantity and quality in the right place at the set time for the specified consumer with minimal costs) (Fig. 1.2.).

Transport tasks of assembly, transshipment, storage and transportation are obviously assigned to the logistics and warehouse department. Logistics is the control of flows of goods and information. Raw materials are purchased by the company, and a combination of production factors (technical equipment, materials and performers / labor force) produces finished products that leave the company and are further sold.



Rice. 1.2. Interconnection of ensuring the availability of the necessary goods

Source: built by the author based on data [2]

The example of the company's work shows that logistics is not limited only to the logistics department. Just as raw materials make their way from receipt to production and sale of goods, the flow of information through the company must be ready at the right time.

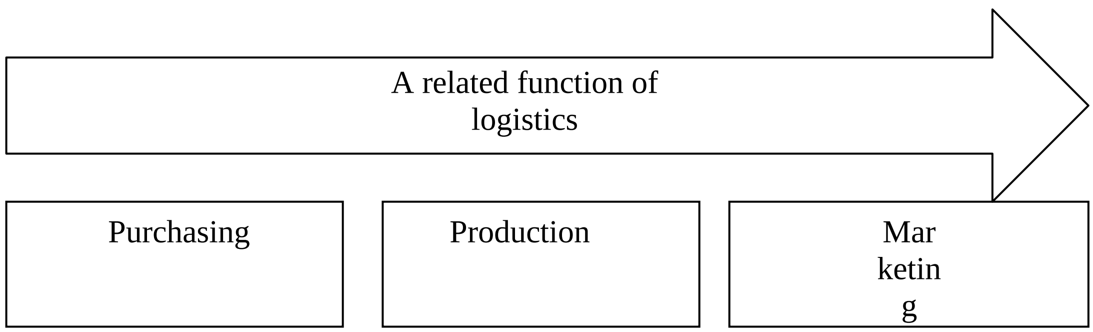
Examples of logistics activities in various areas [16,17,18]:

Purchasing - finding the optimal volume of the order, at which costs for transportation and storage are minimal.

Production find the optimal batch size to ensure profitability.

Warehousing determine the insurance stock to ensure the reliability of supplies.

Other departments of the company usually do not deal with goods. They are related to information logistics, its optimization, management and control. Various areas that can be optimized within the company refer to intralogistics (internal logistics). Everything that is done within the "four walls", thanks to which there is provision, management, tracking and optimization of cargo movements and information flows (Fig. 1.3.).



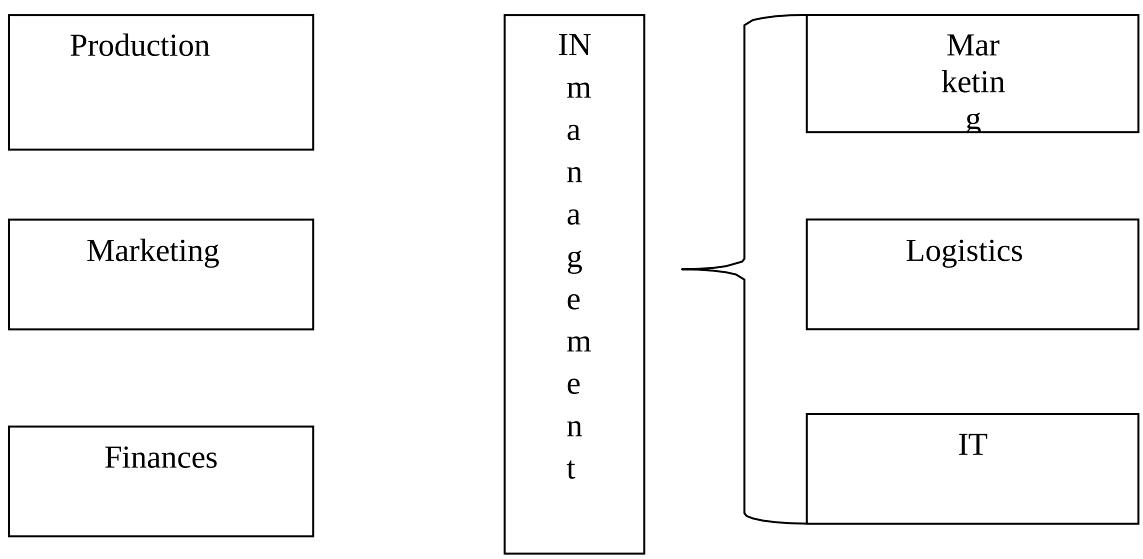
Rice. 1.3. Logistics process and relationship with various activities

Source: built by the author based on data [2]

Logistics management combines both theory and management practice. For supply chains, logistics management functions are assumed by supply chain management (at strategic and operational levels). However, with a narrow understanding of logistics, logistics management does not have the same integrating function as supply chain management. So, in this case, the logistics approach is used to implement basic management tasks where the strategic capabilities of the supply chain management methodology cannot be used due to localization of the area of influence at the enterprise level. With a broad understanding of logistics, supply chain logistics management is actually identical to supply chain management [1].

Logistics management, in turn, involves the use of management tools to implement logistics tasks. With a narrow understanding of logistics, logistics management actually boils down to managing transportation, storage, procurement, sales, etc. With a broad understanding of logistics, logistics management reaches a higher level and involves, first of all, the establishment and further development of logistics methodology at the enterprise, in the supply chain or in any other system [15].

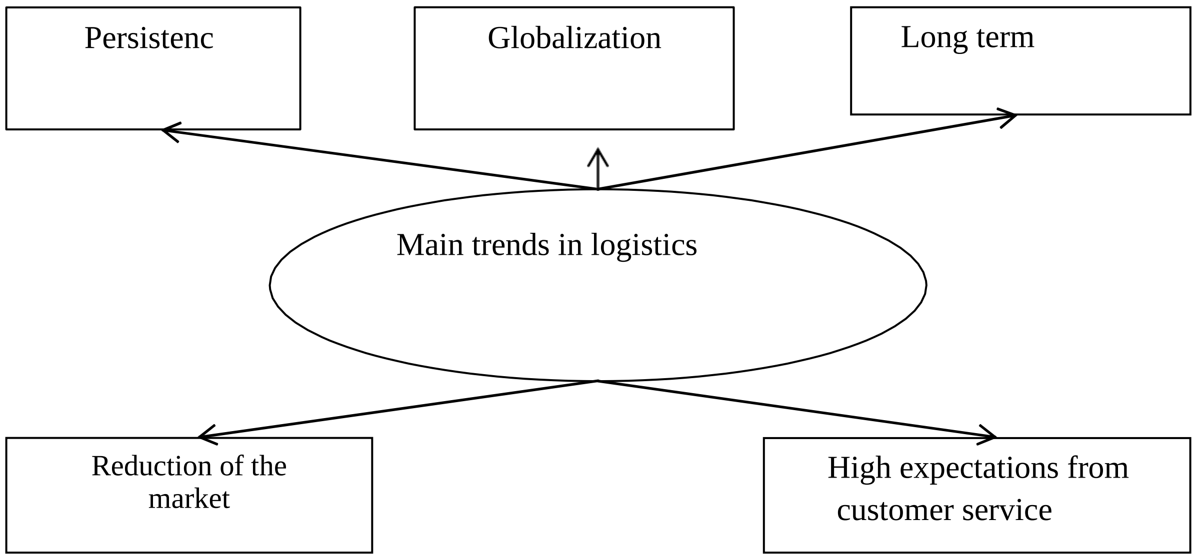
Let's illustrate these statements using the example of the evolution of approaches to enterprise management, including logistics as one of its parts (Fig. 1.4).



Rice. 1.4. Evolution of approaches to logistics management at the enterprise

Source: built by the author based on data [22]

The performance of basic logistics tasks in the company's divisions is not enough for effective and competitive management transport system logistics The overall optimal logistics result can be achieved only by holistic consideration of all logistics processes. At the same time, it is important that subsystems and processes take into account the general goals of the logistics system and are aimed at achieving the general economic optimum [36, 42, 46].



Rice. 1.5. Trends of influence on the development of logistics

Source: built by the author based on data [19]

To qualitatively confirm the relevance of solving the task of transforming Ukraine's logistics management within the framework of the European integration strategy, we will analyze the experience of the leading country of the European Union in the field of logistics - Germany, which will allow us to determine the features of the structure and technology of Ukraine's logistics management that should be transformed.

Logistics is Germany's third largest manufacturing sector after automotive and medicine, employing approximately 2.9 million people.

The total turnover of the European logistics services market is estimated at more than 600 billion euros. Germany is one of the most efficient and industrially strongest economies in the world.

The existing infrastructure (ports, road and railway network) and geographical location make Germany the logistics center of Europe through which cargo transportation is carried out. Thanks to these factors, the basis of production work of the economy, the efficiency of logistics systems is created; is the main success factor for companies operating in the international market [1].

Having a good image of the logistics territory, Germany also regularly stands out in the list of material and technical support of the World Bank.

Table 1.1 presents the top 10 countries with developed logistics according to the World Bank (WB) study for 2016 Connecting to Compete 2016 Trade Logistics in the Global Economy The Logistics Performance Index and Its Indicators.

Table 1.1

Top 10 countries with developed logistics

Country	LPI rank	LPI, %	LPI from the highest rank
1	2	3	4
Germany	1	4.23	100.0
Luxembourg	2	4.22	99.8
Sweden	3	4.20	99.3
Netherlands	4	4.19	98.8
Singapore	5	4.14	97.4
Belgium	6	4.11	96.4
Austria	7	4.10	96.0

Continuation of the table. 1.1.

1	2	3	4
Great Britain	8	4.07	95.2
Special Administrative Region Hong Kong, China	9	4.07	95.1
USA	10	3.99	92.8

Source: built by the author based on data [2]

According to the results of the World Bank study in 2016, the first place was taken by Germany with an index of 4.23 points. The second place is Luxembourg, with an index of 4.22 points, the third is Sweden, with 4.20 points. Great Britain, which is traditionally considered an advanced state in Europe and in many fields, took only 8th place, and the world leader in technology, the USA - only 10th place.

In 2016, World Bank specialists practiced the Logistics Performance Index developed by them to compare countries with each other LPI Connecting to Compete 2010 Trade Logistics in the Global Economy The Logistics Performance Index and Its Indicators. This indicator, used in the first report on international trade logistics in 2007, consists of subjective and objective assessments and helps to form a picture of logistically sound prospects for the countries offered according to experts of the World Bank, LPI presents an overall picture of the efficiency of the logical chain, taking into account customs procedures, logistics costs and infrastructure quality. The LPI is based on data from six performance areas:

1) the effectiveness of customs clearance and the quality of work of other border agencies;

2) level logistic transport information technology infrastructure;

3) accessibility and ease of organization of international supplies;

4) quality and competence of local logistics firms;

5) the prospect of observing international deliveries;

6) timeliness of the overall completion of deliveries.

In the 2016 World Bank rating, Ukraine took 80th place with an index of 2.74 among 160 countries.

The overall LPI indicator of Ukraine was composed of the following values:

- customs clearance — 2.30 (130 place);
- quality of logistics infrastructure — 2.49 (84th place);
- simplicity and prices of the organization of supplies — 2.59 (95th place);
- competence and quality of service provision — 2.55 (95th place);
- the ability to track and control cargo — 2.96 (61st place);
- delivery timeliness — 3.51 (54th place).

As can be seen from the values of the indicators, Ukraine has room to grow and work on.

Also, experts laid down another evaluation factor called "percentage from Germany". Taking the efficiency of German trade logistics as 100%, the World Bank analysts highlighted what share of it is the efficiency of logistics of one or another of the 160 countries included in the study.

Germany is an important, key international economic center, which ensures its future competitive position in the improvement of the main and separated logistics chains, forming and developing the entire structure as a whole.

If you look at Germany from the perspective of leadership, it is an example of hierarchy and consent: the sphere of responsibility and competence is strictly divided between employees, depending on the chosen position, orders are given from top to bottom and are not subject to discussion. The status of a manager in German companies depends on individual abilities, length of service, and formal confirmation of qualifications and education level. A German manager with a university degree gets a promotion once on average in four years, and for those who have a doctoral degree, the path to higher management is open [1].

It is worth noting that doctors of science in Germany enjoy considerable respect in society and occupy a higher social position than successful businessmen without a degree. The process of communication (interaction of different divisions) in German companies is strictly vertical: the opinion of a subordinate division is brought to the top management only through direct superiors, who transmit this information along the hierarchical chain from bottom to top.

German management is distinguished by a special style that has been developed for centuries and is rooted in the tradition of medieval workshops and merchant guilds, German managers are famous for their vision of perspectives and orientation to the future. The German style of rivalry can be described as severe, but even the fiercest rivalry never sets itself the goal of destroying its competitors.

In order to adequately understand the task of logistics management within the framework of the European integration strategy, the meaning of the concept of "logistics management" by domestic and foreign scientists should be analyzed.

Having analyzed literary sources regarding the definition of the term "logistics management" can be identified approaches, which are depicted in table 1.2.

Based on the opinions of scientists regarding the concept of logistics management, it is possible to highlight the main features that are the basis of the concept:

- management decisions;
- management functions;
- enterprise flow management;
- activity aimed at obtaining profit.

Table 1.2

Definition of the term "logistics management"

Scientist	Content of the concept of "logistics management"
1	2
A. Dolgov	Logistics management – it is an activity aimed at obtaining profit through the creation and sale of certain products or services [21].
B. Anikin	The organization of logistics management is under consideration as three types of activity - centralization, decentralization and mixed management [4].
B. Waters	Logistics management refers only to the management of some supply chains [20].
V. Sergeev	Logistics management is determined by the synergy of the main management functions (organization, planning, regulation, coordination, control, accounting and analysis) in achieving the goals of the micrologistics system. Logistics management is a defined managerial hierarchy personnel [23].
V. Ukraintsev	Logistics management is a synthesis of the main management functions, in particular, planning, organization, control and regulation of flow processes in economic structures to achieve system-wide goals with the lowest costs [25].
D. J. bowerox, D. J. Kloss	The essence of logistics management consists "in the creation and adjustment of such systems of management of flows of material resources, work-in-progress and stocks of finished products, which would serve as a support for business strategy of an economic unit" [10].
E. Krykavskyi	Logistics management is management in logistics systems based on the theory of logistics and the understanding of this term "is based on the integration of logistics and management in the form of "logistics management" as a complex localized system of managing material and information flows" [37].
L. Kostyuchenko	Logistics management is an integrated system of administration and partnership of business entities of the logistics supply chain [15].

Continuation of the table. 1.2

O. Sumets	Logistics management is understood as a direction of general management and one of the key components of the logistics activity of an agribusiness, which is implemented through the integrated management of flow processes with the aim of achieving the maximum efficiency of each element of the logistics system, ensuring its economic safety in the process of operation and maximum satisfaction of requirements end user with minimal costs [14].
O. Shandrivska	Logistics management is an approach to managing various objects (operations) in the management system using separate means and methods of logistics [11].

Source: constructed by the authoraccording to [29,30]

The leading institution in the field of logistics The Council of Logistics Management gives the following definition: Logistics management (logistics management) is a part of the process in supply chains, during which the efficient and productive flow of goods, their stocks, service and related is planned, implemented and controlled information from the point of their origin to the point of absorption (consumption) in order to meet the requirements of consumers. The given definition covers the flows of goods, services and information in the production and service sectors.

1.2. Regulatory and legal basis for management of logistics systems and processes

The main objects of logistics study are: goods (commodity resource), vehicles, permanent devices, information and financial flows, as well as relevant legal documents, etc. In the methods of logistics management, the content of its principles is formulated in a specific form that is adapted to the realities of the economic industry. Thanks to this, managers are satisfied coordinated activity at the enterprise and the integrity of the interests of the entire workforce [35].

To date, specialists working in the field of logistics feel a clear lack of regulatory and legal support for their activities.

Regulatory and legal methods used in enterprise management are based on legislative acts regulating the rights and obligations of the subject and object of logistics management, and on regulatory documents. They introduce logistics management into the legal field of the country, creating a legal basis for the formation and transformation of logistics flows [44].

Legal methods provide for the development of coordinated regulatory and legal acts that regulate information relations between subjects in the field of logistics.

The legal framework, in particular legislation in the field of logistics, considers important issues. Among them: the normative-legal base of logistics operations, normative documents regulating relations with suppliers, conditions and order of supply; documentation of acceptance and transfer of goods; legislation in the field of foreign economic relations [14].

The base of regulatory and legal management methods includes: the system of legislative acts of Ukraine, resolutions of the Verkhovna Rada of Ukraine, normative acts issued by the President, the Cabinet of Ministers of Ukraine, regional and local governing bodies and state administrations of various levels. Important regulatory and legal prerequisites for the creation of enterprise logistics management methods are [24, 27, 28]:

– indicative planning of the development of the country's economy and its individual industries and regions;

– state budgeting;

– price and socio-economic policy of the state;

– control of the economy thanks to the system of state orders for the production of raw materials and finished products of strategic importance;

– control over its efficiency of privatization of state-owned objects;

– state financial, customs, tax and credit policy and control over its implementation by each business entity;

– standardization of products, works and services and certification of activities of business entities;

– formation of the minimum wage level for all business entities with employees;

– state support for production through the provision of soft loans, subsidies, subventions and other benefits;

– state stimulation of innovative activity in the sale of goods on the foreign market and special economic zones, monitoring of the ecosystem, lessors and holding structures.

– to comply with the Labor Code of Ukraine.

The main feature of regulatory and legal management methods is the need to implement management instructions that come from state legal institutions to business entities [33, p. 225-226].

Most of the acts regulating management relations in the field of logistics can be developed by the enterprise itself. These can be: statutes, regulations on the logistics department; resolutions on certain issues of the enterprise's logistics activities.

For enterprises working in the field of logistics, legal regulation may affect [26, 32]:

- quality management of information and material flows;

- personnel equipment;

- office premises and equipment;
- documentation;
- goods traffic;
- quality control of goods movement; contracts awarded to other manufacturers; complaints regarding implementation; internal checks.

So, the legal methods of logistics regulation are, first of all, the legislation that defines the legal framework and norms for the implementation of logistics policy, which includes such sections as tax legislation, the law on money circulation, banking antimonopoly legislation, foreign trade legislation, etc.

The problem of normative and legal methods is extremely urgent. It is currently aggravated in connection with the transition to market relations, with serious changes in the mechanism of state administration and in the organizational and legal status of many subjects of administration and, what is especially important, objects (for example, a sharp strengthening of the independence of organizations and territories), with the known development of contractual obligations in the field of logistics management [45]. Serious defect national legislation there are discrepancy international legislation relatively questions management streaming processes (world trade, movement of resources, storage and movement of goods, etc.). The combination of national and international interests in the field of stream management requires the optimization of the current legislation of our country in directly formulation regulatory modes process transportation and storage of products, popularization of application of requirements international rules of Incoterms, etc. [38, 39].

In addition, to ensure effective transformations of logistics management in Ukraine, it is necessary to consider the place and level of standardization in Ukraine. The formation of an integrated effective system of control of information and material flows, which guarantee high quality of goods, is one of the

the main tasks of logistics. The use of logistics principles in production management makes it possible to implement such principles of quality management as mutually beneficial relations with suppliers, a systematic approach and customer orientation, a process approach [33, 34].

It is logistics that implements a systematic approach, combining the supplier, production and customer into a single mechanism. Of course, the principles of quality management are also implemented when implementing logistics management, but this happens indirectly. The following main provisions can be attributed to the logistical concept of production formation: refusal to produce series of parts for which there are no customer orders; rejection of excess stocks; rejection of overestimated time for auxiliary and transport-warehousing operations; necessary elimination of the defect; elimination of irrational intra-plant transportation; transformation of suppliers from the other side into loyal partners; elimination of equipment downtime [40,41].

The development of technical regulation, both at the national and international level, is beginning to show how important the role of standardization is. The main task of standardization is the creation of a system of regulatory and technical documentation that defines progressive requirements for products manufactured for the needs of the national economy, population, national defense, export, as well as control over the correct use of this documentation [3].

A standard is a normative document issued and approved by an official body for continuous use, containing guidance, rules or characteristics aimed at ensuring optimal results [46].

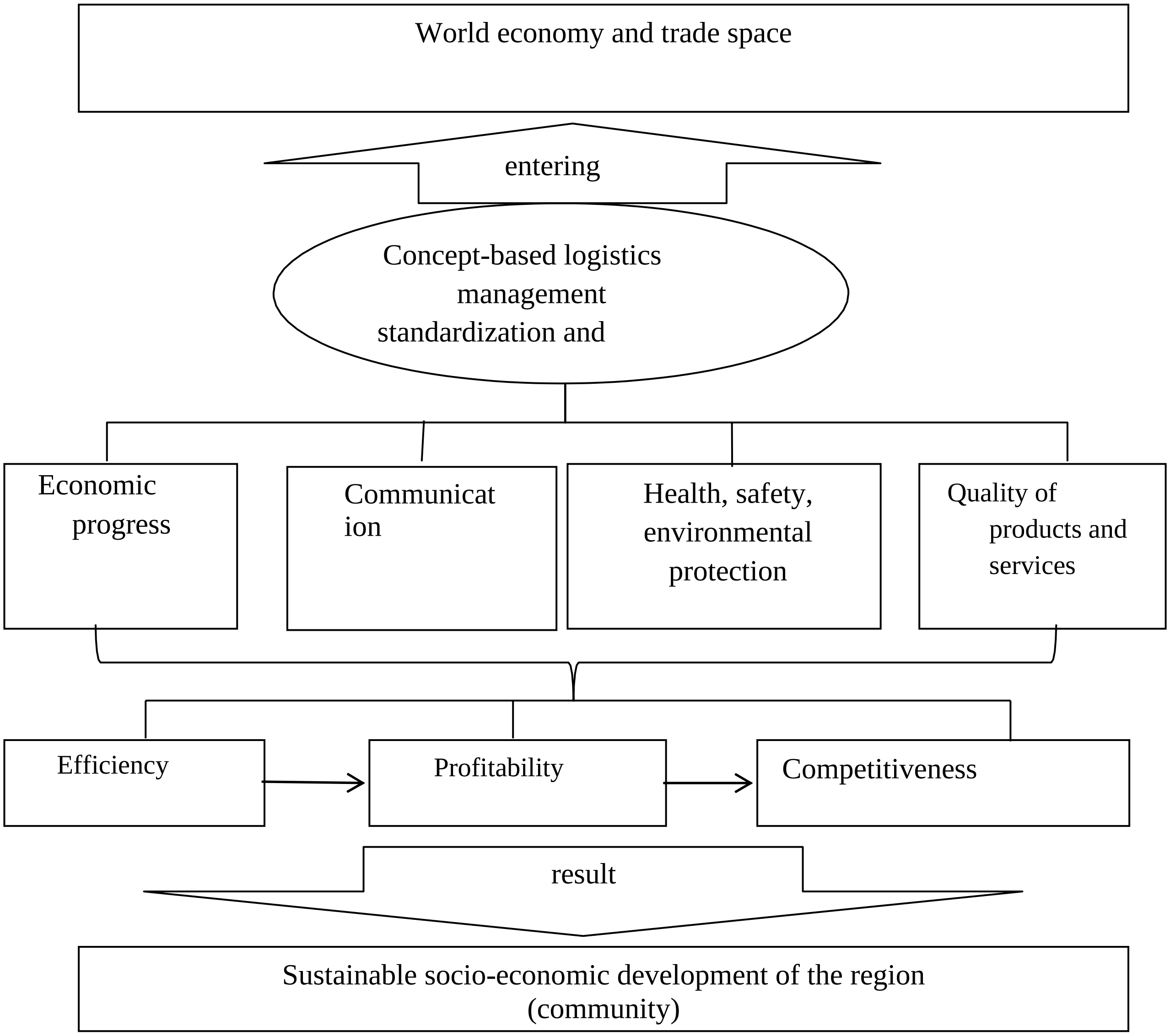
Standardization is a process of forming standards or a quality management tool at the state level.

The purpose of standardization is to guarantee the production of safe and high-quality products, the provision of works and services for the life and health of the population, the environment in accordance with the level of development of science, engineering and technology; savings of all kinds of resources.

In general, it should be clearly understood that standardization is considered now as a mechanism or tool for ensuring relations between different interested parties, which allows them to develop common positions using a common language of communication [28, 38, 39].

Standardization helps to increase production volumes and reduce the cost of production. However, the latter is caused by a number of other reasons - the organization's strategy and management. If the enterprise, along with standardized production processes, operates effective quality management and systematically analyzes the needs of all interested parties, then the organization can actually count on sustainable development and success [47]. In Figure 1.6. the impact of standardization on the economy and society is presented.

The task of international standardization is to simplify trade and production relations in the world, which is extremely important in the formation of global international markets, such as the United European, Asia-Pacific, North American, etc. Regional standardization is aimed at protecting the interests of a particular region. In particular, standardization in Europe (regional standardization) is intended to meet the needs of the Single European Market [46].



Rice. 1.6. The influence of logistics management based on the concept of standardization and certification on the economy of the region and society

Source: built by the author based on data [28]

The goals of European standardization include:

– consistency of national standards in EU member states;

– unified resolution of international standards by participating countries

– creation the only ones European standards in areas, where not there are international standards.

In table 1.3. distinctive features of European and international standards are presented.

Table 1.3.

Differences in features of European and international standards

International level	European level
Objectives of standardization	
Facilitating the exchange of goods and services around the world. Promotion of international cooperation in all areas	Development of the internal European market. Elimination of technical barriers to the free movement of goods and services within the European market
Organizations for standardization	
ISO-International Organization for Standardization IES-International Electrotechnical Commission	CEN - European Committee for Standardization SENELEK - European Committee of standardization in electrical engineering
Harmonization of standards	
A national organization can either adopt an international standard in its entirety or as a basis in its collection of standards, or develop an excellent standard	European standards must necessarily be translated into national standards collections of EU member states without changes, overriding excellent national standards

Source: built by the author based on data [28]

The main goal of ISO is to support the development of standardization at the international level to facilitate global trade and mutual assistance and to increase cooperation in the field of technical, economic, intellectual and scientific activities.

ISO defines the main directions and tasks of activity, among the main ones are [46]:

- creation standards in spheres engineering, chemical industry, agriculture, construction, health care;

- development of standards together with the International Electrotechnical Commission (IEC) in the field of information technologies, microprocessor technology, telecommunications;

- development and publication of international standards, standardization of quality assurance systems;

- cooperation with regional standardization organizations;

- support of the World Trade Organization through programs aimed at the gradual transformation of technical conditions for the supply of goods to ISO standards, stimulation of the creation of new standards for industry;

- assistance to developing countries in the creation of national standardization systems, adjustment of the level of standardization, training of standardization specialists in educational centers of developed countries;

- cooperation with the UN to support bilateral cooperation between industrialized countries and developing countries in standardization and metrology, in the creation of international educational centers;

- providing informational and methodological support to the ISO Council regarding the principles and methodology of creating international standards.

ISO activities in the field of certification ensure:

- providing support in concluding agreements on mutual recognition, with the aim of developing world trade;

- development of regulatory and methodical documents contributing to the harmonization of the certification procedure;

- cooperation with other international organizations to increase the role of certification in world trade;

- assistance in mutual recognition and adoption of national and regional quality assurance systems;

- development of rules and regulations for conducting tests, inspection control and certification of products, processes, activities of testing laboratories;
- cooperation with the MEK for the purpose of agreeing on common conditions for certification.

The European Committee for Standardization (ECS) is a European non-profit organization whose main goal is to support the development of trade in goods and services through the development and implementation of European standards.

SEN creates European standards in the following areas: aviation equipment, pumping stations, gas water heating devices, gas stoves, gas cylinders, components for lifting mechanisms, welding and cutting, pipelines and pipes, etc.

SEN develops European standards in the following areas: aviation equipment, gas water heating devices, gas cylinders, components for lifting mechanisms, gas stoves, welding and cutting, pipelines and pipes, pumping stations and others.

One of the principles of the work of SEN is the constant use of ISO international standards as a basis for creating Euronorms or supplementing the results achieved in ISO. The choice of a priority path must be justified by economic necessity, which is dictated by the level of influence of the future standard on the development of beneficial relations, the inability to use an international or other standard for the desired purpose, the proposal of the SEN member countries or the recommendations of the EU and EFTA bodies.

In addition to Euronorms, SEN creates harmonization documents (HD) and preliminary standards (ENV), designed to overcome technical barriers in trade and to accelerate the introduction of advanced technical conditions in the production of new products.

Harmonization documents clarify the essence of those administrative and legal norms that violate the non-diversity of the use of international standards in SEN member countries.

The European standard adopted by the SEN is issued in two versions: as a European norm and as a national standard in SEN member countries. In the second option, the standard may contain an appendix in the form of recommendations and explanations that correspond to its understanding and application.

For a successful and effective association of Ukraine with the European Union, the legal framework of logistics management of Ukraine should be brought into line with the legal framework of the European Union. This is necessary in order to ensure the acceptance of goods and products of economic activity of Ukraine on the world market, due to increasing the competitiveness of Ukrainian goods through the implementation and compliance with European and world standards [51]. In addition, it is necessary to standardize the technological operations of the logistics management of Ukraine, thus increasing the quality of logistics, in particular to solve the problem of connectivity, to ensure the growth of the volume of goods supplied to the market due to the increase of quotas, as well as the efficiency of logistics processes as a result of increasing the speed of movement loads [48, 49].

Since 2009, Ukraine has become a full member of the European Logistics Association.

The Ukrainian Logistics Alliance is an association founded in 2005 by Ukrainian logistics companies for the development of the logistics sector based on the principles of fair competition.

The main tasks of the Association are:

– protection of the professional interests of the members of the Association and their representation in the bodies of state power and management, professional and international organizations;

- promoting the improvement of the quality of services provided in the field of transport, forwarding and logistics;
- creation of favorable conditions for the construction of international supply chains through the territory of Ukraine by all modes of transport;
- expanding cooperation between Association members, creating equal opportunities, establishing and maintaining friendly partnership relations between Association members, providing services not prohibited by law for Association members and preventing unfair competition between them, etc.

All prerequisites have been created for the implementation of the European standard in Ukraine. In particular, in Ukraine under the auspices of the "Ukrainian Logistics Alliance" Association, the National Certification Center (NCC) was created, which received the right to certify the competence of logistics personnel according to the standards of the European Logistics Association from 12.14.2016.

The published standards for logistics, forwarding and supply chain management by the European Committee for Standardization CEN are provided in Annex A.

1.3 Methodical approaches to evaluating the effectiveness of logistics management

In modern conditions of economic development, almost every state is economically dependent, because the economies of countries are interconnected in most areas and directions. These relationships include: international circulation of products, services, labor and investment resources, information technologies and production. State economic policy is impossible without taking into account its influence on the economies of other countries. In the conditions of constant changes in the external environment, the question arises about the importance of key analysis indicators of the competitiveness of states and on determining priorities in the development of international trade logistics [31].

The realities of modern business are such that it is very difficult to exist on the market without the introduction of new approaches, solutions and technologies. Logistics from a fundamental science is increasingly turning into a practical dominant of enterprise activity. The use of logistics tools makes it possible to reduce costs, increase productivity, improve customer service, and thus gain competitive advantages. Therefore, there is an objective need for a system of indicators that would reflect the efficiency and productivity of logistics application areas [43].

Such Ukrainian scientists as A. Hajinsky, E. Krykavskyi, O. Tridid, N. Chukhrai deal with the problems of the development of Ukrainian logistics management. Among foreign scientists, the works of D. Bowersox, D. Kloss, J. Stock, and D. Lambert should be noted.

The problem of evaluating logistics indicators is most fully reflected in the results of research by Prof. Bowersox, Donald J. [19, pp. 593–613]. The author distinguishes the following categories of logistic indicators:

– costs;
– customer service;
– productivity;
– valuation of assets;
– quality.

For each category, a list of evaluation indicators and results of application in different types of business (manufacturing, wholesale trade, retail trade) are given. In [9, p. 90] emphasizes the fact that modern systems need a balance between financial and operational indicators, as well as between data from past periods and future indicators. The authors propose the formation of a system of balanced indicators in accordance with management tasks of logistics indicators, limited only to qualitative evaluation criteria.

Stock JR, Lambert DM. in their research, they reveal the impact of logistics on the profitability of interaction with consumers and profitability by product type, emphasize the shortcomings of existing reporting at enterprises, analyze how logistics costs should be used for decision-making and how the lack of accurate data on costs can lead to erroneous decisions. The authors consider the issue of measuring logistics indicators and controlling them using regulatory costs and flexible budgets, productivity standards and statistical process control [8].

According to scientists L. Mirotin and I. Tashbaev, the essence of the philosophy of the efficiency of the logistics system is defined as the ratio between the determined indicator of the result of the functioning of the system and the actual one" [57], in general, the degree of actual achievement of the result of the logistics operation. Scientists substantiated the integral definition of optimality or the criterion of minimum total costs of the logistics system, taking into account the quality of customer service. The authors recommended calculating several options for processing customer requests to determine the most efficient functioning of the production logistics system [57]. In general, the minimization of logistics costs, according to most scientists, is the main criterion for the efficiency of the logistics system. This definition is extremely important in modern conditions, however, in relation to cost reduction, another criterion for the effectiveness of logistics management is the provision of the appropriate level of logistics services. M. Christopher insists on this, because this condition for the efficiency of the logistics system is necessary [56].

The study of scientific publications gives reasons to state that in the works of scientists there is no single approach to the evaluation of logistics activities enterprises, often the evaluation indicators in various sources are not consistent with the evaluation criteria, the approaches of foreign researchers require adaptation to the accepted terms of domestic practice [54, 55].

For example, Yu. Ponomaryova defines "... the efficiency of the logistics system as an indicator (or a system of indicators) that characterizes the level of quality of the operation of the logistics system at a given level of total logistics costs" [58]. The scientist proposes to use costs, quality, time, assets in the evaluation. Costs are formed "either by the total monetary amount of expenses, or by the monetary amount calculated per unit of production (specific costs), or by a share in the volume of sales." Customer satisfaction is determined by "the firm's ability to achieve full satisfaction of its customers' requests." Time indicators allow the enterprise to quickly respond to the needs of consumers. The main time characteristics are: the duration of the production cycle from the order for the transportation of resources to the release of finished goods, the reaction time of the supply chain, the implementation of the production plan. Asset analysis shows the efficiency of capital invested in infrastructure and equipment; working capital "frozen" in inventories. The assessment of assets provides the speed of circulation of funds and the payback of fixed assets [58]. According to Yu. Ponomaryova, the value of the efficiency of the logistics chain is mostly less than 10%. The scientist emphasizes that "to strengthen the efficiency indicator, it is necessary to reach a deep understanding of the analyzed logistics processes and reduce the time, which does not increase the value" [58]. These logistic figures are not meaningful unless they are used for comparison with certain standards.

Therefore, the efficiency of the logistics system is an indicator (or a system of indicators) that characterizes the level of quality of operation of the logistics system for a given level of logistics costs as a whole. Logistics efficiency system is formed by the level of order service quality from the point of view of the consumer, which is the last link in the logistics chain [27].

The urgency of increasing the efficiency of the entire logistics chain requires increased requirements for the system of evaluation indicators, which in this case should satisfy the integral evaluation of logistics processes.

In most cases, the minimization of logistics costs is considered the main criterion for this efficiency. In the direction of cost minimization, which is relevant, but under the condition of obtaining the required level of logistics service. Thanks to this, the multi-criteria assessment of the efficiency of the logistics system has also become relevant [6, 8, 15]. Among the most common are the following evaluation criteria: costs, customer satisfaction/quality, time, assets.

Determining the amount of costs associated with the implementation of individual logistics operations shows the results of logistics activities to the greatest extent. The amount of expenses is usually expressed as a total monetary amount of expenses or a monetary amount based on a unit of production (specific expenses), or as a share in the volume of sales. In other countries, the analysis of logistics costs is performed as a percentage of GNP (for the country as a whole) or the volume of sales of finished products of the enterprise [8].

Customer satisfaction/quality - a group of logistics indicators, which includes the provision of services to consumers. These indicators outline the company's ability to achieve full satisfaction of its customers' requests.

The final indicators of this group are considered to be product quality, perfect order and customer satisfaction.

Among the current approaches to the assessment of the comprehensive efficiency of all operations focused on consumer agreement, the concept of perfect order is more interesting, which is interpreted as a criterion of the quality of logistics operations, accordingly, it is a benchmark for the overall efficiency of the entire integrated activities of the enterprise, and not individual functions. This indicator outlines how smoothly and properly the processing of the order takes place at all stages, that is, how organized the entire multi-stage application management process is, and whether there are no problems in it.

Perfect order – it organization work, which satisfiesthe following regulations:

1) full delivery everyone products by all ordered goods positions;
2) delivery in the period specified by the consumer with a permissible deviation in day;
3) clear and careful documentation regarding the application;
4) unmistakable compliance agreed conditions delivery (reliable installation, correct configuration, readiness for use and lack of applications).

Currently, the best logistics companies show a perfect order level of 55-60% of all their operations, while most others can't even reach 20%.

Customer satisfaction depends on order fulfillment time (functional cycle length), elements of error-free order fulfillment, and the company's ability to respond to requests (claims) made by consumers. The main indicators of consumer satisfaction are:

– delivery before the appointed time - a part of the orders completed before the appointed time or earlier;

– warranty service costs – the level of average actual costs for warranty service in profit;

– response time to customer complaints and their satisfaction: response time to a claim is the average time between receiving an application from a client and contacting him with the relevant representative of the company; claim satisfaction time - the average term until the client's requirements are fully satisfied.

The following are responsible for the quality of products: the number of claims, the frequency of product spoilage, the number of product returns from consumers, the cost of damaged products, the cost of returned products.

Time is the level of the company's ability to quickly respond to customer requests. Otherwise, they determine how much time passes from the customer's approval of the purchase request to the moment when the product reaches the consumer.

The main indicators of application processing time:

– the term of the production cycle from the request for the supply of resources to the release of the finished product - the cumulative term of external and internal transportation, necessary for the preparation of the product for shipment, if when the order was received from the consumer, the required product was not in stock, and no request for the supply of production components was created ;

– reaction time of the supply chain - the theoretical time required to establish and record significant changes in market demand, add the necessary adjustments to operational plans and improve the production of goods by 20%;

– execution of the production plan - the average actual frequency of full (+ 5%) following the calendar plans for the production of goods.

Asset analysis is an indicator of the efficiency of the use of capital invested in buildings and equipment, working capital. The assessment of asset management demonstrates how long the current assets turn over and how successfully the fixed assets return the costs invested in them.

The main diagnostic indicators of the use of assets:

– the accuracy of the forecasts is a retrospective assessment based on the nearest quarter of unerring average demand forecasts;

– aging of stocks - costs due to aging of goods as a percentage of their average price;

– capacity provision – the relative specific weight of loaded capacities in the full volume of available capacities.

Characteristic indicators of the efficiency of the use of logistics assets are: the duration of the operating cycle, profitability of working capital, profitability of fixed capital, inventory turnover (in revolutions and days), profitability of investments, profitability of total assets, etc. [50,52,53].

The listed absolute logistic figures have little value in themselves, but they can be used for comparison:

– with absolute standards - the best results that can be achieved;

– with target standards set based on goals that are valid and achievable;

– with past standards, when the analysis of the results obtained in the past is carried out;

– with competitors' standards, when processing competitors' results.

To measure the efficiency of the logistics system, financial indicators are often used, which are quite common, because they are easy to calculate, look reasonable, allow a systematic approach to the considered problems and compare the obtained results. However, they have minor drawbacks related to the processing of past results instead of current ones, do not respond well to changes, depend on some accounting techniques and do not take into account important logistical aspects. Sometimes financials can show that something is going wrong, but they don't tell you exactly what is going wrong or how it can be fixed.

It is necessary to note an innovative approach to the evaluation of the efficiency of the logistics system, the concept of the diagram of balanced benefits □is based on taking into account the main performance indicators, not necessarily financial ones, which provide the management of the enterprise with clearer ways of achieving strategic goals in comparison with the methods used in traditional evaluation, to a greater extent aimed at measuring financial indicators. At the same time, the main performance indicators are formed directly by the company's strategic goals.

To create such a diagram, it is recommended to use a four-step process:

1) drawing up a logistics chain management strategy;

2) finding realistically measurable parameters of achieved success;

3) disclosure of processes that affect final results;

4) delineation of the main engines of efficiency of these processes.

The presented scheme offers three key manifestations of success - speed, quality and cheapness. These goals are important because they link performance evaluations from the point of view of the consumer's perception of quality with internal indicators of the use of resources and assets.

Another approach to evaluating the efficiency of logistics activities and improving the operation of the logistics chain is the understanding of the structure of logistics processes. This approach consists in created process maps - flow charts that are formed when orders are received from the consumer and end with the delivery of products.

Creating a map of the processes that take place in the logistics chain is the first step on the way to understanding the possibilities of increasing their efficiency due to reengineering, which is defined as the idea of the existence of time [52].

According to the reengineering method, the efficiency of the logistics chain is defined as:

$$Елл = \frac{Чц}{Члл} 100$$

(1.1)

where Ell is the efficiency of the logistics chain; Thu - time that increases the value;

Chll is the time length of the logistics chain.

In general, the efficiency of the logistics chain is less than 10%. In the process of increasing the specified indicator, it is necessary to achieve a thorough understanding of the studied logistics processes and reduce the time, which does not increase the value.

SECTION 2
ECONOMIC DIAGNOSTICS OF LOGISTICS MANAGEMENT IN THE CONTEXT OF THE IMPLEMENTATION OF THE EUROPEAN INTEGRATION STRATEGY

2.1. Modern statelogistic management of Ukraine: interregional asymmetries

The modern period of economic development of Ukraine is accompanied by a long and rather painful transition of the economy to market principles of management - agriculture is declining, the sphere of industrial production is shrinking, the sphere of services is slowly but gaining positive development.

Effective trade and transport logistics are key to the development of the competitiveness of countries around the world. Logistics is strategically important for Ukraine, because trade between countries makes up a significant part of GDP. The geographical location of Ukraine at the intersection of main transport routes from Europe to Asia and from the Scandinavian countries to the Mediterranean region creates a unique potential for the development of services in the field of transit. An integral part of the Association Agreement between Ukraine and the EU (UA) is the development of the transport sector of Ukraine. Transport capacity in Ukraine is underutilized, the infrastructure and services available to shippers and logistics service providers are below the standards available in EU countries, and the logistics costs faced by end-users and all this despite the importance and potential in the field of logistics services .

Logistics management as a method of managing human, financial, information, and material flows associated with the disparity of regions of Ukraine, is the main logistical tool for increasing the efficiency of the economic and social activities of our state.

The constant development of economic science in the direction of regularities, principles and factors of the placement of productive forces in the conditions of market transformations requires the study of phenomena and factors that create a close relationship between the placement of productive forces and the development of the regional economy. The most developed infrastructure in the country's market economy are the regions that occupy the positions of the most investment-attractive territories and have additional conditions for regional development. As disparities arise in territorial development, they create opposition to the rational placement of productive forces, which emphasizes the primary importance of the development of the region's infrastructure, primarily transport, which contributes to the organization of the economic space and ensures the acceleration of the socio-economic development of the territories. Accordingly, the regional spatial asymmetry of the development of transport infrastructure and its impact on socio-economic development needs research.

A number of scientific works by both foreign and domestic scientists are devoted to the study of issues of regional spatial asymmetry in the development of transport infrastructure. The scientific works of such scientists as: O. A. Alimov, I. K. Bystryakov, M. P. Butko, V. M. Geets, B. M. Danylyshyn are devoted to the problems of regional socio-economic development, as well as to the study of spatial inequalities. M. I. Dolishniy, H. M. Kaletnik, A. G. Mazur, V. I. Pyla, V. A. Chumachenko, M. G. Chumachenko.

Western scientists such as: Y. Butler, U. Izard, F. Perroux, H. Myurdal, V. Nizhninsky, J. Tunen, A. Hirschman, J. Friedman, K. Weaver, D. Yull and others.

As T. V. Pena notes in his work [2], "... the general trend of the development of regions in new conditions is the deepening of all kinds of disparities in the economic space of the country, the growth of contradictions between the formed territorial and sectoral structure of the economic complex of the country and its regions and the needs of creating competitiveness and highly productive system of social production. In order to find ways to overcome spatial disparities in regional development, as well as the placement and efficiency of resource use, the definition of asymmetry is increasingly used in domestic and foreign literature."

According to the authors [3], it is precisely with the help of the definition "asymmetry" that the current conditions of the development of the regions of Ukraine can be optimally characterized, since it most fully illuminates the essence of various socio-economic processes, the dynamics and density of the placement of labor resources in certain territories under the influence of a combination of local factors , which have their unique features. In particular, asymmetric is understood as the territorially disproportionate development of the state, during which the gap between economically strong and underdeveloped regions is increasing, which is characterized by the discrepancy of regional indicators [3, p. 54].

Vakhovich I.M. and Tabalova O.E. [4] consider asymmetry from two positions: "the first is as an asymmetry of regional development, which indicates the process of breaking the harmony and balance of the socio-economic level of regions and increasing interregional differences; dredge - from the standpoint of sustainable development, as the level of interregional contradictions based on the initial and resulting economic, ecological and social parameters of the region's functioning over a certain period of time, which disrupt the normal course of economic processes in the country and prevent its stable development." This, according to the authors [4], creates the basis for the formation of territorial problems.

The asymmetry of socio-economic regional development has a positive and negative impact on the reconstruction of both individual regions and the state as a whole. It also has a positive effect on increasing the efficiency of using local resources, as well as creating the corresponding competitive advantages of individual territories. The negative trend of spatial asymmetry of regions should include the excess of those few positive economic and social effects, which brings an uneven level of provision of individual territorial systems with natural and climatic, production, labor and other resources. In other words, the asymmetry of regional socio-economic development during a relatively short period of time can create prerequisites for the emergence of economically backward and depressed territorial systems, inefficient use of local resources, depletion and degradation of the potential of individual regions. At the same time, it is natural that the relevant processes quite often become a threat to the integrity of the state.

Processes of assessment of regional development are regulated by the Resolution of the Cabinet of Ministers of Ukraine "On the introduction of assessment of interregional and intraregional differentiation of socio-economic development of regions" [12]. This methodology defines the procedure for evaluating and conducting a comparative analysis of the socio-economic situation, level and quality of life of the population with the aim of making relevant management decisions at the state, regional and local levels aimed at solving the problems of inter- and intra-regional asymmetry and unevenness of socio-economic development [12].

The indicated technique recommends the following:

– reveal the difference between the most prosperous and the most problematic regions;

– to reveal the segments and the nature of deviations of the values of socio-economic indicators of the studied territorial systems from their average value [10].

The general drawback of this methodology is that its application does not allow monitoring the trends and patterns of development of social, economic and ecological processes in the regions in accordance with generally recognized international standards of efficiency of management and regulation of regional development processes.

The exit of our country to a new stage of socio-economic development, integration into the world economic society requires the choice of such a strategic course that would unite the state and regional parties in guaranteeing the sustainable development of the economic space and its regional systems, stable economic growth based on the improvement of transformational processes. But the dynamics of the regions shows that these processes have not yet yielded positive results, have led to an increase in the differentiation of regional development, deepening of spatial disparities, strengthening of regional asymmetry in living conditions of the population, increase of regional inequality in the development of productive forces and promotion of disintegration of the economy.

Today's existing problems of asymmetry of regions are caused by ineffective regulation of transformational processes, not optimal structural reorganization of various economic systems of regions, which are functionally aimed at creating the composition and structure of the economic space of our country. Economic systems of regions are integrated structural formations that combine a large part of production-territorial formations with developed internal and external connections, which are constituent components, interconnected and interacting in the process of development and functioning. Regional economic systems in their process development changes, their work is accompanied by a change in the composition, types, forms and their combination, and their structural transformation is manifested in the change of parts, capacities and scales of production, interconnections and production relations, changes in the forms of organization and territorial proportions, and in the creation of new advanced market forms and types of territorial organization of their production.

The processes of transformation in the regions and their economic systems are not characterized by good dynamics, causing the growth of regional inequalities, which are transmitted through the differentiation of the effectiveness of the socio-economic development of the regions due to the ineffective system of regional management; inexhaustibility of financial mechanisms to meet the socio-economic development of regions; lack of strategic and tactical courses of socio-economic regional development. The complications of the practical tasks of the strategic transformation of socio-economic development outline the need to make appropriate changes to the existing paradigm of regional development, which undergoes considerable changes during globalization. Since the introduction of economic reforms contributed to the strengthening of regional differentiation and strengthened differences in socio-economic regional development, increased the polarization of their economies, the growth of regional asymmetry in the living conditions of the population and providing them with social services, this requires the creation of measures to improve the transformational dynamics, the development of the process of its regulation with a vector to ensure the stability of socio-economic development. The analysis points to the importance of these problems, because until now the transformational processes are not accompanied by the improvement of conditions and the quality of life, strengthen regional differentiation and disintegration processes, contribute to the increase of the gap between the levels of socio-economic development of the regions, the stratification of the population by income and living conditions.

The main ways of overcoming differences of an economic nature as a basis for the formation of the same conditions of the population's habitat are:

– increasing the effectiveness of market forms of management;

– reorganization of the economic base of individual regions for renewal on a new technological base;

– improvement of investment and innovation activity in the regions of the country and strengthening of their competitiveness;

– strengthening the efficiency of functioning of regional markets; support for the development of border and cross-border cooperation; formation of scientific and technical potential and ensuring competitiveness of the region;

– formation of conditions for the growth of production, small and medium-sized businesses; optimization of the legislative framework of regional development.

The economic expediency of effective economic and social activity of the state requires the active use of logistics management tools to mitigate and overcome the asymmetry of different regions, both in terms of technical means and logistics processes and resource flow management technologies. A successful solution to the stated problem can be achieved by standardizing the development of the regulatory framework and legal foundations of logistics management.

To overcome and weaken the spatial asymmetry, it is advisable to apply the peculiarities and differences of each region, location, etc. An example of solving this issue is the metallurgical production of Public Joint Stock Company "ArcelorMittal Kryvyi Rih" (hereinafter, Public Joint Stock Company "ArcelorMittal Kryvyi Rih" PJSC
"ArcelorMittal Kryvyi Rih").

ArcelorMittal Kryvyi Rih PJSC is the largest producer of a mining and metallurgical complex with a full metallurgical cycle. To him the following industries are included: coke-chemical, mine management for underground ore extraction, mining and beneficiation and metallurgical [11].

PJSC "ArcelorMittal Kryvyi Rih" is still today a production company with the largest raw material base of ferruginous quartzite deposits. Their development and enrichment of raw materials are carried out by two departments: mining and beneficiation production and mine management.

ArcelorMittal Kryvyi Rih PJSC is the largest producer of metal products in our country. The trend of the company's net income indicators is shown in fig. 2.1.

Rice. 2.1. Dynamics of net income indicators of ArcelorMittal Kryvyi Rih PJSC for 2010-2018, UAH billion

Source: [11]

Analysis of the dynamics of the net income indicators of ArcelorMittal Kryvyi Rih PJSC shows a gradual increase in net income for the period 2010-2018. In 2018, compared to 2010, net income increased by 2.89 times or by 189% and reached the level of 2.1 billion euros.

The main advantages of ArcelorMittal Kryvyi Rih PJSC include: - own mining of iron ores located at a close distance from the enterprise; - quite powerful blast furnace production; - use of the modern oxygen-converter process for the production of steel; - availability of two rolling mills close to the modern level: wire and fine grade wire; other mills cannot be called modern, but it is reasonable to consider them as a basis for the modernization of rolled production; - established energy supply system; - a developed transport system with various means of transport; - proximity to Black Sea ports; - availability of highly qualified ITP personnel (engineering and technical workers) and workers.

The main omissions of ArcelorMittal Kryvyi Rih PJSC:

- a small range of manufactured rolling products;
- pulverized coal fuel is not used in the blast furnace process;
- the dominance of slag redistribution (only slightly more than 1 million tons of steel is poured at MBLZ);
- the presence of operational March furnaces with a fairly large volume of molten steel;
- lack of combined processes in the steel-rolled section;
- large costs of material, energy and time resources for the production of rolled products - the main type of products.

PJSC "ArcelorMittal Kryvyi Rih" PJSC can be preserved in the conditions of Ukraine's entry into the Association with the EU only with its fundamental reconstruction, which should allow a significant reduction in the cost of manufactured products.

Another vivid example based on the use of geographical and climatic features or asymmetry is shown in the Carpathian region of Ukraine as a result of achievements in the tourism and recreation sphere.

The specialty of the region is ski resorts and landscape, health complexes with mineral springs, historical and architectural monuments of the region, national folklore and cuisine.

The mountain system of the Ukrainian Carpathians, which mainly includes the territory of the Transcarpathian region, is a unique eco-, forest- and agro-system, which has the necessary prerequisites for the perspective development, first of all, of recreation, tourism, the cultivation of organic food products and secondary use of the forest.

Taking into account the economic, scientific, technical and natural potentials existing in the Carpathian region, as well as its geographical and historical features, the strategic goal of the future development of the territory is formed in order to create an effective tourism system based on the appropriate use of nature, intellectual, labor and material and technical resources , which will satisfy the material situation of the population and the environmental safety of the Carpathian region [12].

Economic competitiveness of the recreational sphere World experience shows that tourism is a highly profitable branch of the national economy. For example, in Spain it gives 17 billion dollars. USA, which is equal to 30% of the income from the annual export of this country, in Italy tourism provides 11%, and in Denmark and Austria □ 8% of the income from the export of goods abroad. Undoubtedly, the indicators of the economic effectiveness of domestic tourism are still far from foreign ones, although there are separate centers in the Carpathians, in the economic structure of which the recreational industry is the leading one.

Next, we will also consider the Black Sea Economic Region - a representative of the successful use of regional asymmetries, located in the south of Ukraine. It includes Odesa, Mykolaiv, and Kherson regions. The area of the district is 86.4 thousand km² (14.3% of the country's territory), including Odesa the region occupies 33.3 thousand km², Mykolaivska 24.6 thousand km². Khersonska 28.5 thousand km².

The significant advantages of the economic and geographical position of the region are determined by the proximity of the sea, the proximity to coal and metallurgical bases and the presence of navigable rivers. It occupies a particularly important position, as it is the territory through which Ukraine carries out export-import activities with the countries of the Black Sea and Mediterranean regions. The largest rivers of Ukraine - Dnipro, Southern Bug, Dniester, Danube flow through the territory of the district, which are used to transport products across the territory of Ukraine, and also connect the enterprises of our country with its western neighbors. For this purpose, the international ferry crossing Illichivsk - Varna (Bulgaria) was created. A system has also been developed that provides direct transportation of goods from the Danube cities of Europe through the ports of the Odesa region to the countries of Southeast Asia and other regions. This kind of activity contributes to the development of Ukraine's international cooperation with European and Asian countries. Water objects located on the territory of the district are intensively used in the economy of the country, mainly for irrigation, industrial fishing, for the purpose of recreation and water supply. The district is best equipped with recreational resources, in contrast to mineral resources, which are relatively few. Non-mineral raw materials are found here in a limited amount. However, the district borders large raw material bases and industrial centers of the Dnipro economic districts and can successfully develop, in particular, the machine-building and chemical industries.

Specializes in shipbuilding and instrument building, electrotechnical and agricultural engineering, light, food, construction industry. Agricultural production plays a big role for Ukraine. Heat-loving and drought-resistant southern crops are grown here. The region supplies all of Ukraine with early vegetables and fruits. Based on intensive of agricultural production, viticulture and winemaking, fruit and vegetable canning, oil and fat, meat and dairy, and tobacco complexes are developed. The district is a large fishing base with a developed fish canning industry. Population density is very low, urban settlements are located mainly along the coast.

In modern conditions characterized by the gradual structural restructuring of the world economy as a result of the change in the balance between the economic centers of production and trade, the growing role of integration groups, the intensive development of new technologies in the field of logistics, Ukraine with its unique geographical position can potentially become one of the most competitive transit corridors. This would make it possible to obtain additional economic benefits from international trade and the globalization of international cooperation, which, in turn, would become a powerful impetus for the development of the national economy.

Unfortunately, an insufficiently thought-out transport and logistics strategy, the growth of interregional disparities in the development of transport and logistics support, and inefficient management at all levels led to a gradual decrease in competitive advantages in this area, the loss of the image of Ukraine as a transit state, and the ineffective use of the available transport and logistics potential.

Important conditions for the development and effective use of the transport and logistics potential of Ukraine are the development of an effective logistics management system at three levels:

- the macro level involves the development of a unified state concept and strategy for the development of transport and logistics potential, which will cover all regions and branches of transport services, infrastructure, investment support mechanisms and the development of scientific research in this field;

- regional level – the formation of a comprehensive program for the development of transport and logistics potential, taking into account production characteristics, the state of infrastructure and geographical location to eliminate interregional asymmetries, the formation of intersectoral and interregional transport clusters and nodes, which will create a single competitive transport and logistics system capable of integrating into the European and world networks of transit, logistics and forwarding services.

- micro level – the organization of effective management of logistics and transport enterprises, which will ensure the performance of all functions provided to consumers at a high level and involves effective planning, organization of the provision of transport and logistics services, an appropriate level of service, the implementation of innovative technologies and guaranteeing the reliability and timely movement of goods.

The organic combination of the above levels in time and space creates a single transport and logistics system, the level of competitiveness of which in the foreign market depends on each of the named elements.

We agree with the opinion of I.V. Pozanska that in modern conditions "increasing importance is given to the quality of transport services, the creation of new infrastructure facilities or the modernization of old ones, synchronization and harmonization of national norms to international standards in order to minimize the time spent on comprehensive formalities, the development of a new network of transport corridors taking into account future transportation needs and the elimination of "bottlenecks" that prevent the normal functioning of the market" [13, p. 99].

One of the factors of ensuring the efficiency of transportation is the reduction to a minimum of regional asymmetries regarding the state of the transport and logistics infrastructure, the availability of vehicles and service.

To determine the level of interregional asymmetries in the development of transport and logistics services, as well as to identify weak links in transport logistical support in the regions, it is advisable to conduct a comparative analysis. The results of the analysis can be taken into account in the process of developing and implementing a strategy for the development of the national transport and logistics system and creating prerequisites for improving the system of multimodal transportation, optimizing regional and interregional transport and logistics connections, adapting the management of transport enterprises based on the determination of the most optimal routes.

The main subjects of the transport and logistics transport market are primarily domestic and international transport and logistics companies and enterprises that use their services or have their own transport units. One of the important functions of the management of these enterprises is, first of all, activity planning, the quality of which depends on the availability of high-quality and reliable information about the state of transport infrastructure in the regions, the efficiency of the operation of various types of transport, service, work organization, communication and the level of application of information technologies, etc.

To identify interregional asymmetries in the development of transport and logistics management, it is advisable to conduct a comparative analysis of the main indicators characterizing the level of development of transport infrastructure in the regions and the efficiency of the functioning of transport industry enterprises. For this purpose, a number of coefficients characterizing these groups of indicators are proposed:

1) Indicators of the level of development of transport and logistics infrastructure (X):

- density of public roads, km. for 1 thousand

specific weight of paved roads, %;

- density of railway tracks, km. for 1 thousand km2;
- density of gas stations, units per 10 km. roads

Using the data of the State Statistics Service of Ukraine, the average indicators of the level of transport and logistics infrastructure in the regions of Ukraine as of 2016-2018 were calculated. The results of calculations are given in table 2.1.

Table 2.1.

Indicators of the development of transport and logistics infrastructure by regions of Ukraine for 2016-2018

Regions of Ukraine	Density of automobile roads, km/thousand km2 (x1)	Specific gravity of paved roads in total length by region (x2)	Density of public railway tracks, km per 1 thousand km2 of territory (x3)	Density of gas stations and service stations per 10 km. roads (x4)
Vinnytsia	358	94.3	41	3.2
Volynsk	308	93.6	30	3.5
Dnipropetrovsk	288	99.9	49	2,2
Donetsk	305	99.2	59	3.5
Zhytomyr	288	97.5	34	3,4
Zakarpattia	266	99.7	47	1.3
Zaporizhzhia	258	97.6	36	2,2
Ivano-Frankivsk	295	100	36	2,3
Kyivska	309	99.8	28	1.8
Kirovohradsk	256	98.5	36	3.2
Luhansk	165	99.2	41	6.2
Lviv	385	97.9	58	2,2
Mykolayivska	195	99.7	29	1.9
Odesa	249	97.3	31	1.9
Poltava	310	99.9	30	3.0
Rivne	259	98.6	29	3.0
Sumy	302	93.1	30	4.6
Ternopilsk	362	99.5	41	2.6
Kharkivska	309	97.5	48	2.0
Khersonsk	176	99.3	16	2,3
Khmelnytska	349	99.3	36	3.3
Cherkassy	292	97.2	28	2.4
Chernivtsi	358	99.8	51	1.7
Chernihivska	242	93.7	27	3.8

Source: [14]

As the results of the calculations showed, there are slight disparities in the infrastructural support for the functioning of the transport and logistics industry in the regions. Lviv Oblast is the leader in density of paved roads (385 km per 1,000 km2), Donetsk region in density of railway tracks (59 km per 1,000 km2 of territory).

Compared with average European indicators, the density of highways in the regions of Ukraine is significantly lower. For example, in Germany, the average density of highways in the country is 2,000 km. per 1,000 km2 of territory, France - 1,460 km. per 1,000 km2 of territory, Poland - 1,150. As for the density of railway tracks, Ukraine also lags behind most European countries. In particular, the average density of the railway track in Ukraine is 32 km per 1 km2 of territory, while in Slovakia this figure is 74 km. per 1,000 km2 of territory, Poland – 61, Austria – 66. Of course, the quality of the road surface is also much higher, as well as the organization of road network planning.

The largest concentration of service stations and gas stations per 10 km. of highways in Luhansk region, and the lowest in Zakarpattia region. In general, in percentage terms, the largest gap (78%) between the maximum and minimum value of the development of transport and logistics infrastructure (78%) is based on the indicators of the concentration of gas stations, as well as the density of railway tracks (72%).

2) Indicators productivity and efficiency work transport systems in the regions:

- the number of transported goods per one motor vehicle enterprise in the region, thousands of tons/unit.;
- cargo turnover of motor transport enterprises in the region, million tons/km.

- productivity of workers in the transport and logistics system of the region, which is defined as the volume of transport and logistics services provided per one worker in the region;
- profitability of transport and logistics enterprises in the region, %.

Based on the data of the State Statistics Service of Ukraine, performance indicators of the motor transport industry in the regions were calculated. The results of calculations are given in table 2.2

Table 2.2

Performance indicators of motor transport enterprises in the regions of Ukraine for 2016-2018

Regions of Ukraine	Productivitymotor vehicle enterprises, thousand tons/unit (y1)	Freight turnover of motor transport enterprises, million tons/km. (y2)	Productivitylabor in the industry, thousand hryvnias (y3)	Profitability of operational activities of motor transport enterprises, %, (y4)
1	2	3	4	5
Vinnytsia	8,9	512.5	3488.8	5.5
Volynsk	8.7	1075.0	7578.6	6.2
Dnipropetrovsk	8.0	1891.3	10163.0	7,8
Donetsk	14.8	279.2	6839.8	3.8
Zhytomyr	16.7	391.6	2317.9	-2.5
Zakarpattia	2.5	917.4	2016.4	1.9
Zaporizhzhia	4.4	620.5	7768.0	3.2
Ivan-Frankivska	10.5	701.2	3427.3	0.1
Kyivska	3.0	1320.4	6427.1	14.8
Kirovohradsk	38.2	727.5	3430.4	3,4
Luhansk	0.5	107.4	2318.1	0.3

Continuation of the table. 2.2

1	2	3	4	5
Lviv	7.6	2657.7	4137.3	3.1
Mykolayivska	4.0	691.8	4483.6	18.6
Odesa	2.1	1691.3	3123.8	13.3
Poltava	3.3	683.0	7008.4	4.7
Rivne	3.2	1012.3	2337.2	6.3
Sumy	2.6	213.7	3221.7	0.4
Ternopilsk	14.3	525.8	3005.2	1.7
Kharkivska	7.9	2377.3	4593.2	0.7
Khersonsk	2.9	364.6	2882.1	-0.5
Khmelnytska	12.7	656.2	3653.7	4.6
Cherkassy	4.8	376.7	5178.5	2.5
Chernivtsi	4.3	255.4	1680.9	-0.9
Chernihivska	1.5	526.9	4894.6	4.3

Source: calculated by the author based on data [14]

The conducted analysis showed significant interregional asymmetries regarding the development of the motor transport industry in Ukraine. In particular, the distance between the maximum and minimum values of indicators between regions is more than 90%. Kirovohrad Oblast has the leading indicators in terms of the level of productivity (38.2 thousand tons per one motor vehicle enterprise) of motor vehicle enterprises. However, this indicator is due primarily to the smaller number of enterprises in the industry compared to other regions. The lowest indicators of productivity of both motor transport enterprises and cargo turnover of motor transport enterprises are observed in Luhansk region, which is primarily due to the occupation of part of its territories, and on the other hand - violation of inter-industry and trade relations with Russia.

As for the efficiency of the work of motor transport enterprises, the most profitable are the enterprises of Mykolaiv (18%), Kyiv (14%) and Odesa (13%) regions, which is primarily due to high indicators of business activity due to the presence of important transport hubs and higher average indicators for cargo turnover in Ukraine. In some regions, including Zhytomyr, Kherson and Chernivtsi regions, the operating profitability of motor transport enterprises was negative.

An important stage in the assessment of interregional asymmetries in the development of transport and logistics systems is the determination of the normalized coefficients of selected indicators that will comprehensively characterize the state of the transport and logistics infrastructure and the efficiency of the development of transport and logistics enterprises in the regions compared to the value of the average distance between the maximum and minimum indicators in Ukraine. For this purpose, we have proposed a weighted average formula, which will allow to conduct a comprehensive analysis and also to determine the rating of regions according to these indicators.

According to the proposed methodical approach, the process of determining effective infrastructural provision and functioning of transport and logistics infrastructure enterprises is carried out in the following stages:

1) Standardization of indicators:

$$N_{pir} \quad \frac{P_{ir}}{P_{imax}} * 100 \qquad (2.1)$$

where, N_{pir} normalized i-th indicator of the development of transport and logistics enterprises of the region, which shows the level of development of the region according to this indicator relative to the maximum value achieved in the regions in percentage;

P_{ir} – -th indicator of the development of transport and logistics enterprises of the region

Pimax- the maximum value of the indicator achieved in the regions.

2) Determination of complex indicators by directions: infrastructural support of transport and logistics potential (X) and efficiency of operation of transport and logistics enterprises in the region (Y) using the formula:

$$X(Y) = \sum N_{pir} * 0.25 \quad (2.2)$$

3) Definition integral indicator transport and logistics provision of the region:

$$Ir = 0.5X + 0.5Y \quad (2.3)$$

Using the data of table 2.2 and formulas 2.1.-2.2. the calculation of standardized and complex indicators of infrastructure support for transport and logistics activities in the regions of Ukraine was carried out, reflecting the degree of compliance of the state of the infrastructure with the reference value in percentages. The results of calculations are given in table 2.3.

Table 2.3

Standardized and complex indicators of infrastructure support transport and logistics activities in the regions of Ukraine

Regions	**x1**	**x2**	**x3**	**x4**	**Kh**
1	2	3	4	5	6
Vinnytsia	93.0	94.3	69.5	51.6	**77.1**
Volynsk	80.0	93.6	50.8	56.5	**70.2**
Dnipropetrovsk	74.8	99.9	83.1	35.5	**73.3**
Donetsk	79.2	99.2	100.0	56.5	**83.7**
Zhytomyr	74.8	97.5	57.6	54.8	**71.2**
Zakarpattia	69.1	99.7	79.7	21.0	**67.4**
Zaporizhzhia	67.0	97.6	61.0	35.5	**65.3**
Ivano-Frankivsk	76.6	100.0	61.0	37.1	**68.7**
Kyivska	80.3	99.8	47.5	29.0	**64.1**
Kirovohradsk	66.5	98.5	61.0	51.6	**69.4**
Luhansk	42.9	99.2	69.5	100.0	**77.9**
Lviv	100.0	97.9	98.3	35.5	**82.9**

Continuation of the table. 2.3

1	2	3	4	5	6
Mykolayivska	50.6	99.7	49.2	30.6	**57.5**
Odesa	64.7	97.3	52.5	30.6	**61.3**
Poltava	80.5	99.9	50.8	48.4	**69.9**
Rivne	67.3	98.6	49.2	48.4	**65.9**
Sumy	78.4	93.1	50.8	74.2	**74.1**
Ternopilsk	94.0	99.5	69.5	41.9	**76.2**
Kharkivska	80.3	97.5	81.4	32.3	**72.8**
Khersonsk	45.7	99.3	27.1	37.1	**52.3**
Khmelnytska	90.6	99.3	61.0	53.2	**76.0**
Cherkassy	75.8	97.2	47.5	38.7	**64.8**
Chernivtsi	93.0	99.8	86.4	27.4	**76.7**
Chernihivska	62.9	93.7	45.8	61.3	**65.9**

The results of the calculations showed slight deviations of the comprehensive indicator of infrastructure provision of transport and logistics activity from the reference value. The highest level of closeness of the weighted indicators to the benchmark (over 80%) in Lviv and Donetsk regions. In other regions, the complex deviation is 60-70%, except for the Kherson region (52%). Therefore, despite the presence of asymmetries in the territorial distribution of individual indicators, the comprehensive indicators of infrastructure provision due to the manifestation of certain advantages in the regions do not demonstrate significant asymmetries.

Using the data in the table, the calculation of standardized and complex performance indicators of transport and logistics enterprises in the regions of Ukraine was carried out. The results of calculations are given in table 2.4.

The conducted calculations showed significant asymmetries in the regional development of motor transport enterprises in the context of the efficiency and productivity of their operation. Despite the high values of individual indicators, the complex value of the efficiency of the development of transport and logistics enterprises is quite low and shows significant interregional asymmetries.

The highest indicators in 2018 (40-58%) are observed in Dnipropetrovsk, Kyiv, Odesa, Mykolaiv and Kharkiv regions, that is, in regions where important transport hubs are concentrated and various types of transport are developed.

Table 2.4

Standardized and complex performance indicators transport and logistics enterprises in the regions of Ukraine

Regions	**x1**	**x2**	**x3**	**x4**	**Kh**
Vinnytsia	23.30	19,28	34,33	29.57	26.62
Volynsk	22.77	40,45	74.57	33,33	42.78
Dnipropetrovsk	20.94	71.16	100.00	41.94	58,51
Donetsk	38.74	10.51	67.30	20.43	34,24
Zhytomyr	43.72	14.73	22.81	-13.44	16.95
Zakarpattia	6.54	34.52	19.84	10,22	17.78
Zaporizhzhia	11.52	23.35	76.43	17,20	32,13
Ivano-Frankivsk	27.49	26,38	33.72	0.54	22.03
Kyivska	7.85	49.68	63,24	79.57	50.09
Kirovohradsk	100.00	27,37	33.75	18,28	44.85
Luhansk	1.31	4.04	22.81	1.61	7.44
Lviv	19.90	100.00	40,71	16.67	44.32
Mykolayivska	10.47	26.03	44.12	100.00	45.15
Odesa	5.50	63,64	30.74	71.51	42.84
Poltava	8.64	25.70	68.96	25,27	32,14
Rivne	8.38	38.09	23.00	33.87	25.83
Sumy	6.81	8.04	31.70	2.15	12,17
Ternopilsk	37,43	19.78	29.57	9,14	23.98
Kharkivska	20.68	89.45	45.20	3.76	49.77
Khersonsk	7.59	13.72	28,36	-2.69	11.75
Khmelnytska	33.25	24.69	35.95	24.73	29.65
Cherkassy	12.57	14,17	50.95	13.44	22.78
Chernivtsi	11.26	9.61	16.54	-4.84	8,14
Chernihivska	3.93	19.83	48,16	23,12	23.76

Therefore, performance indicators of motor transport and logistics enterprises depend on external and internal factors. The external ones primarily include the location of the enterprise in relation to potential consumers, the state of the transport infrastructure, and the level of economic development in the country. The internal factors should include, first of all, the effectiveness of planning, service organization, employee motivation, and control. Therefore, improving the functions and structures of logistics management at domestic enterprises is one of the important tasks that will increase the profitability of the transport and logistics industry and its competitiveness in the international transportation arena.

2.2. Problems of logistics management of Ukraine

The logistics potential of Ukraine can bring the country into the circle of the most logistically developed countries in the world. However, today it is not used to its full capacity, this is due to the underestimation by both state authorities and market participants of the fact that logistics is the driving force of the economy at both the mega and micro levels.

The history of the formation of logistics in Ukraine has its own peculiarities. In the post-Soviet period, logistics service in Ukraine was primitive. Separate services were offered by transport companies (vehicle fleets) and customs brokers. According to the results of experts' calculations, in most sectors of the Ukrainian economy in the mid-1990s, specific costs for the production of products and services were at least 2 times higher than in Japan, Germany, and the USA. One of the reasons was ignoring the principles of logistics. Among the factors that led to the need for the development of the industry, the following can be distinguished: a change in the philosophy of the market;

increase in the volume of world trade, growth in cargo flows; entry of international corporations to the market.

1990-2000 □ characterized by the development of distribution and trading companies that performed the functions of promotion, transportation and distribution of goods throughout the country. After distribution and trading companies, the first logistics operators began to be created to meet the needs of professional logistics services of international brands.

2000 - creation of national logistics companies that corresponded to the world level of equipment and development in their field. Logistics company UVK became the first 3PL operator in Ukraine. However, at the same time, European logistics companies are entering the Ukrainian market. This is the initial period of formation of the professional market of logistics services. However, at this initial level of development - it was not fully formed, not structured and in most cases opaque.

2006-2008 turnover of logistics operators actively increased in proportion to the growth in demand for their services. During this period, developers (developers) enter the warehouse real estate market. At the same time, several large projects for the construction of logistics complexes will be launched.

2009 - the financial crisis became a real test for all market operators. Due to the decrease in the volume of deliveries and purchases in almost all areas, the number of operators of the logistics market began to decrease, construction projects were frozen, and inevitable reductions took place. The remaining enterprises worked on the verge of low profitability, and often at a loss.

Forecasting the development of the logistics market in Ukraine, experts note the strengthening of competition and the acceleration of the process of consolidation of the logistics market. They believe that increasing the requirements for the quality of services, the reliability of contractors, and security will strengthen the tendency to redistribute demand in favor of large, of medium-sized and highly specialized companies, and will also cause inefficient participants to leave the market. The union of freight forwarders and warehouse operators will lead to an increase in the need for complex services. Positions are strengthened by logistics operators who are able to provide a systematic approach to customers and organize service throughout the country. The key factor in the growth of the logistics industry remains the increase in the turnover of retail, and specifically - network trade.

The basis for the formation of strategic tasks for the sustainable development of transport logistics in Ukraine is the existing historical and economic features of our country. After all, it is obvious that the modern Ukrainian cargo transportation market has certain noticeable differences compared to European and Asian counterparts. Therefore, the reasons affecting the strategy in the field of logistics of Ukraine include:

– the increase in costs for all types of transportation at an extremely fast pace (in particular, the increase in prices for oil and other energy resources);

– reorientation in the logistics market: from the service market to the consumer market, as a result of which the service and production systems significantly increased their efficiency, in order for the promotion of services on the market to produce the expected results, it became necessary to organize activities to reduce prices for services and supply them with appropriate quality in specified terms;

– information technologies began to develop dynamically, which contributes to the application of innovative technologies in transport and logistics activities (now it is possible to process large volumes of information, exchange data in real time with minimal costs and with a high probability of receipt).

Today, the Ukrainian logistics market is gaining elements of openness and professionalism. Enterprises are interested in the development of their business and the business of the Client, therefore they boldly go to the implementation of innovative solutions using IT products, look for new methods of optimizing costs for logistics New highly specialized directions in logistics management are being created.

In the process of developing competitive advantages, transport operators have started a cooperation procedure (industry associations and unions are actively working). This stage acquires a synergistic effect, that is, an active exchange of experience of all participants in the logistics process.

But, having considerable potential for the development of logistics infrastructure, today in Ukraine logistics is insufficiently developed as a branch of the national economy, and there are also a number of problems that slow down the process of transition of the economy to the European level.

The main problems are:

- Weak training of qualified personnel
- use of outdated technologies
- the problem of production organization
- the problem of standardization
- the problem of cargo transportation
- connection problem
- choice between own logistics and outsourcing;
- selection of models and methods for optimizing logistics costs;
- improving the quality of logistics service for customers;
- creation of own objects of logistics infrastructure;
- selection of key indicators when conducting logistics controlling
- low level of development of modern systems of electronic communications, electronic networks, communication and telecommunications systems.

In our opinion, the issues related to: improvement of logistics infrastructure, standardization of logistics services taking into account international and European standards, preparation qualified specialists in the field of logistics and the use of high-quality technologies of logistics services.

Ukraine has real prospects for developing its role as a transit state. This is facilitated by objective factors - geopolitical position and the presence of a powerful transport complex. The geographical location of Ukraine allows it to be a kind of bridge between Europe and Asia. According to the transit ratio, Ukraine ranks first in Europe. With the integration of Ukraine into the world economy, the development of trade and economic relations with other countries, the receipt of payments and fees for the transportation of goods by various modes of transport will grow significantly. For the transport and logistics system of any country, active participation in the globalization of the transport services market means: 1) liberalization of all spheres of transport activity, rejection of state regulation, and, therefore, increased competition;

2) active development and modernization of transport infrastructure, universalization and unification of vehicles, technologies, technical requirements;

3) increasing transparency of the transport services market, information openness (in particular, financial information), subordination of the activities of transport companies to the requirements of the law and international agreements [1].

Ukraine's advantageous geographical position on the path of the main transit flows between Europe and Asia, the developed transport network create all the necessary prerequisites for attracting significant volumes of transit cargo and passing them along the shortest routes. Growing cargo flows that connect Europe with Japan, China, India and other countries have an obvious attraction to Ukrainian transport communications. The primary task for increasing the volume of transit through Ukraine is to ensure proper management and organization of these processes. However, Ukrainian transport is affected by a number of destructive factors that lead it to lose its position on the world market of transport services. This is especially acutely felt at sea transport, which works almost entirely on the market of international transportation and is not always able to withstand the competition of the world market.

Currently, the issue of renewing the fleet has become acute - given the significant moral aging and physical wear and tear of ships (more than 15 years old), as well as their low-tonnage ships (its average figure is 3-5 times less than the similar one in the USA, Japan, Greece and Liberia). His decision requires the restructuring of the shipbuilding industry, the establishment of the production of ships of various purposes at conversion plants in Mykolaiv and Kherson, as well as at 8 ship repair plants of Ukraine. However, it is not enough that the goods are transshipped quickly and efficiently in the ports, first of all it is necessary to ensure the timely delivery of these goods to the final destination, which is possible only through the close interaction of rail, sea and road modes of transport. A manifestation of such cooperation is the organization of container, trailer, multimodal and intermodal transportation.

Another no less significant problem is the problem of standardization. Increasing requirements for logistics market participants in conditions of high competition and globalization, when among the players there are many foreign companies with world names, is an inevitable necessity. Especially if the business seeks to develop and expand its borders.

Today, as part of the fulfillment of the terms of the Association Agreement between Ukraine and the EU, and in accordance with European directives, there is an active process of adapting Ukrainian business conditions and the development of the country's economy, taking into account international and European standards. That is, new standards need to be developed under these European directives.

The economic advantages of applying standards in the field of logistics are indisputable, since standardization is a process of evolution, a transition to a qualitatively new level of development of the entire logistics industry.

The development of standards is a complex and difficult process that involves many professionals from the logistics field, both theorists and practitioners. Standardization affects many issues both in the field of university education and logistics business.

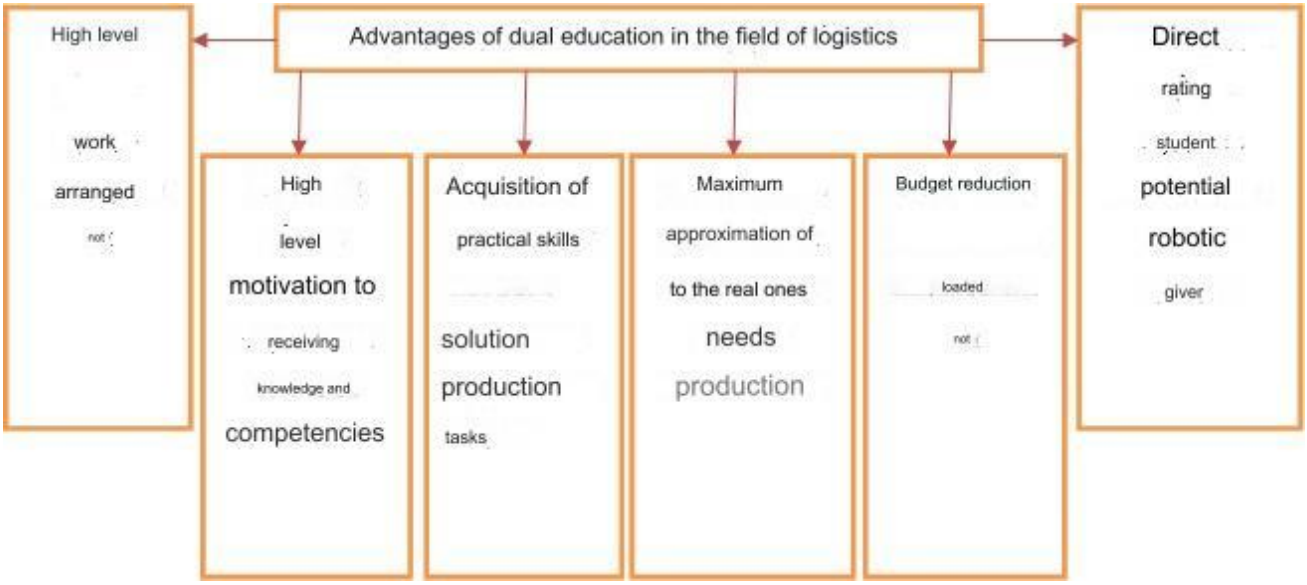
The type of activity, which is actively developing, at a certain stage requires the development of at least minimum norms and rules, requirements for the qualifications of the personnel involved. Each bona fide participant seeks to confirm the quality of their work, services, and goods in accordance with certain standards. Obviously, it is this factor, along with the growing demand and increased requirements from consumers of logistics services, that can be considered the main one in the field of logistics. It is especially important to implement the norms and rules of logistics activities in conditions where, unfortunately, dishonest "players" appear. Adoption of standards will create conditions for the unification of approaches and determine the level of quality of activity. At the same time, honest participants will be able to demonstrate their advantages, unite, forming a culture of a professional environment. Outsiders will either disappear or be forced to change their work style.

The next important problem in the field of logistics management in Ukraine is the problem of education and unqualified specialists

The lack of qualified specialists in the field of logistics is one of the factors that affect the position of countries in the LPI (Logistics Performance Index) rating [1]. The unchanging leader of this rating is Germany, which dictates world standards in the field of logistics, is a developer of innovative solutions and actively implements them on the market. Germany ranks first in the world in personnel competence and, accordingly, in the training of specialists in the logistics field.

Based on the education system in Germany, an effective solution to the problem of unqualified specialists and low-quality education is the introduction of dual education.

The concept of "dual system of vocational training" was coined by the German teacher in the field of vocational education Abel, and introduced into circulation by the German Committee on Vocational Education in 1964. The dual system of training for labor professions, which originated in Germany in the mid-1960s, has proven itself to be one of the best in Europe. The most striking advantages of such a system are the ability to quickly respond to economic changes in the country and adapt to the labor market [5]. The dual system of professional training has gained wide popularity and recognition in the world practice of professional education. What is a dual education system? In simple terms, this is parallel training in an educational institution and on the job. The basis of education is the principle of the relationship between word and deed, that is, theory and practice. It combines theoretical training at a professional educational institution and practical at the workplace in an organization or enterprise. One of the principles of this training system is the alternation of periods of study with periods of work. The practical part occupies at least 50% of the total percentage of training. Of course, these periods can have different durations, taking into account the specifics of the specialty and the company's capabilities, but the practical part of the training in terms of time should be at least half of the calendar year. [3, c. 68] This approach to obtaining a profession has undeniable advantages over the classical form of education. In practice, the student feels how the knowledge obtained at the educational institution and the realities of life are inextricably linked. In this case, there is no separation from reality, skills acquired in college or school are consolidated in practice almost immediately. This is due to the fact that when studying special disciplines, which are the basis of a student's professional training, there is no gap between theory and practice, which is traditional for the classical form of education. The student has a clear understanding of what he is studying and why, how and where he will be able to apply this knowledge in work And this is really a very serious motivation for obtaining professional knowledge. [1, p. 10]



Rice. 2.2. Advantages of dual education in the field of logistics

Source: compiled by the author

The dual form of education involves the employment of a student in an organization or an enterprise, that is, before graduating from an educational institution, a student has both seniority and work experience, which are so valued by employers. Adaptation to a new place of work, to the range of responsibilities and to the team, which sometimes scares people even in the profession, is painless for the student. In order to make the work process as comfortable as possible and start work without psychological discomfort, a mentor is assigned to the student from the first day at the company, who is ready to help, advise, and share experience. The scope of responsibilities of a working student increases gradually, as individual work competencies are mastered [6]. The indisputable advantages of dual education for enterprises are the acquisition of qualified mobile specialists, while reducing the overall costs of training; obtaining additional income and targeted training of an adapted specialist. Receiving the possibility of selecting specialists at the workplace solves the most difficult problem with personnel. In turn, the system of professional education due to the dual system is able to solve many problems of obtaining practice bases, employment of graduates, improvement of rating, quality of education. Close cooperation with the leading enterprises of the city or region, which is provided for by this training system, allows you to get new opportunities for training of teaching staff, social partnership, workplaces with modern equipment, and the fulfillment of state tasks [2, p. 22].

Next, we will consider how traditional education is inferior to dual education. The main problem of traditional education is the low competitiveness of university graduates. Theory and practice differ, a qualified young specialist is faced with psychological difficulties of getting used to work routines and life realities, which differ from his opinion about himself and the knowledge he has acquired. Traditional education is characterized by a long process of renewal. In modern conditions, when knowledge becomes obsolete at an incredible speed, when innovative technologies appear, the inflexibility of the traditional education system is a problem of the working class. The results of education do not meet the requirements of employers, which complicates the employment of graduates of higher education institutions. [4, p. 62] Based on the above, a new mechanism of interaction with employers is necessary, which allows for timely detection of changes in production technology and labor organization, to study the requirements of employers for professions, and to determine the necessary additional competencies.

The dual learning model is the most important component of this mechanism and it contributes to:

– development of professional competencies by graduates;
– formation of an active life position;
– formation of a responsible person capable of productive work.

– high percentage of employment of graduates;

– high motivation in acquiring knowledge;

– principle "from practice to theories", student more is working with production situations;

– assessment of the quality of specialist training by the employers themselves;

– possession by teachers of all innovations in production;

– reducing the burden on the budget [3, p. 95].

Another acute problem is the use of outdated, or rather, non-application of modern technologies, such as bar coding, real-time mode, wave processing, and specialized automated goods processing systems. Today, the market needs high-quality services provided on large volumes of logistics operations.

Weak logistics infrastructure at the level of enterprises, regions and the country as a whole seriously restrains the development of the industry. At the level of enterprises, the minimization of logistics costs is first of all necessary. This requires an effective management and monitoring system of enterprise logistics, implementation of modern IT to track the movement of products and cargo, and increase productivity. It is also necessary to reduce transport costs by improving the quality of roads, to create a cheap, fast and reliable transport infrastructure. In order to reduce the cost of storage and processing, a sufficient amount of warehouse space that meets modern requirements is needed.

It is often not understood why a company needs expensive warehouse management software. There is a whole range of problems directly related to the selection and implementation of the information system, since the market for the corresponding software is poorly developed, and the number of integrator companies is small; frequent attempts to use software designed for one purpose while solving other tasks; almost no software is used to manage the transport component.

The current state of logistics management in Ukraine will also help reveal the SWOT analysis, which is one of the most effective tools in strategic and logistics management (Table 2.5).

Table 2.5

SWOT analysis of logisticsmanagement of Ukraine

Object of analysis	
The current state of logistics management in Ukraine	
Internal factors	
Strengths (+)	Weaknesses (-)
Geographical location, climate I easily learn the support of the population of the European Union Development of the IT sphere	Weak training of specialists Lack of structuring in production Non-application of modern technologies Underdevelopment of transport infrastructure Low level of standardization
External factors	
Opportunities (+)	Threats (-)
Transition to a dual system of education Introduction of new technologies Adoption of legal acts to improve the mechanism of the transition to the European integration strategy of logistics management Use of modern results of technical progress in the field of creation of new cargo transportation equipment Use of the Black Sea shelf for development marine infrastructure	Low position of the country in the market of international trade Distrust of consumers in the quality of the product, population decline environmental threat, energy dependence Loss of electronic communications and communication systems

Source: compiled by the author

Currently, Ukraine, being at the crossroads of many trade routes, has a favorable geographical position and a favorable climate for cargo transportation. With the transition to a dual system of education and training of the population, the problem of weak training of specialists will be solved, which will raise the level of productivity of logistics management enterprises of Ukraine. having developing the IT sphere and introducing new technologies in the information support of industries and enterprises, Ukraine's position in the international trade market will increase. By increasing the level of standardization and receiving European quality certificates, the level of consumer confidence in product quality will increase.

2.3 Analytical software evaluations efficiency logistic management at the regional, national, and European levels

It is customary to evaluate the efficiency of enterprises, including ports, using economic criteria. The efficiency of the seaport is measured by an indicator that establishes the relationship between the obtained work result and the resources spent on achieving this result. Work efficiency, as a rule, is expressed in relative values. At the same time, in the numerator of the relative value is the achieved work result, and in the denominator - costs for achieving the work result. A higher value of the indicator value in this case corresponds to a higher work efficiency [1].

The measurement of costs and the result of port work can be done in value or natural (technical) indicators. When using value values, the efficiency indicator is called economic. Profitability can serve as an example of an economic indicator of work efficiency. When using technical values, the efficiency indicator is called natural or technical.

The economic indicators of the port's operation can be calculated subject to the availability of information about the profit received by the port for a certain period of activity. Various factors, including political factors, affect the amount of the port's profit. The profit of the enterprise is related to the payment of taxes and in a number cases, for obvious reasons, income information is provided in a distorted form.

To conduct a comparative analysis of port activity in different countries and economic conditions, it seems more appropriate to use natural performance indicators.

After analyzing the latest publications and studies, it became known that Mykolaeva N.K. and Davydova A.L. propose to calculate the efficiency factor of the sea port taking into account the technical equipment of the port, adaptability of the port to innovations and environmental conditions [2].

Adaptability of the port to innovations and environmental conditions are interconnected, as innovations are often caused by changes in the external environment. For this reason, in the numerator of the formula for calculating the coefficient of efficiency of the seaport, the coefficients of adaptability of the port to innovations and environmental conditions are summed up. The authors of the study do not indicate how to correctly assess the aforementioned adaptability for the port.

The coefficient of technical equipment of the port can be calculated in the presence of detailed information about all technical means of the port, which in some cases is difficult or impossible at all. In the reference literature devoted to ports, at best, information is given about the crane equipment of the port without indicating the characteristics of the warehouse equipment, which has a strong influence on the indicator of the technical equipment of the port.

The article [1] proposes the comprehensive use of performance indicators of a logistics enterprise. The author shows that the creation of a database is necessary for the formation of a system of enterprise activity indicators. After creating a database and a system of enterprise activity indicators, the researcher recommends applying the benchmarking procedure to analyze the enterprise's activity.

It should be especially noted the author's proposal to divide the performance indicators of the enterprise into indicators that characterize the enterprise and into indicators that reflect the activity of the enterprise. When assessing the efficiency of the port, this approach can be useful in some cases [1].

Zhelezkova P.E. recommends using the following indicators when evaluating the port's performance: technical equipment, cargo turnover, profitability, liquidity [3].

The main indicators of the operation of sea ports, according to the practice of port management, are cargo turnover and cargo handling [4].

A study of scientific works and publications on the topic of port performance evaluation shows that most researchers pay attention to economic evaluation criteria. Technical criteria of port performance are considered less often and in many cases are not suitable for integral assessment due to the lack of sufficient information.

The efficiency of the seaport is measured by an indicator that establishes the relationship between the obtained work result and the resources spent on achieving this result. Work efficiency, as a rule, is expressed in relative values. At the same time, in the numerator of the relative value is the achieved work result, and in the denominator - costs for achieving the work result. A higher value of the indicator value in this case corresponds to a higher work efficiency [1].

Measurement of costs and the result of work can be done in value or natural (technical) quantities. When using financial values, it is customary to call the performance indicator economic. Profitability can serve as an example of an economic indicator of work efficiency. When using technical values, it is customary to call the efficiency indicator natural or technical.

Let's consider the natural (technical) performance indicators of the sea port. The technical indicators of the seaport, in turn, are divided into differential and integral indicators of the efficiency of the seaport. The differential performance indicators of the sea port contain two values - the achieved work result and the technical parameter of the port, which ensures the achievement of the work result. Integral performance indicators of the sea port in the numerator or denominator contain a number of values that characterize the achieved work results and technical parameters of the port. At the same time, the numerator and denominator of the fraction contain aggregates of values reduced to the same dimension.

Differential technical indicators of seaport performance are, by their nature, separate technical indicators of seaport performance.

Let's consider a number of relative values that characterize the efficiency of the seaport from different angles. The result of the operation of the sea port, based on the purpose of the port, is the transshipment of cargo from one mode of transport to another (from one transport unit to another), storage and sorting of cargo, formation of commodity batches of cargo.

In world practice, it is customary to consider the port's annual cargo turnover as the achieved work result when evaluating the port's performance [4]. One of the values can be used as a technical parameter of the port, which ensures the cargo traffic of the port: the length of the mooring line, the area of the territory, the area of the water area, the area of warehouses, the total carrying capacity of the port's cargo devices.

The indicator is calculated according to the formula:

$$k_{ef1} = \frac{Q}{L}, \tag{2.4}$$

where: Q is the annual cargo turnover of the seaport, L is the length of the mooring line, the area of the territory, the area of the water area, the area of warehouses, the total carrying capacity of the port's cargo devices.

In each case, the indicator can be detailed. For example, when using the length of the mooring line, divide berths into deep-water and shallow-water berths, when using the area of warehouses, divide warehouses into open and closed or universal and special.

The indicator quantitatively characterizes the cargo turnover of the sea port, which is per unit of the technical parameter of the port.

A special place is occupied by the indicator, which is determined by the formula:

$$k_{ef2} = \frac{Q}{Q_P}, \tag{2.5}$$

where: Q is the annual cargo turnover of the sea port, Q_P – the annual throughput of the port.

The indicator quantitatively characterizes the cargo turnover of the sea port, attributed to port capacity. In other words, the indicator characterizes the degree of utilization of port capacities in the current period. The indicator is useful when assessing the port's capabilities in terms of a temporary increase in transshipment.

The value of the indicator k_{ef2} for the ports of Ukraine are given in table 2.6.

The only port of Ukraine, whose port capacity is fully loaded - Berdyansk port. The rest of the ports have at their disposal capacities that can be used promptly without attracting significant investments. However, the capabilities of the transport systems that serve the ports should be evaluated additionally. Thus, railways and roads are often not able to provide cargo flows with the maximum use of port capacities.

Table 2.6

The degree of utilization of Ukrainian ports (2016)

No	Namethe port	freight traffic,million tons	Bandwidth, million tons	Length of berths, km	Glybina, m	k_{ef2}
1	Southern	39.3	61.5	5.9	17.5	0.639
2	Odesa	25.3	56	9	14	0.452
3	Mykolaiv	22.4	29.6	3.8	11.2	0.757
4	Chornomorsk	15.9	64.3	6	14	0.247
5	Mariupol	7.6	18.8	3.9	9.75	0.404
6	Belgorod-Dnistrovskyi	0.46	1.1	1.1	2.8	0.418
7	Berdyansk	3.8	3.7	1.6	8.4	1.027
8	Ishmael	5.7	9.3	2.6	8	0.613
9	Olbia	6.5	1.5	1.5	11.5	0.121
10	Renee	0.97	8	3.6	7.5	0.121
11	Skadovsk	0.03	1.3	0.8	6	0.023
12	Ust-Dunaysk	0.03	5	0.15	6	0.006
13	Kherson	3.7	8	1.5	9.6	0.463
	Average					0.450

The table was built by the authors based on information [5]

The above-listed differential indicators of seaport performance are convenient when analyzing the port model for sensitivity to changes in the port's technical parameters. The indicators are effective at ports with a comparable cargo traffic structure and allow to assess the impact of each parameter on the port's cargo traffic separately.

Integral performance indicators of the seaport allow comparing the performance of ports with different cargo traffic structures. The comprehensive (integral) indicator of port performance is formed by combining individual (differential) indicators.

A comprehensive indicator of the efficiency of the seaport is expressed in the form of a coefficient. In the numerator of the relative value is the achieved result of the work □ the annual cargo turnover of the port in natural units. In the denominator □ the main technical parameters of the seaport.

The comprehensive performance indicator of a specialized seaport differs from the indicator for a universal port. Comparison of the efficiency of universal sea ports is connected with the need to take into account the structure of the cargo handled by the ports. Therefore, a comprehensive indicator of the efficiency of a seaport should, if possible, take into account the specifics of different ports and ensure the compatibility of ports of different specialization and structure.

To account for the specifics of the port, it is necessary to place the initial data characterizing the port. Some of the technical characteristics of the seaport are not reported, some of the characteristics are given in such a form that makes it difficult or impossible to compare the port with other ports.

A number of options are offered for calculating a comprehensive indicator of seaport performance.

An indicator of the efficiency of the sea port is proposed, which takes into account the area of the quay wall and the area of the port's warehouses:

$$k_{if1} = \frac{Q}{L \cdot H + k \cdot S_{sk}}, \qquad (2.6)$$

where: Q is the annual cargo turnover of the seaport, L is the length of the mooring line of the port, H is the weighted average depth of the mooring line of the port, k –weighted average coefficient of comparability of berth and warehouse, S_{sk} - the total area of the port's warehouses.

The weighted average depth of the mooring line of the port is determined by by the arithmetic mean formula for port depths near berths, where the weight of each berth depth is the length of the berth. It would be methodologically correct to take into account when calculating the indicator not the depth near the berth, but the height of the berth wall. However, data on the height of the quay wall are in the majority there are no cases. At the same time, there is a fairly close relationship between the depth near the pier and the height of the pier wall.

In some cases, instead of the weighted average depth of the port mooring line, the greatest depth near the port berth can be taken. The distribution of ships accepted by the port by precipitation may be similar to the distribution of berths by depth, which is explained by the well-thought-out policy of port development. In this case, the port will make maximum use of its capabilities, and the proposed formula will objectively reflect the degree of use of port capabilities.

The weighted average coefficient of comparability of berth and warehouse k takes into account the disparity in the complexity of construction, operation and cost of berth and warehouse facilities. It is possible to further detail the indicator due to the division of port warehouses by category (open, closed, specialized).

In a number of cases, port activity statistics are provided separately for cargo turnover in tons and for transshipment of containers in conventional TEU units. In this case, the following formula is proposed for calculating the seaport efficiency factor:

$$k_{if2} = \frac{Q + k_1 \cdot Q_k}{L \cdot H + k_2 \cdot S_{sk}}, \qquad (2.7)$$

where: Q - annual cargo turnover of the sea port for cargoes other than container cargoes, million tons; Q_k – annual freight turnover of the sea port by container cargo, thousand TEU; k_1 – average weighted coefficient of comparability of containers and general cargo, million t/thousand TEU;

L – the length of the mooring line of the port, km; H is the weighted average depth

mooring line of the port, m; k_2 – weighted average coefficient of comparability of berth and warehouse, S_{sk} the total area of the port's warehouses.

The coefficient characterizes the efficiency of the use of berths and port warehouses. The achieved result of the port's work is expressed by the port's cargo turnover. The cargo turnover of the port consists of traditional cargo and specialized cargo - containers, transshipped by the port. The port's traditional cargo turnover is measured in tons, and the port's container turnover in conventional units - TEU. To compare the components of the port's performance, a weighted average coefficient of comparability of containers and general cargo is introduced, which has a dimension of million tons / thousand TEU.

For a more detailed account of the port's warehousing, it is suggested to calculate the efficiency coefficient of the seaport according to the formula:

$$k_{if3} = \frac{Q + k_1 \cdot Q_k}{L \cdot H + k_2 \cdot S_{sk} + k_3 \cdot S_k + k_3 \cdot (V)^{2/3}}, \qquad (2.8)$$

where:Q - annual cargo turnover of the sea port for cargoes except for container cargoes, million tons;Q_k – annual freight turnover of the sea port by container cargo, thousand TEU;k_1 – annual freight turnover of the sea port by container cargo, thousand TEU; L is the length of the mooring line of the port, km; H is the weighted average depth of the mooring line of the port, m;k_2 – weighted average coefficient of comparability of berth and warehouse, except for container warehouse;k_3 – weighted average coefficient of comparability of berth and container warehouse;k_4 – weighted average coefficient of comparability of berth and storage capacity for bulk and/or bulk cargoes;

S_{sk}– the total area of the port's warehouses, except for container warehouses and containers for storing bulk and/or bulk cargoes, thousands of m2

;S_k – total area of container wareho$V$uses of the port, thousand m2; – the total volume of port containers for bulk and/or bulk cargo storage, thousand m3.

Coefficientk_{if3} differs from the coefficientk_{if2} the fact that warehouse capacities are detailed by dividing warehouses into warehouses for general and bulk cargoes, warehouses for containerized cargoes, warehouses for storing bulk cargoes in containers, warehouses for storing bulk cargoes. It is possible to further detail the indicator at the expense of the division of port warehouses for general and bulk cargo into open and closed warehouses.

Let's consider the use of formulas for calculating the coefficient of efficiency of maritime work on the examples of several ports in the southern region of Ukraine. Information about the ports and the value of the seaport efficiency factor are given in Table 2.

For example, taking into account the limitations of the source information, a variant of the integral coefficient of the efficiency of the seaport is usedk_{if1} , which is determined by formula (2.6). The results of calculating the efficiency coefficient for three ports of the southern region are shown in table 2.7.

Table 2.7

Data on the ports of the southern region of Ukraine (2015-2018)

No	Namethe port	Q, million tons	L, km	H, m	S_{sk}, thousand m^2	k	k_{if1}
1	Southern	15.07	2.7	14	187.5	0.0143	0.372
2	Odesa	25.59	10.2	9.6	485.49	0.0143	0.244
3	Chornomorsk	14.57	6	10.75	602	0.0143	0.199
	Average						0.272

Source: constructed by the authors based on information [6]

Table 2.7 was built by the authors on the basis of information According to the integral efficiency coefficient of the sea port, in 2015, the Southern port was used most efficiently. This result has an explanation - the modern port is not burdened by excessive berths and warehouses or is not limited by berths and warehouses. The second place occupied by the port

Odesa, due to the high level of management compared to the port of Chornomorsk.

The seaport efficiency factor can be calculated in another way. In the numerator of the formula for calculating the coefficient, instead of the annual cargo turnover of the sea port, the carrying capacity of the port is substituted. In this case, the indicator should be called the maximum efficiency ratio of the seaport.

The results of the calculation of the maximum efficiency ratio for three seaports of the southern region are shown in Table 2.8.

Table 2.8

Data on the ports of the southern region of Ukraine (2015-2018)

No	Namethe port	, Q_P million t	L, km	H, m	, S_{sk} thousand m^2	k	k_{if1MAX}
1	Southern	61.5	2.7	14	187.5	0.0143	1,519
2	Odesa	56	10.2	9.6	485.49	0.0143	0.534
3	Chornomorsk	64.3	6	10.75	602	0.0143	0.880
	Average						0.978

The table was built by the authors based on information [5]

According to the maximum value of the efficiency coefficient of the sea port, the South port has the greatest prospects for increasing cargo traffic, and the Odesa port has the smallest. Let's consider the use of formula (2.4) to calculate the efficiency coefficient of the Seaport k_{if2} on the example of the port of Odesa. The value of the marine work efficiency coefficient

of the port of Odesa with and without taking into account transshipment of containers are given in table 2.9.

The coefficient characterizes the efficiency of the use of berths and port warehouses. The achieved result of the port's work is expressed as an aggregate consisting of the port's cargo turnover and the number of containers overloaded by the port. Freight turnover is measured in tons, and container turnover is measured in conventional units

TEU units. To compare the components of the work result with each other, a weighted average coefficient of comparability of containers and general cargo is introduced, which has a dimension of million tons / thousand TEU.

Table 2.9

Data on the activity of the Odesa seaport in 2018

No	Namethe port	Q, million tons	Q_k, thousand TEU	L, km	H, m	S_{sk}, thousand m2	k_1	k_2	k_{if2}
1	Odesa	21,698	598.6	10.2	15	485.49	0.0102	0.0143	0.182
2	Odesa *	21,698	0	10.2	15	485.49	0.0102	0.0143	0.142

* Note. The second row of the table shows the parameters of the port of Odesa without taking into account the results of the container terminal.

The table was built by the authors based on information [6]

Seaport efficiency factork_{if2} on the example of the operation of the Odesa port in 2018, it is possible to estimate the contribution of the container terminal to the operation of the port - (0.182-0.142)/0.182=0.22. We compare using seaport performance indicatorsk_{ef1} andk_{if1} a number of Ukrainian and foreign ports.

Table 2.10

Data on ports of Ukraine (2016-2018)

No n/p	Name the port	Q, million tons	L, km	H, m	k_{ef1}	k_{if1}
1	Southern	39.3	5.9	17.5	10.42	0.381
2	Odesa	25.3	9	14	6.22	0.201
3	Mykolaiv	22.4	3.8	11.2	7.79	0.526
4	Chornomorsk	15.9	6	14	10.72	0.189
5	Mariupol	7.6	3.9	9.75	4.82	0.200
6	Berdyansk	3.8	1.6	8.4	2.31	0.283
7	Ishmael	5.7	2.6	8	3.58	0.274
8	Olbia	6.5	1.5	11.5	6.33	0.377
9	Kherson	3.7	1.5	9.6	5.33	0.257
	Average	14.47	3.98	11.55	6,392	0.299

The table was built by the author based on information [5]

For foreign ports, it is not possible to find out the area of warehouses due to the lack of data. For the specified reason, the performance indicators of the seaport k_{ef1} andk_{if3} calculated in table 2.10 and for Ukrainian ports without warehouse space.

Tables 2.11-2.13 show the results of calculating seaport performance indicatorsk_{ef1} i k_{if1} for a number of foreign ports.

Table 2.11

Characteristics of the world's ports

No n/p	Name the port	Q, million tons	L, km	H, m	k_{ef1}	k_{if3}
1	2	3	4	5	6	7
Data on European ports						
1	Antwerp	180	100	11.25	1.80	0.160
2	Hamburg	54.5	43	15	1.27	0.084
3	Le Havre	48.2	27.5	15	1.75	0.117
4	Marseille	180	26	15	6.92	0.462
5	Rotterdam	433	40	22	10.83	0.492
6	London	50	44	14.5	1.14	0.078
7	Liverpool	10.2	40	15.2	0.26	0.017
8	Manchester	11.4	17	12.2	0.67	0.055
9	Southampton	27.4	17	12.8	1.61	0.126
10	Milford Haven	30.7	2	20.7	15.35	0.742
	Average	102.54	35.65	15.37	4,159	0.233
Data on Canadian ports						
1	Vancouver	45	16	16.8	2.81	0.167
2	Halifax	13.5	12	9.3	1.13	0.121
3	Quebec	18.1	8	12	2.26	0.189
4	Montreal	25	23	10.7	1.09	0.102
	Average	25.4	14.75	12.2	1,822	0.145
Data on US ports						
1	Norfolk	59.9	12	13.5	4.99	0.370
2	Baltimore	52.4	40	13	1.31	0.101

Continuation of the table. 2.11

1	2	3	4	5	6	7
3	Boston	23.5	20	12.8	1.18	0.092
4	Long Beach	43	14	17	3.07	0.181
5	Los Angeles	38.7	22	15	1.76	0.117
6	Mobile	54.8	11.5	10,15	4.77	0.469
7	New Orleans	177	26	15	6.81	0.454
8	Chicago	74	37	9.4	2.00	0.213
	Average	65.4	22.8	13,23	3,235	0.250

Source: constructed by the author based on information [7]

Table 2.12 shows the average values of the characteristics of the ports of Ukraine, Europe, Canada and the USA, and the correlation coefficient between the performance indicators of the seaport is k_{ef1} i k_{if3} calculated .

Table 2.12

Averaged data on the ports of a number of countries

No n/p	Name	Q, million tons	L, km	H, m	k_{ef1}	k_{if3}	$k(k_{ef1}\ k_{if3})$
1	Ukraine	14.47	3.98	11.55	6,392	0.299	0.206
2	Europe	102.54	35.65	15.37	4,159	0.233	0.985
3	Canada	25.4	14.75	12.2	1,822	0.145	0.871
4	USA	65.4	22.8	13,23	3,235	0.250	0.936
	Average	51.95	19.3	13.1	3,902	0.232	0.749

Source: unzipped by the author based on information [7]

The average value of the correlation coefficient for ports in Europe, Canada and the USA is 0.93. A high value of the correlation coefficient indicates a close relationship between the performance indicators of the seaportk_{ef1} и k_{if3} which allows in the absence of data to calculate the indicatork_{if3} it is quite reliable to use the indicatork_{ef1} . For the ports of Ukraine, such a replacement is inadmissible.

From the consideration of the tables, it follows that the ports of Ukraine are inferior to the ports of the countries with which the comparison was made in terms of their cargo turnover. The length of the mooring line of the ports of Ukraine and the average depth in the ports are less than in the ports taken for comparison. The relative cargo turnover of the ports of Ukraine, which is per unit length of the mooring line and per unit area of the quay wall, respectively, is higher than that of the ports taken for comparison.

For the further integration of Ukraine into the international community, it is necessary to increase the absolute size of Ukrainian ports and deepen the water area of the ports. The high intensity of operation of Ukrainian ports at present gives hope for their competitiveness in the future.

Modern trends in the development of the national economy are formulated by the consistent reorientation of foreign trade relations in the direction of its integration into the European environment, and therefore research into the evaluation of the effectiveness of logistics management at all levels is becoming more and more relevant. The argument for this phenomenon is the increase in the volume of goods flows between Ukraine and European countries, which require high-quality logistics service, which is an important factor in the growth of the competitiveness of both the national economy and domestic product manufacturers.

At the national level, in the works of many domestic scientists, methodical approaches to evaluating the effectiveness of logistics management were considered. In particular, Kharsun L.G. notes that one of the important elements of the effectiveness of the logistics management of the country in modern conditions is the level of logistics service of goods flows between Ukraine and the EU countries, which is primarily characterized by the level of "compatibility of their logistics systems, i.e. technical, technological, legal and organizational-economic coordination and interaction between all their functional links" [15]. Additional indicators of the efficiency of logistics management, according to the author, are the level service, speed of service and reliability of functioning of checkpoints across the state border.

In turn, Ishchenko O.A. offers methodical approaches that will allow to evaluate the effectiveness of logistics management of transport and logistics services in terms of regions, individual territories and at the national level. According to the author, "The results of the analysis will reveal competitive advantages, problems of the development of transport and logistics activities, territorial disparities and develop a complex of organizational, economic, administrative and other measures to overcome them" [16]. The main groups of indicators by which it is proposed to analyze the effectiveness of logistics management attributed to: technical (characterizing the state of the transport and logistics infrastructure in the country, region and individual territories), organizational that determine the level of organizational support of logistics processes due to the presence of a sufficient number of transport and logistics firms, the productivity of their operation, the level of roadside and other services; financial, which characterize the economic efficiency of the enterprises of the transport and logistics industry, and informational (the level of provision of communication services and the level of information technology in the industry).

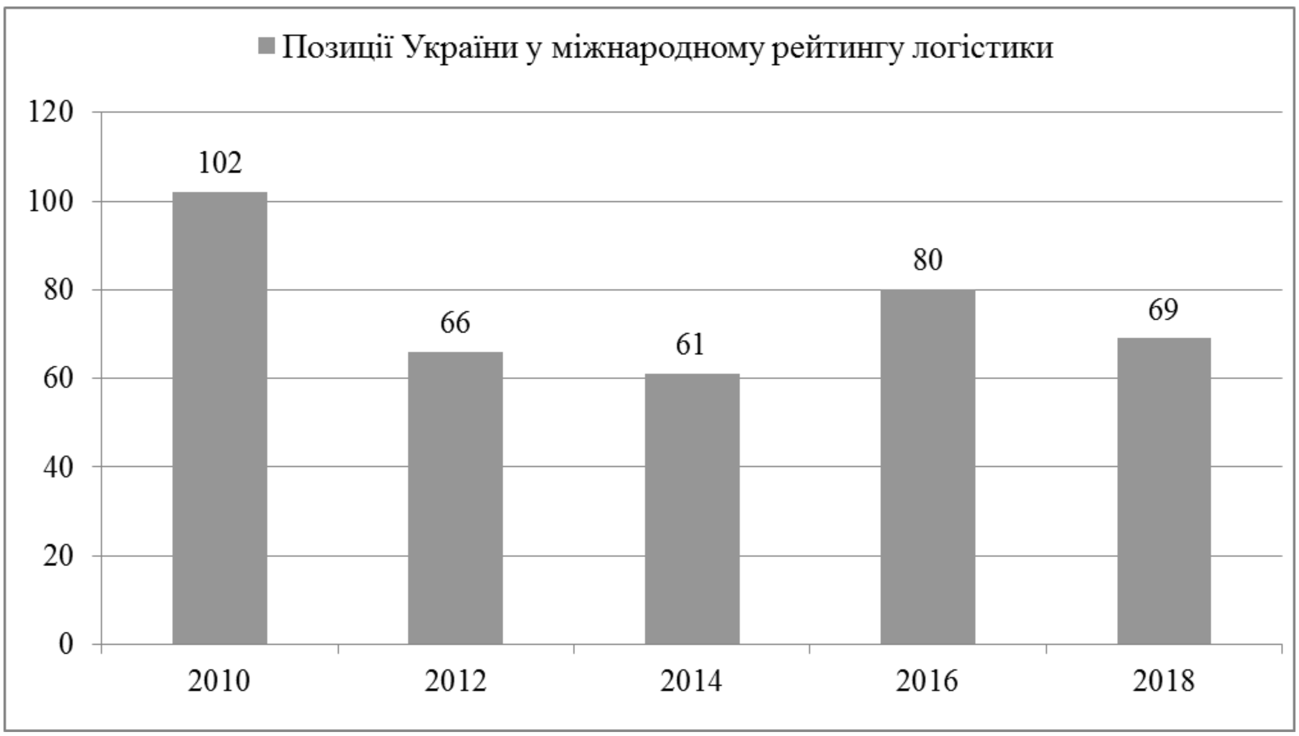
One of the indicators used to evaluate the efficiency of a country's logistics management compared to others is the Logistics Performance Index LPI, used by World Bank specialists.

Evaluation of efficiency is carried out on a 5-point scale according to the following criteria:

- assessment efficiency procedures customs design andborder management;
- quality of trade and transport infrastructure;
- ease of organizing affordable international transportation;

- competence and quality of logistics services;
- the ability to track and control the passage of cargo;
- the frequency at which the time spent on transporting goods to the destination is within the expected and predetermined delivery schedule [17].

The index is calculated every two years and is based on a survey of a sufficiently wide sample of users of transport and logistics services and companies. According to the latest rating published in 2018, Ukraine scored 2.83 points in terms of logistics efficiency and ranked 69th out of 160 countries in terms of logistics efficiency. Compared to the previous rating, Ukraine rose in the rating by 14 positions.



Rice. 2.3 Ukraine's place in the "Logistics Performance Index LPI" rating[18]

The diagram (Fig. 2.3) shows Ukraine's place in the LPI rating for the period 2007-2018 years As visible with charts, the highest positions (61 place) int he international rating Ukraine took in 2014 was also affected expectations related to the simplification of customs procedures and general economic growth in connection with the choice of the European development path. However, already in 2016, Ukraine worsened its position, falling in the rating by 19 points.

The rating includes 6 areas in which research is conducted and weighted average ratings are given on a 5-point scale. In 2018, Ukraine received the following points in the following areas:

1) Customs procedures – 2.49 points;

2) Transport and logistics infrastructure - 2.22 points;

3) International cargo transportation - 2.83 points;

4) The level of logistics management (competencies) -2.84 points;

5) Timeliness of delivery - 3.42 points;

6) Cargo tracking – 3.11 points.

In table 2.13 given the dynamics of the assessment of Ukraine's positions in the rating in terms of the above components.

Table 2.13

Dynamics of assessments of the state of logistics management in Ukraine by version of the World Bank

Rating indicators	Logistics factor	Customs	Infrastructure	International transportation	Logistic competences	Cargo tracking	Timelinessdelivery
2010	2.57	2.02	2.44	2.79	2.59	2.49	3.06
2012	2.85	2.41	2.69	2.72	2.85	3.15	3.31
2014	2.98	2.69	2.65	2.95	2.84	3.2	3.51
2016	2.74	2,3	2.49	2.59	2.55	2.96	3.51
2018	2.83	2.49	2.22	2.83	2.84	3.11	3.42
Growth in 2018 to 2010, points	0.26	0.47	-0.22	0.04	0.25	0.62	0.36

Source: [18]

According to Table 2.13, in 2018, compared to the state of logistics management in Ukraine in 2010, almost all indicators of logistics management improved, except for infrastructure. The highest value of the indicator of the state of the transport and logistics infrastructure was observed in 2012, which is typical for carrying out certain works on its modernization, because Euro□2012 was held. A significant increase in such indicators as cargo tracking is positive, which indicates the introduction of modern technologies and geo-information systems in the industry, as well as the speed of delivery.

The given trends show a certain improvement of logistics management in Ukraine compared to the previous period. However, these indicators are not enough to ensure the full entry of the national TLS into the European network.

The main problems of organizing logistics management in the country include:

- lack of distribution on the territory of nodal logistics centers and platforms;
- lack of coordinated work and agreement of tariffs between different modes of transport;
- ineffective use of fixed assets and imperfect planning of logistics routes, which leads to loss of time due to downtime, irrational use of available capacities, increase in storage and warehousing costs;
- low level of communication between logistics firms and enterprises;
- high level of receivables of carriers;
- shortage of specialists in the field of logistics;

- low level of development of cargo insurance system and insurance culture among carriers;

- low level of environmental friendliness and high level of energy consumption of vehicles.

One of the indicators of the efficiency of logistics management is the gross costs of carrying out logistics operations, which, according to the calculations of specialists of the European Logistics Association in the country, make up about 35% of the gross costs of production. For comparison, in European countries such costs are on average 7-12%, in the USA - 24%.

One of the problems that contributes to the increase of transport and logistics costs in Ukraine is the poor operational condition of roads and the lack of equipped autobahns, which do not allow the development of high speed of car traffic, thereby increasing fuel costs, amortization costs of carriers, and also complicate the process of reducing cargo delivery terms.

We agree with the opinion of L. I. Bazhan that the main goal of logistics management at all levels is planning, organization and use of transport systems to obtain the maximum possible economic effect. the use of the logistics system is to obtain the maximum possible effect. "The main tasks of the technology of integrated use of the logistics system follow from this:

- the formation of a useful effect with the necessary characteristics at a given time and in a given place of the material and information flow;

– creation of conditions for efficient consumption of goods and efficient use of transport and other services;

- ensuring the operational efficiency of the LS in all modes of its operation;

– creation of conditions for efficient use of labor;

- compliance with legal and international norms [19, p. 29].

On the basis of the conducted research, it is possible to systematize the indicators for evaluating the effectiveness of the management of transport and logistics systems at the macro-, meso-, and macro-levels. It should be noted that the evaluation of the effectiveness of logistics management at each level takes into account the specifics of management and the specific goals of the operation of transport and logistics networks.

At the macro level, the general normative and legal foundations of logistics management, conceptual goals for the functioning and development of the transport and logistics potential are being formed, capital investments in the development of infrastructure are being planned, taking into account the projected directions and rates of development of the global and national economy. Accordingly, the main indicators of logistics management efficiency at the national level include:

- volumes of gross products and services of the transport and logistics industry and its impact on GDP growth;
- volumes of investments in the development and modernization of transport and logistics infrastructure;
- volumes of transit transportation through the territory of the country;
- the amount of taxes and other payments received by the state budget;
- growth in the number of additional jobs in the industry;
- level implementation large-scale investment projects, in particular from attracting funds from international organizations;
- rates of renewal of fixed assets in the industry;
- the value of the level of compliance with the standards of the EU transport countries with technical, operational and environmental requirements.

The use of an appropriate system of indicators will allow to determine the effectiveness of logistics management both in terms of dynamics and in comparison with other countries or regions. The use of the given indicators can be it was also duplicated to assess the effectiveness of logistics management at the regional level and conduct relevant comparative assessments.

Indicators of the efficiency of logistics management include the economic results of the work of transport enterprises, namely: profitability of services, profitability of costs, the level of utilization of fixed assets both by region and by the main types of transport. One of the main indicators of management efficiency is the final results of the managed systems, in particular their profitability. Analyzing statistical data, it should be noted that the overall financial result of work in the industry during 2014-2018, except for 2016, is negative, that is, gross losses of enterprises are higher than gross profits. Table 2.14 shows indicators of the financial results of the functioning of the transport system of Ukraine in 2010-2018.

Table 2.14

Financial results of the functioning of the transport industry of Ukraine

Indicators		2010	2013	2014	2015	2016	2017	2018	Growth in 2018/ 2010, %
Financial result (balance), million hryvnias		5058.9	834.3	-19703	-13921	12819	-16532	-20732	-509
Enterprises that received profit	as a percentage of the total number of enterprises	54.6	63.1	62.7	70.9	71.7	71.5	74.1	19.5
	financial result, UAH million	10387.7	9429.9	12775.3	23093.7	28278	28509.1	31581.1	204
Enterprises that received a loss	as a percentage of the total number of enterprises	45.4	36.9	37.3	29.1	28.3	28.5	25.9	-19.5
	financial result, UAH million	5328.8	8595.6	32479.2	37015.5	15458.3	45041.7	52313.1	881

Source: [14]

The gradual increase in the specific weight of profitable enterprises from 54.6% in 2010 to 74.1% in 2018 can be called positive.

Table 2.15

Economic results of the operation of transport and logistics enterprises by region of Ukraine in 2018

Regions of Ukraine	Financial result (balance), UAH million	Businesses that made a profit	
		as a percentage of the total number of enterprises	financial result, UAH million
1	2	3	4
Vinnytsia	156.1	73.2	245.0
Volynsk	191.8	75.4	241.9
Dnipropetrovsk	-966.9	76.5	2761.4
Donetsk	-535.5	73.5	444.0
Zhytomyr	-131.7	71.5	75.8
Zakarpattia	86.6	79.6	137.0
Zaporizhzhia	-48.6	78.1	242.2
Ivano-Frankivsk	-86.2	81.5	77.5
Kyivska	2666.7	77.2	3083.0
Kirovohradsk	75.0	76.3	131.3
Luhansk	-17.2	73.0	28.4
Lviv	482.0	77.3	755.9
Mykolayivska	1547.3	68.0	1936.9
Odesa	4182.7	72.3	5975.8
Poltava	742.7	74.2	838.3
Rivne	21.6	68.5	103.8
Sumy	-78.8	66.2	58.2
Ternopilsk	-91.9	70.1	143.7
Kharkivska	32.8	72.7	468.6
Khersonsk	-20.7	69.0	98.6
Khmelnytska	64.9	75.5	115.2
Cherkassy	129.3	80.5	222.0
Chernivtsi	-4.3	73.8	45.6
Chernihivska	58.8	70.1	143.2

Source: [14]

There are certain asymmetries in the economic efficiency of the functioning of transport and logistics enterprises in the regional section. In particular, in 2018 year positive financial balance was observed in Kyivska, Mykolaiv, Odesa, Poltava, Lviv, Rivne, Cherkasy, Chernihiv, Zakarpattia, Vinnytsia, and Volyn regions (table 2.15).

Mainly unprofitable in 2018 year appeared the results work transport enterprises in Dnipropetrovsk, Donetsk, Zhytomyr, Sumy, Ternopilska, Khersonskaya and Chernivtsi regions In spite of a negative financial balance or a relatively low volume of received profits, the highest interest profitable enterprises observed in Ivan-Frankivka (81.5%), Cherkasy (80%), Zakarpattia (79.6%) and Zaporizhzhia regions. This indicates that a significant part of enterprises providing transport and logistics services in these regions are related to small and medium business.

A separate area of evaluation of logistics management is the analysis of its effectiveness in terms of the main types of transport and individual enterprises. Analytical support of the assessment should take into account the specifics of the functioning of certain types of transport, factors affecting their efficiency and the quality of the provision of relevant services.

SECTION 3

CONCEPTUAL BASIS OF THE FORMATION OF LOGISTICS MANAGEMENT OF UKRAINE IN THE CONTEXT OF IMPLEMENTATION EUROPEAN INTEGRATION STRATEGY

3.1. Development of an organizational and economic mechanism for the transformation of logistics management in Ukraine

The system of the logistics manager of the enterprise in market conditions can be considered as a mechanism of management relations, which includes the main components:

– laws and logic - the most essential relationships between the elements of the logistics management system, which ensure its integrity and functionality;

– methods, tools and levers of influence of the enterprise's logistics management bodies on the interests and needs of all participants in economic relations;

– an organizational structure that reflects the peculiarities of the enterprise's interaction with business partners and their cooperation, the specifics of the performance of specific logistical functions and management methods;

– information, that is, a set of factors about the internal and external logistics environment of the enterprise, as well as technical means of its collection, processing and storage, which significantly increase the productivity of the logistics management system;

– personnel of the logistics enterprise[1, p. 106].

The effectiveness of the company's logistics management strategy depends on the quality of the tools used in the development and implementation of relevant programs, procedures and strategies. As such tools appropriate economic mechanisms are adopted as a set of certain states and actions that make up the process of developing and implementing a logistics management system.

The economic mechanism of forming a logistics management strategy is a way of managing logistics resources, which includes a set of management functions, forms and methods of implementing such functions, interrelationships of functions and the organizational structure of logistics management.

The main tool of management bodies of logistics enterprises under the conditions of sustainable, managed, gradual development is the development of certain mechanisms of enterprise activity. A large number of management mechanisms are used in the economy - economic, economic, market, social, organizational, organizational-economic, etc.

Let's take a closer look at the essence of economic and organizational management mechanisms. I.O. Kryukova defines it as a set of elements influencing the material interests of economic entities of the national economy, the main of which are: pricing, planning, the system of payment of labor, the financial and credit mechanism, tax payments, economic stimulation and economic sanctions, commercial calculation and the system of economic standards [1, p. 106]. At the same time, the author does not take into account the root causes of economic activity, namely the desire to satisfy certain market needs and the need to take into account the competitive environment.

We propose to understand the economic mechanism as a set, a system of elements influencing the economic interests of economic entities, which takes into account the peculiarities of its external and internal environment

A separate type of economic mechanisms is the organizational management mechanism. Organized by I.V. Gontareva proposes to understand the purposeful, coordinated interaction of system elements during the functioning of this system [2]. The definition is more general

A.V. Kalina, who believes that an organizational mechanism is a well-grounded sequence of management actions, as well as methods for implementing the function and principles of management [4, p. 146]. However, the author does not define the purpose, orientation of this sequence of actions and methods for establishing the interaction of individual elements of the system.

As a result of a critical review of the approaches of modern authors, we propose to consider the organizational mechanism as a set of management actions aimed at organizing the interaction between internal elements in the middle of the system, taking into account the influence of the external environment.

But purely organizational levers of influence on the object of management without taking into account economic laws and regularities cannot give the required result. That is why most authors consider the creation and implementation of organizational and economic mechanisms of enterprise management to be the main means of achieving goals.

A group of scientists led by L.M. Varava believes that the mechanism of organizational and economic support of management is a set of means and methods of creating a system of integral management of the development and results of the enterprise [5, p. 97-98]. We cannot agree with these authors, since their definitions do not distinguish the tools for achieving the desired results, as a result of which the definitions of the organizational and economic mechanism almost coincide with the generalizing definitions of the "management mechanism" and simply

"management". The organizational and economic mechanism, by its very nature, should unite two subsystems of influence, on which the definitions of many authors are based. In addition, it should ensure an increase in the efficiency of activities, as a function of comparison of the result and costs of the company's resources.

As a result of a critical examination of the main theoretical approaches to determining the essence of mechanisms in the economy, it can be concluded that the organizational and economic management mechanism should be understood as a set management actions aimed at organizing interaction between system elements in order to achieve their economic interests, taking into account the characteristics of the external and internal environment [3, p. 64-65].

For a number of years, the transport sector has remained one of the priority areas of cooperation between the EU and Ukraine. Given the geographical location of Ukraine, its transport sector is of great strategic importance and is a leading priority in the cooperation between the EU and Ukraine. The transport sector is important for the economy of Ukraine, and therefore increasing its efficiency is particularly important for increasing competitiveness. The country generates much more transport processes and volumes of transport in relation to its GDP (estimated at 11-12%) than in any other European state, mainly due to the key positions of agriculture and heavy industry. This implies the significance of the transformation of logistics management of Ukraine, using foreign experience. Accordingly, the transport system has significant potential to improve aggregate productivity and regional competitiveness. The main problems of the industry (with the exception of aviation) remain the backwardness of infrastructure and rolling stock, combined with an outdated legislative framework. The reform process is uneven.

The modern development of the world economy is characterized by the intensive development of logistics management of the distribution and movement of various resources. The globalization of trade and transport companies at the beginning of the 21st century led to the development and creation of such digital electronic technologies as the English 5 PL, 4 PL, 3 PL, etc. German and American information systems that ensure the successful and efficient movement of goods and cargo around the world are also well-known. However, the existence of national borders and different national laws prevent optimal logistics management and regulation of the movement of goods from one state to another.

The development of unified or interoperable standards, both for direct goods and standards that provide logistics management, is relevant. In this regard, the development of the project - analysis of logistics management standards of Ukraine and Europe should be recognized as reasonable and necessary for increasing the efficiency of international trade.

The concept of the transformation of logistics management of Ukraine within the framework of standardization and requirements of the European Union should be presented in the form of a systematic statement of provisions (theoretical and normative), a list and specific content of the stages of research and development of the transformation of logistics management, development of specific examples of national standards for logistics management of Ukraine taking into account the requirements of the European Union .

The provision of the concept should contain the formation, definition of goals and objectives by types and types of LM, from the point of view of their standardization. Thus, for the movement of cargo (goods), it is necessary to take into account that it can be carried out by water and / or land, by air, and also in space. It is possible to move goods by sea, rivers and lakes, surface or underwater. On land, goods can be moved by road and/or rail transport. In addition, it is possible to move goods using pipelines: surface or underground. Appropriate specialized standards should be developed for all types or methods of cargo movement, taking into account their peculiarities, differences in natural and physical characteristics of functioning. It is necessary to take into account the conditions of multimodal movement of goods and movement of goods by envelope method (this is when the cargo, for example, in a container is placed in the body of a truck and together with it is moved in a railway car along the railway and then together with the car is unloaded at an intermediate point, and then at moves to the final destination with the help of a car).

Logistics management standards should cover the following directions or areas of logistics management:

1. Direct logistics operations in production (accumulation of goods, warehousing, accounting and storage; ensuring security; accounting for environmental safety; moving goods from the warehouse to areas of their use or operation; etc.). These are standards of industrial importance.

2. An important stage of work on the transformation of logistics management is the development of quality standards for transported goods, which are necessary to control the quality of transported goods and account for losses as a result of logistics operations for their transportation. Thus, as a result of a violation of the packaging of goods during their movement, the goods may be damaged. This can happen as a result of a violation of the sealing of the package and the ingress of moisture. Mechanical damage to the transported goods is also possible. Therefore, the development of national quality standards can be determined by the composition of goods exported from Ukraine. These are primarily the products of the agro-industrial sector of the economy of Ukraine: grain;

3. In order to create conditions for modern logistics management in Ukraine, the infrastructure of Ukraine should be developed and built on the basis of modern technical means and modern logistics solutions for logistics administration.

Next, we will consider the fragments of the project of the digital model of logistics management of Ukraine proposed by the author.

The modern globalization of world economic activity is closely related to the intensive movement of resources of various types between states and communities of states in the form of various economic and political unions and associations, such as the European Union, the union of Russia and the states of the former Soviet Union, the union of India, Brazil and etc.

The movement of resources is carried out both in terms of finance, information, energy, people, and material cargo, goods. Movement of material resources is traditionally carried out by water, land and air, and now also by space transport, while national borders are inevitably crossed.

The process of moving resources across national borders, as well as changing the environment of cargo movement, for example, moving cargo by land and then by water or air, is connected with the problem of connectivity, that is, the solution to the problem of overcoming connectivity when national requirements and natural conditions change.

The problem of connectivity in logistics is a cornerstone in solving the task of creating a single digital model of information systems for managing logistics supply chains in real time. Today, this problem is formulated in the regulatory documents of the European Logistics Association. However, the specifics of the connection problem have not been sufficiently studied, although attention is paid to it in the studies of logisticians.

An interesting problem of logistics is solving the task of ensuring reliable transmission of information through the interfaces of logistics information systems. One of the important solutions to the coupling problem can be recognized as a technical solution for connecting the railway rails of the coastal railway track and the rails on the sea ferry.

Here, the tasks of connecting the rails in space in both horizontal and vertical planes are solved while the hull of the sea ferry is simultaneously swaying from the impact of wind waves on it. It is also necessary to ensure the accounting of tides and the change of roll of the ferry deck when the load on the ferry changes.

This task is solved in different ways. Namely, the use of mechanical devices that compensate for the change in the position of the rails on the ferry deck at the point of their docking with the rails of the stationary part of the pier. To compensate for such inconsistencies in the positions of the rails and reliably overcome the conjugation problem, devices are also used here that allow to cushion the fluctuations of the elements of the logistics chain at the point of their docking.

Another interesting example of a connection solution is to ensure a reliable and uninterrupted transfer of goods of the transport system of a crossing across a navigable reservoir. Here there is an intersection of the flows of goods transported by water by ships and goods moved by road or rail transport. A difficult situation can arise in the case of major repairs of a stationary road or railway bridge across a river or a sea bay, as well as across a strait if it is necessary to maintain shipping traffic on the water.

The movement of cars and railway warehouses can be provided with the help of pontoon ferries or ferries. The use of ferries leads to a delay in the movement of transport on land, as a certain time is required for the loading and unloading of transport on the ferries.

Moreover, the volume and quantity of transport is limited by the tonnage of ferries. Also, the crossing of water obstacles by ferries takes time, which delays the transportation of goods in general.

Repair of a stationary bridge or tunnel is carried out over a period of time, usually several months. Another logistical solution to the problem can be the use of a pontoon bridge, while the movement of goods on land will also be delayed due to a decrease in the speed of movement of goods on the pontoon bridge. This method is more efficient than the method of overcoming a water obstacle using ferries.

The main strategic priorities of the national economy at the current stage of development are gradual integration into pan-European systems, setting up multilateral cooperation with EU countries and increasing the volume of international trade in goods and services. In this regard, Ukraine faces new challenges and difficult tasks related to the possibilities of effective adaptation of economic systems to new market conditions of management and their transformation in accordance with high economic, social and environmental standards of functioning.

One of the foundations and an important component of economic integration processes in the EU countries is the formation of a single transport and logistics strategy for infrastructure development, coordination of transport and logistics flows, which was called Eurologistics.

Ukraine occupies an important place in Eurologistics projects due to its favorable geographical location. The following areas of Ukraine's participation in European transport and logistics integration are distinguished:

1) pan-European transport corridors of the PEK;

2) transcontinental transport corridors of TCTC;

3) pan-European transport zones;

4) international logistics terminals [4].

The Association Agreement between Ukraine and the European Union, signed in 2014, creates prerequisites and is also the basis for sustainable relations between Ukraine and the European Community. In particular, the deepening of the free trade zone provided for by the Agreement opens up opportunities for the free movement of capital, goods and services. At the same time, our country faces a number of difficult tasks regarding the adaptation of legislation and the implementation of European standards in production, organization and control of the functioning of economic systems.

In order to organize the work on the implementation of the Association Agreement, the Ministry of Infrastructure established a Coordination Council and eight working groups in the relevant areas (transport policy and infrastructure, safety and transportation of dangerous goods, aviation, railway, sea, river and road transport, road management, postal communication communications and tourism). Working groups developed and approved 15 orders

Cabinet of Ministers of Ukraine and approved 45 implementation plans of EU legislation [5, p. 96].

One of the key areas of cooperation between Ukraine and the EU is transport, according to Article 367 of the Association Agreement, the parties:

- deepen and strengthen cooperation in the field of transport in order to promote the development of stable transport systems;
- support efficient and safe transport, as well as intermodality and interoperability of transport systems;
- strengthen the main transport links between the territories of the Parties [6].

The main areas of implementation of the Agreement in the field of transport are systematized in fig. 3.1.

The implementation of the specified directions requires a gradual transformation of logistics management systems based on the development of a comprehensive strategy for the development of transport, taking into account new challenges, opportunities and forecasts for the development of the national economy, as well as effective organizational and management mechanisms for its implementation.

From the standpoint of a systemic approach, logistics management can be presented as an ordered and managed system within which the volume and assortment of transport and logistics services are planned in accordance with the needs of the development of the economy, including foreign trade relations, the creation of conditions for the development of infrastructure, effective territorial and inter-branch distribution of transport , financial and information flows to ensure uninterrupted supply of goods in accordance with consumer needs.

Thus, the system model of logistics management is formed under the influence of the external environment and involves a controlled influence on the processes of infrastructure formation, planning, organization and the most optimal coordination and control of the movement of material, financial and information flows in accordance with the needs of the development of the economy, including foreign trade relations, for ensuring uninterrupted supply of goods in accordance with consumer needs.

In the context of the implementation of the European integration strategy, the main tasks of logistics management optimization are the gradual implementation of normative, legal, organizational and technical standards of logistics and transport in the functioning of transport and logistics systems at all levels, the activation of innovative activities and the implementation of the best world experience in the industry management system.

An important factor in the efficiency of logistics management and, at the same time, an input parameter for a managed transport and logistics system is the state of the external environment, which is formed by the following factors:

1. International relations between the country and external partners determine the conceptual framework, principles and directions of the external strategy for the development of the transport system in accordance with the current and planned international treaties, agreements and memoranda. The development of international relations contributes to the expansion of international trade in goods and services, ensures the attraction of foreign investments and stimulates increased business activity in the transport industry. As already mentioned above, currently one of the priority directions of the development of the transport and logistics system of Ukraine is its integration into the European logistics system

within the framework of the updated TEN-T policy.

2. The institutional and legal regulation of the development of transport systems and the transportation market determines the legal basis for decision-making regarding the formation and development of logistics systems, the implementation of entrepreneurial, investment and innovative activities in the industry. The priority in this area is the gradual unification of regulatory and institutional support of the transport and logistics industry with European legislation.

3. The economic situation of the country and trends in the development of the economy are important factors in the development of transport and logistics systems.

To determine the degree of influence of economic development rates on the development of the transport system, a correlation-regression analysis was conducted. As a dependent variable, the volumes of the implementation of transport services by type of economic activity H (Transport, warehousing, postal and courier activities) were taken, as an independent variable - the volumes of Ukraine's GDP in actual prices. The raw data for the analysis are given in Table 3.1

Table 3.1

Input data for the regression analysis of the impact of GDP on development

transport services

Period	Volumes of transport products, thousand UAH	GDP, million hryvnias
2010	143791493.8	1079346.00
2011	184764273.2	1299991.00
2012	212299818.6	1404669.00

2013	207138245.8	1465198.00
2014	203561259.6	1586915.00
2015	293959424.5	1988544.00
2016	365332652.7	2385367.00
2017	437226465.9	2983882.00
2018	502228629.9	3560596.00

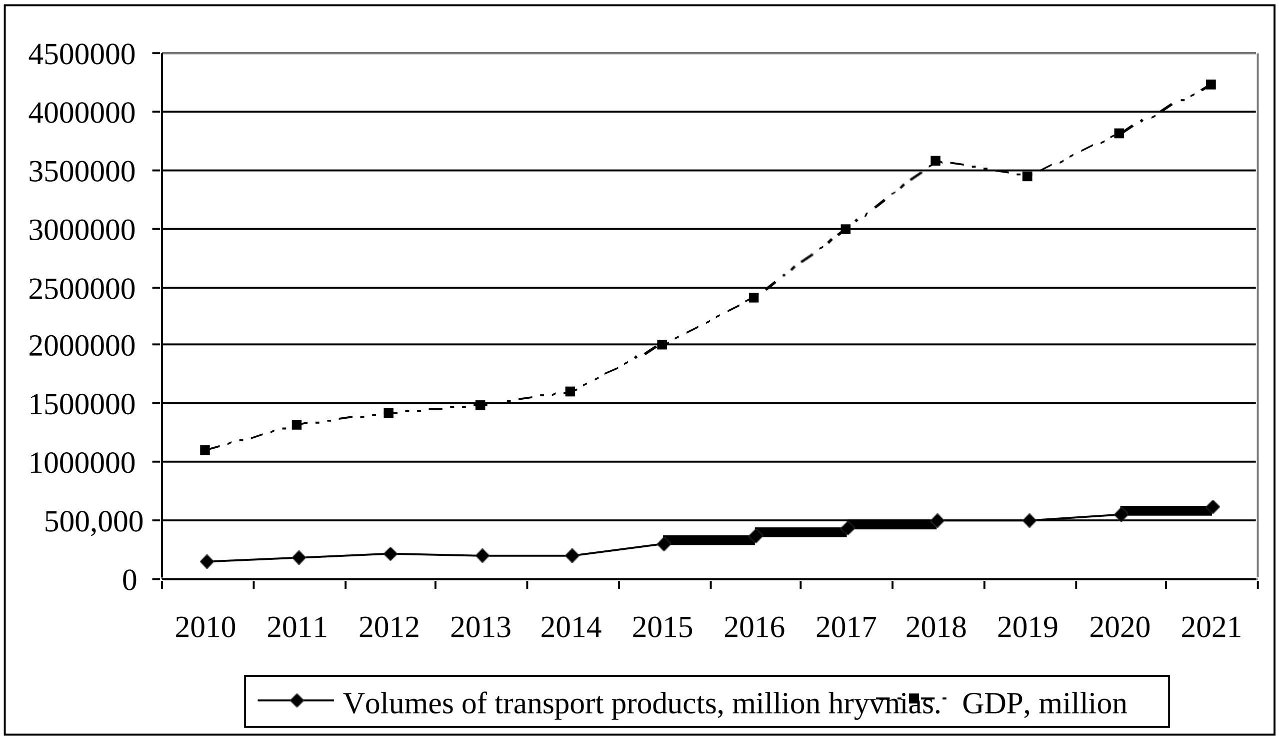
Source: State Statistics Service of Ukraine [7]

Regression analysis was performed using the "Regression analysis" function of MS Excel. Based on the results of the analysis, we can conclude that the transport system is highly dependent on GDP growth. An equation of the form is obtained:

$$U=147X-69458330 \qquad (3.1)$$

This means that with an increase in GDP by UAH 1 million, the volume of transport and logistics services increases by UAH 147.1 thousand. The presented model is characterized by a high degree of reliability and testifies to the presence of stable linear relationships between the studied indicators. This is confirmed by the high values of multiple correlation coefficients (R), which is 99% and the coefficient of determination (R2= 0.98). Verification of the model was also carried out according to Fisher's criterion, which showed the essentiality and reliability of the obtained model.

The results of the analysis can be useful in the processes of planning, forecasting the development and transformation of the transport and logistics system of Ukraine. We will calculate the forecast values of the impact of GDP on the development of transport services for 2019-2021 and display them in fig. 3.3.



Rice. 3.3. Predictive values of the influence of GDP on the development of transport services for 2019-2021

Source: predicted by the author based on fol-ly 3.1. and table 3.1.

In addition to GDP growth, the development of the transport and logistics industry is also influenced by the structure of the economy, current economic regulatory and fiscal mechanisms, inflation, the level of income of the population, etc.

3. The state of the infrastructure and resource provision of the industry form the main potential of its development and significantly affect the efficiency of logistics management. An important direction of logistics management is the organization of effective provision of the functioning of the managed system with all necessary resources, in particular personnel, financial, informational, energy and material resources. For effective provision of resources, it is necessary to form appropriate resource strategies that take into account the situation and the level of differentiation of the markets of each resource, namely: energy, financial, and labor markets.

4. The social situation of the population is an important factor that must be taken into account in logistics management, as it determines the ability of transport companies to attract qualified specialists, the acceptable level of transportation tariffs, the level of business activity in the transportation market, etc.

It is appropriate to emphasize that there is a certain feedback between logistics management and external factors at the national and regional level. In particular, infrastructure is both a prerequisite and a controlled subsystem in the field of logistics management.

Logistics management as a process is implemented through the continuous performance of interrelated functions: planning the work of management entities, organization of logistics flows, coordination of market participants in transport and logistics services, and control over the level of performance of planned indicators, as well as compliance with appropriate standards of service performance.

Logistics management efficiency criteria can be divided into internal and external. External efficiency criteria are primarily the quality of services and the level of logistics costs for consumers. External criteria of logistics management efficiency are discussed in section 2.3.

The insufficiently balanced development of various types also remains an important task of logistics management at the national level transport Fedoruk E.I. highlights the following disproportions of the transport system of Ukraine:

"The first is disproportions in the pace and scale of development of various types of transport. The most striking example is the significant lag in the development of inland water transport and the high rate of growth of motorization.

The second is insufficient development of the existing transport infrastructure, which is most acutely manifested in the discrepancy between the level of development of highways and the level of motorization and demand for automobile transportation, in a sharp reduction in the number of regional airports, as well as in the presence of "bottlenecks" at the junctions of certain types of transport.

The third is the territorial unevenness of the development of transport infrastructure" [8, p. 110-111].

The leveling of the specified disproportions lies in the plane of formation of new organizational structures that unite subjects of transport and logistics activities, various types of transport and regions. As world practice shows, such structures can be: transport hubs, transport clusters, transport and logistics centers and platforms.

In our opinion, it is expedient to create logistics platforms, the purpose of which is to create a transportation, application and monitoring management system. With the help of one tool, a full-fledged data exchange of all participants in the transport and logistics process is created. We propose to create a Ukraine-EU western logistics platform (Fig. 3.4). The central task of which will be to unite the efforts of the consignor,forwarderand the carrier of the Ukrainian side and EU countries. The main task of the Ukraine-EU Western Logistics Platform will be to expand cooperation with Germany, because in 2018, exports with this country accounted for 3.7% of the total structure of foreign trade in goods and 1.27% - imports.

Rice. 3.4. Visualization of the creation of a western logistics platform Ukraine-EU

Source: developed by the author

We propose to create central, eastern and southern logistics platforms as auxiliary ones. The central logistics platform will connect the Baltic States and Belarus. Eastern logistics platform Asian countries and the Russian Federation. Unlike the central and eastern ones, the purpose of creating the southern one is maritime transport and logistics connections.

As the experience of functioning transport and logistics centers shows, the formation of new inter-branch and inter-regional forms of organization of transport and logistics services, which involves the organization of mixed transportation, will contribute to the reduction of transport and logistics costs, shorten the terms of cargo delivery and have a positive impact on the development of the economy of the regions where they are located.

As the experience of developed countries shows, the main impetus for the transformation of logistics management is the active development of science and technology. In rapidly changing conditions, maintaining the efficiency and appropriate level of competitiveness of logistics systems depends on the availability of logistics demand forecasting systems, setting up appropriate logistics tools using innovative technologies.

Among the modern technologies implemented in the field of logistics at enterprises in developed countries, in particular in Germany, the following can be noted:

- designing logistic networks for service largecorporate clients, development of relevant supply strategies and tactics;
- formation specialized assortment logistic services,for example, agricultural, pharmaceutical, food logistics.
- development of integrated logistics systems supporting the life cycle of a product or service;
- improvement software software logistic processes withusing BIG DATA.
- development of ecological and resource-saving logistics.

Unfortunately, today the transport sector of Ukraine can be classified as one of the industries with an insufficient level of innovative activity. According to the data of the State Statistics Service [9], the share of innovatively active enterprises in the transport industry in 2014-2016 was 10% (336 enterprises). For comparison, in European countries, the share of innovative and active transport enterprises is 39% in 2016. The main types of innovation there are technological innovations carried out by 208 examined enterprises, process innovations (new transportation, delivery and logistics) □ 153 enterprises; marketing innovations 128 enterprises and product innovations 5 enterprises of the industry.

Despite the growing need to improve the competitiveness and quality of the provision of transport services, the share of innovatively active enterprises is decreasing every year. The main reasons are: a lack of funding, a low level of state support for the industry, high payback periods for innovations that prevent their implementation in an unstable environment.

Given the chronic lack of financial support for logistics enterprises, an important task of logistics management is the development and implementation of effective financial and economic mechanisms for the development of the transport sector, including:

- Involvement of external investments, loans and donor resources in the modernization of the transport sector, in particular infrastructure. It is appropriate to emphasize that such mechanisms are already in place. Support to Ukraine for the implementation of structural transformations in the field of transport and road management is provided by the European Union through sectoral budget support under the program "Support for the Implementation of the Transport Strategy of Ukraine" on the basis of the Financing Agreement; The International Bank for Reconstruction and Development, the European Investment Bank, the European Bank for Reconstruction and Development, the Government of Japan through the Japan Bank for International Cooperation under the Government's Official Development Assistance Program, the World Bank and other organizations [10]. Unfortunately, the poor management of project implementation does not allow effective reforms in the transport industry and the timely development of foreign investments. That is why the priority tasks are:

- activation of public-private partnership mechanisms to attract private investment in the development of transport infrastructure;
- corporatization of transport and logistics enterprises;
- creation of conditions for preferential lending of priority projects for the development of transport and logistics systems.

3.2. Justification of the concept of the strategic program of the transformation of logistics management in the context of the implementation of the Euro integration direction of the development of the economy

The modern practice of conducting logistics business in the countries of the European Union has shown that the main directions of development of logistics management at the state, regional and macro levels are integration, spatial concentration of transport and warehouse complexes according to the directions of the main cargo flows, and the organization of business processes related to all links of transit cargoes to minimize transport and logistics costs, ensure the most optimal routes and shorten transportation times.

The most effective direction of the development of the transport sector of Ukraine, according to world experience, can be realized through the formation of the transport and logistics system (TLS) of the country, which ensures the interaction of all participants in the transport and distribution process in organizational, economic, technical, technological and informational aspects during the movement of cargo flows, and also makes it possible to take a competitive position in the international markets of transport and logistics services [11].

At the current stage of development, the main priority of Ukrainian policy is the gradual integration of the economy into the economic systems of the EU, which involves the adaptation of the domestic transport and logistics system to European standards in all spheres: infrastructural, technical, informational, methodical. The significant backwardness of Ukraine in all the specified parameters creates obstacles for the full integration of the national transport system with the European and world systems and does not allow to fully use the powerful transit potential.

It is necessary to agree with the opinion that "... today the transport system of Ukraine does not meet the standards and requirements of the European Union and is characterized by a significant lag in terms of infrastructure, equipment and norms, therefore, at this stage of the country's TLS development, it is necessary to maximally realize the opportunities provided by cooperation with the EU in within the boundaries of the neighborhood policy, and the association for the development of Trans-European transport network routes, international transport corridors and new transnational transport and logistics axes on the territory of Ukraine. It is about the implementation of international transport and logistics projects with the involvement of EU financial instruments and the funds of EU financial institutions (EIB, EBRD)" [12, p. 98].

Comparing individual indicators of the functioning of the transport system of Ukraine and EU countries, it should be noted that despite the rather worn state of the transport infrastructure and rolling stock, Ukraine occupies a leading position in terms of the volume of cargo turnover of railway transport. In 2017, the volume of cargo turnover at Ukrzaliznytsia exceeded the average for European countries by 9 times. Table 3.3 shows the volumes of cargo turnover of rail transport in Ukraine and EU countries.

Over the period of 2010-2017, the volume of freight turnover of railway transport in Ukraine decreased by 12%, which is a significant drop if we take into account the existing potential. The main reasons for such a reduction are primarily political and economic, that is, the disruption of economic ties with Russia as a result of military aggression in the East, the reorientation of certain cargo flows to bypass the country's territory, and a decrease in the level of industrial production. Despite the decline freight turnover of railway transport, Ukraine still maintains a leading position in this indicator compared to European countries. This shows that with the creation of a favorable economic climate and the introduction of European technical and organizational standards, the transit potential of our state is high.

Table 3.3.

Freight turnover of railway transport in Ukraine and certain EU countries

countries	**2010**	**2013**	**2014**	**2015**	**2016**	**2017**	Growth 2017/2010, %
1	2	3	4	5	6	7	8
Ukraine	**218091**	**224434**	**210157**	**195054**	**187557**	**191914**	-12
Austria	19833	19356	20746	20814	21361	22256	12
Estonia	6638	4722	3256	3117	2340	2325	-65
Ireland	92	99	100	96	101	100	9
Spain	8913	9338	10385	11028	10550	10549	18
Italy	18616	19037	20157	20781	22712	22335	20
Latvia	17179	19532	19441	18906	15873	15014	-13
Lithuania	13431	13344	14307	14036	13790	15414	15
Netherlands	5925	6078	6169	6545	6641	6467	9
Germany	107317	112613	112629	116632	116164	112232	5
Poland	48705	50881	50073	50603	50650	54797	13
Portugal	2313	2290	2434	2688	2774	2751	19
Romania	12375	12941	12264	13673	13535	13782	11
Slovakia	8105	8494	8829	8439	8370	8477	5

Continuation of the table. 3.3

1	2	3	4	5	6	7	8
Slovenia	3421	3799	4110	4175	4360	5128	50
Hungary	8809	9722	10158	10010	10528	13356	52
Finland	9750	9470	9597	8468	9456	10362	6
France	29965	32230	32596	34252	32569	33442	12
Croatia	2618	2086	2119	2184	2160	2592	-1
Czech Republic	13770	13965	14575	15261	15619	15843	15
Sweden	23464	20970	21296	20699	21406	21838	-7

Source: [13]

Statistical data also show that despite the general decline in business activity in the economy, the difficult political situation due to the presence of a military conflict and annexed territories, the freight turnover of road transport in Ukraine increased by 16% during the period 2010-2017.

Compared with European countries, the freight turnover of road transport is on average 75% of the average indicator and 19% of the indicator of the leading country in terms of freight turnover in 2017, namely Poland (335,520 million tons / km). Over the period of 2010-2017, the volume of cargo turnover of road transport in Poland increased more than 2 times, which allowed it to take a leading position in Europe. One of the reasons is the geographical position of the country between the EU countries and its eastern neighbors, which, due to the better road infrastructure compared to Ukraine, allowed to reorient individual transit cargo flows. This shows that an important task of logistics management in Ukraine is the development and implementation of a strategic program for the modernization of transport infrastructure, which will allow using the available geographical advantages to consolidate the role of Ukraine as an important participant in the international transport market. Analysis of indicators of road freight turnover in Ukraine and individual EU countries for the period 2010-2017 is shown in table 3.4

Table 3.4

Car freight turnover in Ukraine and individual EU countries

countries	**2010**	**2013**	**2014**	**2015**	**2016**	**2017**	Growth in 2017/ 2010, %
Ukraine	**53918**	**58683**	**55964**	**53293**	**58030**	**62297**	16
Austria	28659	24213	25260	25458	26138	25978	-9
Estonia	5614	5986	6310	6263	6716	6189	10
Ireland	10939	9215	9751	9900	11616	11836	8
Spain	210068	192597	195767	209390	216997	231109	10
Italy	175775	127241	117813	116820	112637	119687	-32
Latvia	10590	12816	13670	14690	14227	14972	41
Lithuania	19398	26338	28067	26485	30974	39099	102
Netherlands	76836	72081	72338	68900	67779	67533	-12
Germany	313104	305744	310142	314816	315774	313149	0
Poland	202308	247594	250931	260713	290749	335220	66
Portugal	35368	36555	34863	31835	34877	34186	-3
Romania	25889	34026	35136	39023	48176	54704	111
Slovakia	27575	30147	31358	33540	36139	35411	28
Slovenia	15931	15905	16273	17909	18707	20814	31
Hungary	33721	35818	37517	38353	40002	39684	18
Finland	29532	24429	23401	24488	26846	27966	-5
France	182193	171472	165225	153580	155843	167691	-8
Croatia	8780	9133	9381	10439	11337	11834	35
Czech Republic	51832	54893	54092	58715	50315	44274	-15
Sweden	36268	33529	41964	41502	42673	41851	15

Source: [13]

Except that as shows experience others countries extremely importantthe factor of activation of the international transport potential is the solution important social, geopolitical and economic problems in Ukraine to improve the economic climate and increase the level of economic security.

Indicators of the efficiency of logistics management in the context of the integration of national transport and logistics systems into the international transportation market include indicators of import and export of transport and logistics services. In table 3.5. the dynamics of export and import volumes of transport services of Ukraine in terms of the main types of transport are given.

Table 3.5

Dynamics of export and import of transport services by main ones types of transport

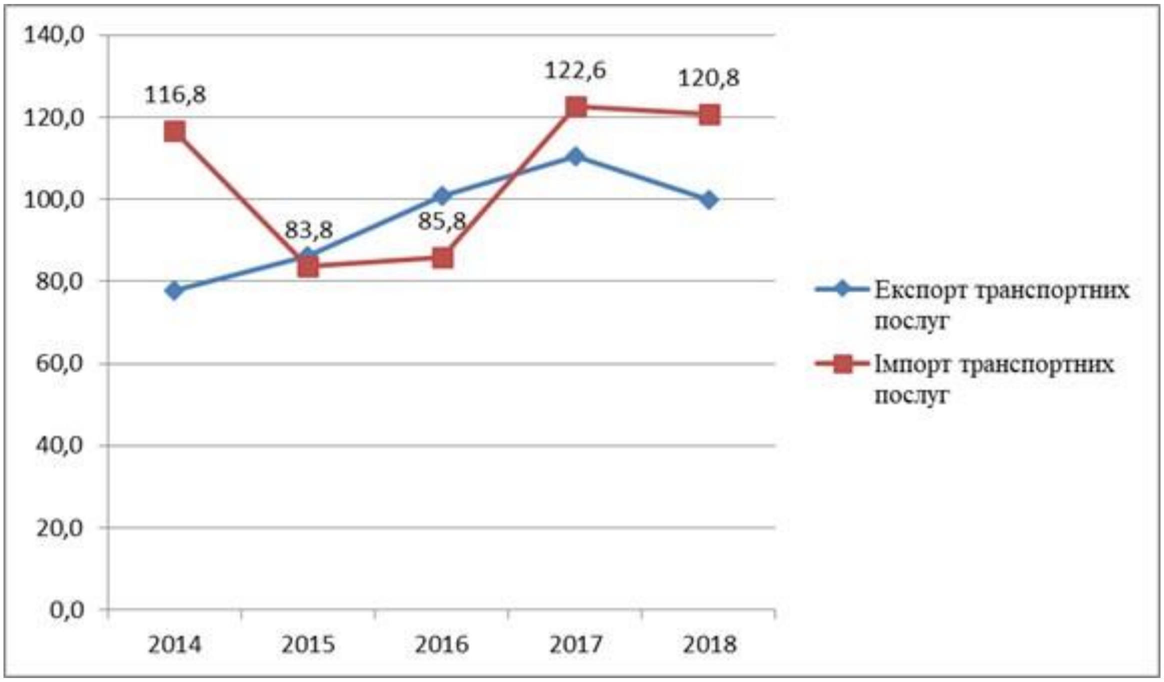
	2010	**2014**	**2015**	**2016**	**2017**	**2018**	Growth in 2018/ 2010, %
1	2	3	4	5	6	7	8
	Export						
Transportation services, thousands of dollars USA	**7835176**	**6101924**	**5263155**	**5300546**	**5861406**	**5851423**	-25
services sea transport	1234312	850878	735935	661619	612112	523257	-57
services air transport	1181930	1071263	853618	882840	1091775	1221611	3.3
services railway transport	1487123	1098831	751254	561118	580897	538914	-63
car services transport	254043	459623	249071	237949	273773	304438	20
pipeline services transport	3357723	2207902	2258042	2630686	2998248	2959048	-12
other auxiliary and additional transport services	221384	330069	341649	262868	239941	233398	5.4

Continuation of the table. 3.5

1	2	3	4	5	6	7	8
	Imports						
Transport services, thousand USD	**1178915**	**1376552**	**1153394**	**989274**	**1213074**	**1464807**	24
sea transport services	143070	243651	191729	141180	222770	222986	56
air transport services	447611	431037	466937	357465	452397	695720	55
railway services transport	463495	431305	287002	259877	297715	282974	-39
road transport services-	108526	189804	91845	114860	132793	142892	32
pipeline services transport	600.4	52588	98123.3	87229.5	[1]	[1]	-
other auxiliary and additional transport services	10180.2	15717.7	11332.6	20863.9	16592.6	23396.7	24
Balance, thousands of dollars USA	6656261	4725371	4109762	4311271	4648332	4386616	-34

[1] –no data Source: [7]

During the period 2010-2018, there was a decrease in the volume of exports of transport services of Ukraine and an increase in the import of these services by an average of 25%. The biggest decline in the export and import of transport services (Fig. 3.5) was observed in 2014, which was associated with a sharp deterioration of the geopolitical situation and the emergence of additional risks.



Rice. 3.5. Indices of increase in indicators of export and import of transport services, % compared to the previous year

In 2016-2017, there was a gradual stabilization and increase in the export of transport services (+22.6% growth), but already in 2018 these volumes decreased by 1.2%.

The export of railway transport services (-63%) during the analyzed period, as well as the export of sea transport services (-57%), are decreasing at the highest rates. The main factors of such reduction are, first of all, the loss of control over part of the seaports located on the annexed territory of Crimea, a significant deterioration of economic relations with Russia, and a decrease in the overall pace of domestic industrial production.

During the period 2010-2018, certain structural changes took place in the export and import of transport services. In particular, the volume of export of road transport services increased by 20%, the volume of provision of other additional services, among which logistics and forwarding increased by 5.4%. Export of air transport services increased by 3.3%. At the same time, a significant reduction is observed in the export of railway, sea transportation and pipeline transport.

As shown in the table, in percentage terms, certain types of transport services are being gradually replaced from export to import. This also applies primarily to rail and sea transport services and is related to the reorientation of part of the goods flows from east to west to European countries.

Despite maintaining a positive balance of foreign trade in transport services, which in 2018 amounted to USD 4,386,616 thousand. USA (299%), the size of the balance for the period since 2010 decreased by 34%. Such trends show significant underutilization of the export potential of the transport industry of Ukraine and insufficiently effective logistics management.

An important direction of the management of the national transport system in the conditions of the gradual integration of Ukraine into the European economic systems is the creation of a favorable investment climate for the large-scale attraction of investments in the development and modernization of the industry in accordance with European standards.

The analysis of capital investments in the development of the transport and logistics system of Ukraine showed that despite the nominal increase in the volume of capital investments in the development of various types of transport and the corresponding infrastructure over the period 2010-2018 by an average of 3 times, the specific weight of investments in the industry as a percentage of total investments in economy decreased from 10.4 to 8.7%.

The volumes of capital investments in freight railway (744% for 2010-2018), river freight transport (630%) and freight road transport (+360%) are increasing at the highest rates.

relevant period. As for other types of transport, the growth rate of capital investments is on average 10-20%. At the same time, the dynamic of capital investment in the development of sea transport and sea ports is negative, where the volume of capital investment during the analyzed period decreased by 41%. The dynamics of capital investments in terms of the main types of transport is illustrated in Table 3.6.

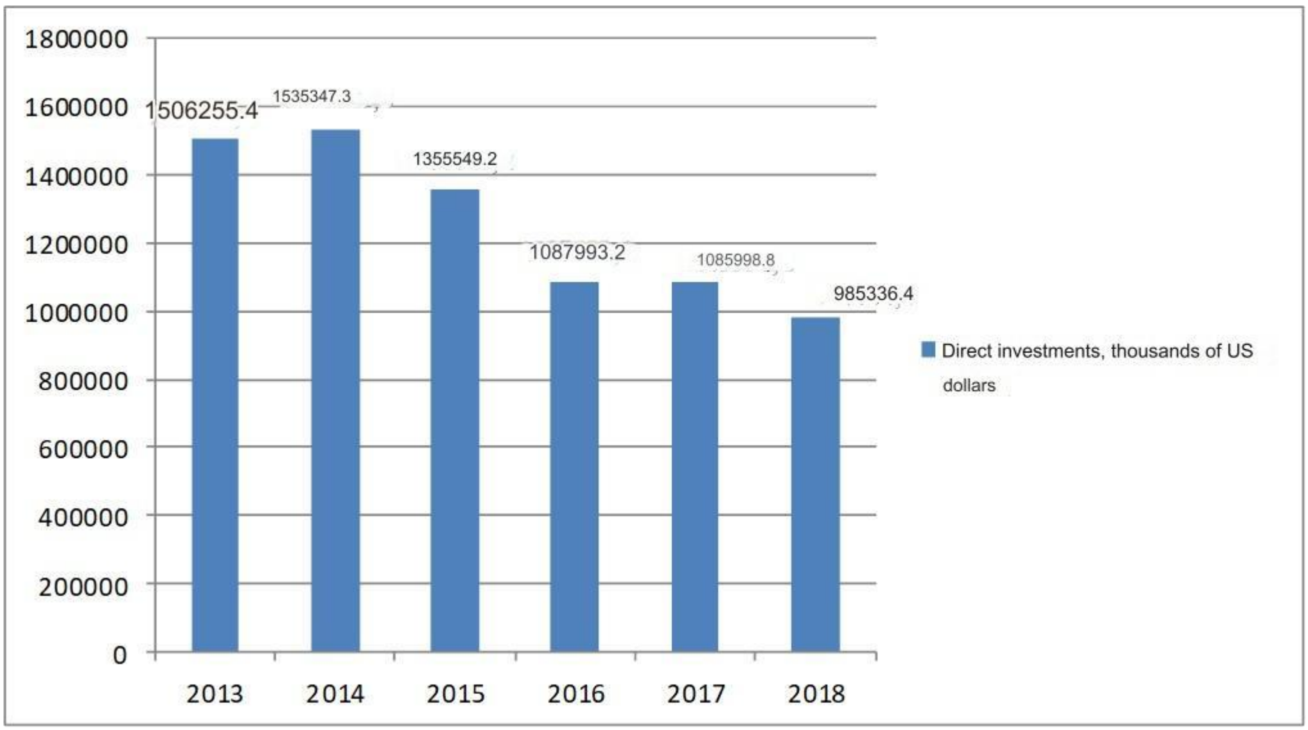
Table 3.6

Dynamics of capital investments in the development of the transport system of Ukraine, million hryvnias

Types of transport	2010	2014	2015	2016	2017	2018	Growth in 2018/ 2010, %
Transport, warehouse household, postal andcourier activity	19591.7	15498	18704	25107	37943	50078	155
Ground and pipeline transport	6770.7	3916.2	8120	15931	22245	31005	357
Cargo transport railway	2093.6	*	*	7055	11312	17690	744
Another passenger's land transport	1644.9	1045.2	1509.8	2432	4072	5271.4	220
Cargo automobiletransport, granting services transportation of things	1200.7	1470.5	3378.8	3587	4428	5819.6	384
Pipeline transport	1831.5	577.7	1574.4	2855	2432	2224.4	21
Water transport	178.5	204.8	302.5	233.9	253.7	198.2	11
Cargo transport marine	31.7	100.3	33.9	48.4	*	18.7	-41
Passenger'stransport river	121.3	*	*	0.8	*	*	-
Cargo river transport	25.3	*	268.3	184.7	222.8	177.9	603
Aviation transport	616.9	410.2	647.8	616.1	1302	1527.7	147
Warehouse household andauxiliary activity in the field transport	11901	10837	9529.5	8126	13757	16962	42

*- no data Source: [13]

An important source of development of the transport and logistics sphere is the attraction of direct foreign investments. Unfortunately, the dynamics of foreign direct investments in the industry indicate a decrease in the attractiveness of the industry on the foreign investment market, in particular, the lack of state guarantees for investors and the deterioration of the investment climate in the country. For the period of 2013-2018, except for 2014, there are negative trends in the reduction of foreign investments in the industry. In particular, during this period, the volume of direct foreign investments from the countries of the world in the domestic transport industry decreased by almost 35%. In fig.



Rice. 3.6. Direct investments (share capital) from the countries of the world in Ukrainian enterprises with the main types of economic activity "Transport, warehousing, postal and courier activities"

Source: built by the author based on data[13]

The conducted analysis showed that among the factors that reduce the efficiency of logistics management in Ukraine, the following can be distinguished:

- outdated, insufficiently modernized infrastructure of transport and logistics support, the technical and technical backlog of which negatively affects the cost of transportation, increases the terms of cargo delivery;

- insufficient pace of investments in the development of transport and logistics centers and hubs;

- the unsatisfactory operating condition of the road surface, which reduces the speed of cars, which is 2-3 times lower than in European countries;

- unsatisfactory operational condition of tracks and rolling stock, the operational age of which in some cases exceeds 60 years;

- low level of service and lack of attention to customer needs on the part of regulatory bodies and services and transport monopolies;

- insufficient level of capacity of border crossing points, as well as the complexity, duration and bureaucracy of the relevant processes;

- inconsistency and unpredictability of the tariff policy of sea trade ports and Ukrzaliznytsia;

- the absence of a single systematic strategic approach to the development of the transport and logistics system, taking into account the requirements and innovative possibilities of modernity.

The urgency of creating an electronic digital model of logistics management standards in connection with the requirement to increase the efficiency of logistics management of enterprises at the regional and state level is substantiated by the need to improve the quality of products, as well as the results of industry and logistics systems, taking into account the requirements of the world market.

The program for creating an electronic digital model of logistics management standardization is presented in the form of a project that includes the following stages:

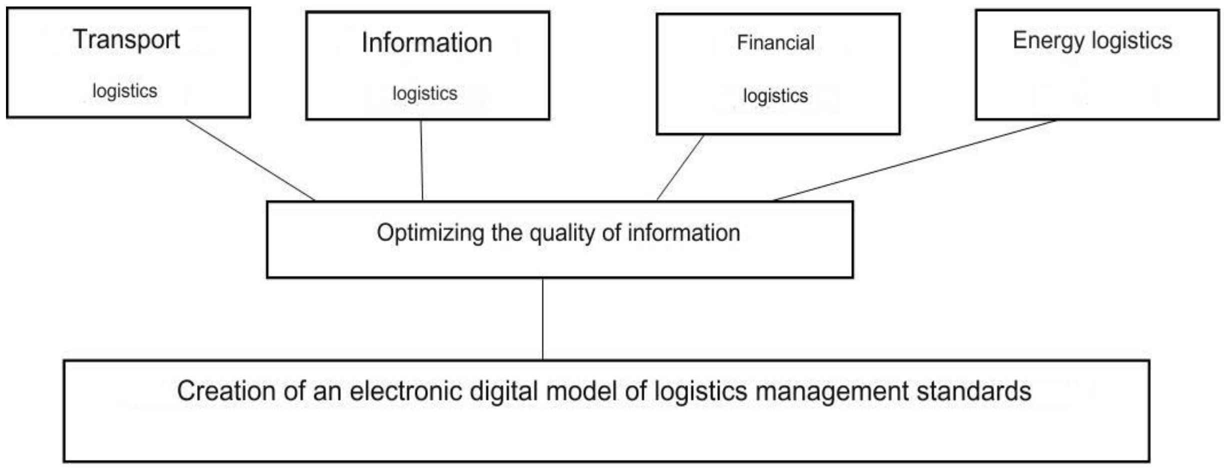
Analysis of modern methods of determining and calculating the efficiency of logistics management. It is necessary to analyze typical types of logistics (for example, transport logistics; warehouse logistics; financial logistics; energy logistics; information logistics, etc.), taking into account the characteristics of individual types of logistics and determining their characteristic economic efficiency, social, environmental efficiency, etc. . In particular, it is necessary to take into account the increase in the economic efficiency of transport logistics due to the reduction of the distance of the movement of resources; increasing the speed of their movement, as well as safety, as a result of the search and selection of rational (optimal in a certain sense) routes. This task has been solved in a first approximation, for example, at St. Petersburg University during the development of a software product for solving the traditional transport problem and finding the critical path of network graphs. When determining the efficiency of movement by sea transport, special attention should be paid to accounting for the economic speed of the ship, because for each type of transport vessel there is a certain economic speed, which is determined by the type of power plant (it is not possible to increase the speed of the ship indefinitely, because at the same time the mass of the power plant increases and there is increase in fuel costs). When calculating the economic efficiency of sea and air transport, one should take into account the geographical features of resource (cargo) transportation routes. For sea transport, this task is related to the need to use traditional sea routes, taking into account the characteristics and structural features of the ship's hull. During their operation, sea vessels must use sea channels (Suez Canal, Panama Canal, etc.) when moving from one area of the world ocean to another. When laying the routes of sea vessels, the natural conditions and meteorological conditions of the water basin are taken into account. There are up to 25 "killer" waves (about 35 m.

in height). So, for example, the district of Madagascar is dangerous for container ships, and the routes of their movement traditionally bypass this area, increasing the paths they follow.

Peculiarities of sea channels lead to structural features of ships transporting goods along them. So, for example, the Panama Canal requires taking into account the need to lock ships and tow ships using land locomotives. These requirements are related to the difference in height of the water surface of the Panama Canal in some of its sections. For air transport, special areas of turbulence existence, mountainous landscape (Tibet and Himalayas), location, active volcanoes, and so on are taken into account. For railway transport, the choice of the route of movement of railway stock can lead to shortening of the journey and reduction of fuel or electricity consumption directly to cover the distance, as well as reduction of the time of parking of railway stock at intermediate stations to pass oncoming or high-speed trains.

For road transport, economic efficiency may depend on the direct shortening of the route, the choice of road routes with better road surface characteristics, etc. traffic conditions along the route.

For a more thorough and detailed consideration (construction) of the concept of logistics management standardization, we will use information visualization in the form of a graphic representation, that is, in the form of graphs and block diagrams. In fig. 3.7. a reinforced (generalized) block diagram of the technology for building the concept of logistics management standardization is presented. The relationship between the stages is shown, and the ways and tools for implementing the provisions and stages of software solutions of the concepts are shown.



Rice. 3.7. Scheme of the technology for building the logistics management standardization concept

Management of the project of creating an electronic digital model of logistics management standards can be carried out using the following mechanism.

1. For energy logistics management, it is necessary to take into account energy losses, both during its production at thermal nuclear hydrotechnical and other stations by the energy producer, and losses during energy transportation from the producer to the consumer. This algorithm, to a certain extent, was developed and is being developed taking into account modern requirements for energy management technology and logistics.

2. For financial logistics, economic efficiency can be determined on the basis of risk accounting in the production of financial operations, adopted at the level of the state's financial policy.

3. Information logistics is characterized by the quality of information transmitted from information sources to their consumers. Here, errors arising in the very structure of the information system should be taken into account (such errors can be made purposefully with the participation of a person). Another type of error can occur as a result of interface imperfection (when transferring

information in the place and during the communication of information systems). The third type of error can occur as a result of a technical failure in the information system and its technical elements, for example, at the time of natural phenomena (for example, earthquakes) or a purposeful external action of a subjective nature (for example, hacker attacks).

4. The project management mechanism should contain the formalization of determining the effectiveness of logistics management of various types in its essence. The definition of economic, social, energy, environmental, and other types of efficiency should be formalized.

5. An important stage of the project is solving the problem of connection, which consists in eliminating errors in the transmission of information from one information system to another.

6. To solve the problem of the quality of logistics management, the project envisages the development and creation of an electronic digital model of the logistics management standard. This model should be typical and provide for modification according to various types of logistics (water transport, rail, road, air). Standard standards should be provided for both technical means and logistical operations. Technical means are, for example, railway wagons, cars and ships. Logistics operations - this is the delivery of goods to storage and storage places, for example, in a sea port; standards for warehouses and conditions for storing goods in warehouses; cargo transshipment operations, for example, grain loading from near-port coastal elevators; the operation of transshipment of goods at sea from one vessel to another, or a specialized berth located in the open sea.

7. The project should contain an electronic template of standards, which should include the following sections:

7.1. Scope of application of standards, for example, general requirements for logistics management operations.

7.2. Restrictions and requirements for the conditions of the operation.

7.3. Field of application, for example, railway transport.

7.4. Technical requirements for the performance of the operation, for example, the destination of cargo movement (type of cargo - loose, organic or inorganic - grain).

7.5. Means of transshipment of cargo, for example, using port overhead cranes or conveyors.

7.6. The list of technical means of grasping the overloaded cargo, for example, a bucket or grapple, etc.

7.7. List of means of mechanization of cargo transshipment.

7.8. Means of control of the operation.

7.9. Means of information transfer to the information system of the seaport.

7.10. Ensuring the safety of the logistics operation.

7.11. Environmental safety.

7.12. The project involves the development of codes of bibliographic references of standards taking into account the experience of world practice, for example, similar systems of codes used in patents for inventions.

8. A professional standard should be developed, for example, in the form of a list of requirements for the logistics management profession.

9. It is necessary to develop a standard for specialized education "logistics management".

10. The organization of dual training in the specialty "Logistics Management", which consists in simultaneous training according to the curriculum in a higher educational institution and practical work in the field of logistics in accordance with the chosen specialization in a certain subject.

One of the directions of transformation of logistics management of sea transportation with the aimincreasing the efficiency and effectiveness of the logistics management of the transportation of goods by container ships by sea– τηισ developmentof the logistics scheme of transporting containers by sea with their temporary storage at nodal point moorings, which are located at the intersections of container ship routes. Patent No. 138059 dated November 25, 2019 was obtained for this useful model.

The useful model refers to the area of warehousing, storage and transportation of goods by sea using containers. There is a known way of transporting cargo containers by sea on ships with their placement in the holds and on the main deck. The disadvantage of this method is insufficient efficiency in connection with non-compact placement of containers. In this case, there is an irrational use of the overall dimensions of the ships that transport these cargoes, great labor intensity during loading and unloading, as well as the need to use special devices for fixing containers.

The technical and economic effect of the application of the declared useful model consists in increasing the efficiency and effectiveness of the transportation of cargo by container ships by sea. The effect is achieved due to the application of the logistics scheme of transporting containers by sea with their temporary storage at nodal point moorings, which are located at the intersections of the routes of container carriers. The movement of goods from the nodal berth to the delivery port is carried out with the help of a container ship that follows the appropriate route.

The task is solved due to the application of a logistic scheme for the transportation of goods with their temporary storage at nodal point berths, which are located at the intersections of the routes of container carriers.

The nodal point mooring in the traditional version receives oil and gas products, which are then moved to the shore using an underwater pipeline. The novelty of the useful model is the use of nodal point moorings for a new purpose for storage,

storage and transshipment of containers, which increases the quality of service provision and the achievement of other technical and economic effects. At the same time, there is fuel saving and a reduction in the parking time of container ships at the quay walls in the ports of departure. As a result, the efficiency of the delivery of containers to their destination increases, due to the reduction of their transportation path, since transshipment is carried out at nodal point moorings in the places where container ship routes cross. This leads to a synergy effect, which consists in the emergence of the possibility of mass or large-scale movement of cargo in containers through nodal point moorings in areas where this cargo is needed to eliminate the plight of the population.

The nodal point mooring can be located in neutral waters, where there is no border and customs control (in this case, no customs declaration is issued), so the interface problem (connection problem) is partially solved due to the elimination of objective and subjective errors when transmitting data from one information system to another.

The transport system of transporting containers by sea is implemented by known technical means: container ships, port and ship devices.

In figure 3.8. the logistics scheme of transporting goods by sea using container carriers is presented (two linear routes of container transportation are shown, which intersect in the area of the location of the nodal point berth).

The transport system of the transportation of cargo containers by sea consists of sea ports of dispatch 1, 2, delivery ports 3, 4 and sea container ships 5, 6, while in the sea, in the areas of intersection of cargo transportation routes, nodal point moorings 7 are placed for warehousing and temporary storage of cargo , stocks of fuel, lubricants, provisions and other ship supplies.

The transport system of transporting containers by sea is implemented in the following way.

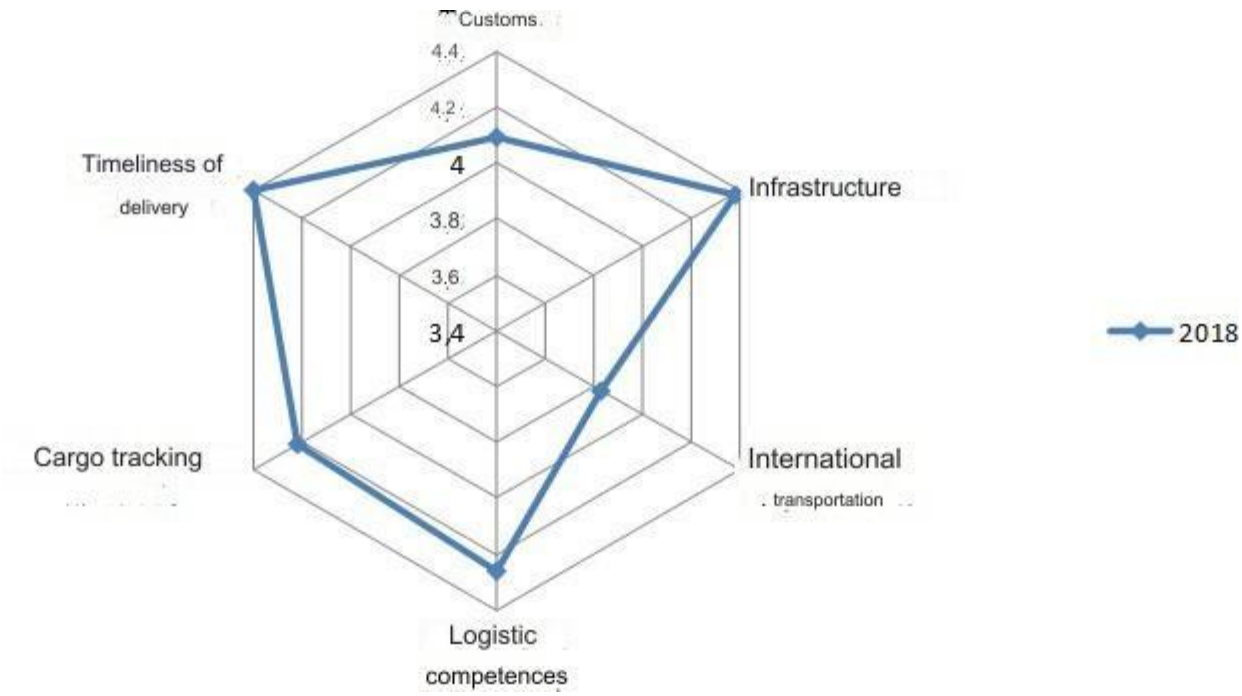
Cargo containers, after delivery to the sea port of shipment 1, are stored and stored on its territory.

In the sea port of departure 1, containers are loaded onto the container ship of the main route 5, intended for ports 3 (the main linear route) and 4 (cargo destined for other routes). Loading is carried out using port and ship devices. Then their transportation by sea is carried out according to the established route of transportation of the main part of the cargo to the port of delivery of the 3 main route. In the area where the routes of container ships cross, containers with cargo transported to another port of delivery 4 are transferred to the nodal point berth 7. They are stored and temporarily stored there until the arrival of container ship 6 of another route, which follows from port 2 in the direction of another port of delivery 4. Container ship 6 of another route is moored to nodal point berth 7, where cargo is unloaded for delivery to port 3 of the main route, and containers stored at nodal point berth 7 for delivery port 4 of another route are transferred to container ship 6 of the second route. Refueling of ships with fuel, lubricants, loading of provisions and other ship supplies can be carried out at the nodal point berth.

The technical and economic effect of the application of the declared useful model consists in increasing the efficiency and effectiveness of the transportation of cargo by container ships by sea. The effect is achieved due to the application of the logistics scheme of transporting containers by sea with their temporary storage at nodal point moorings, which are located at the intersections of the routes of container carriers. The movement of goods from the nodal berth to the delivery port is carried out with the help of a container ship that follows the appropriate route.

In the modern conditions of transformational processes, which are characteristic of the development of the national economy, one of the urgent tasks is the development of a comprehensive strategic vision and corresponding strategies for the development of individual sectors, in particular the transport sector.

Germany's experience in strategic management of the development of transport and logistics systems is interesting. It should be noted that according to the latest rating published in 2018 [14], Germany in terms of logistics efficiency took 1st place in the world, having scored 4.19 points. It is worth noting that Germany is the world leader in terms of logistics for 3 seasons in a row, namely in the 2014, 2016 and 2018 ratings. Let's consider the ratings that Germany received for individual components of the rating in 2018 (Fig. 3.9).



Rice. 3.9 Assessments of the state of logistics management in Germany by individual components of LPI

Source: [14]

Germany has the highest scores for indicators of transport infrastructure and timeliness of cargo delivery. Comparatively lower scores were obtained for the category of international transportation and customs work, which is due to the presence of additional customs procedures and federal laws regulating international transportation compared to some European countries.

The high level of efficiency of the transport and logistics system in Germany is primarily ensured by the effective spatial placement of transport and logistics centers. In particular, about 80% of logistics centers located along the railway infrastructure, which allows, firstly, to receive additional investments in the development of logistics centers due to the co-financing of projects from the profit of the railway and motor transport enterprises, to create a unified software for planning routes and deliveries. All of this provides a synergy effect and allows you to significantly reduce transport and logistics costs, as well as carry out combined transportation (more than 65% of transport and logistics centers are focused on the use of multimodal transportation).

It is worth noting that the efficiency of the development of the transport and logistics system in Germany is ensured by significant support of the state at all levels. The peculiarities of state regulation of the development of transport and logistics infrastructure in Germany include:

- the important role of the state, as well as the governing bodies of federal lands, which take equal participation in the financing and management of transport infrastructure construction projects, in particular at the initial stages;

- the effectiveness of mechanisms for financing infrastructure projects, which involve direct financing from the state budget, subsidies from the budgets of federal lands, as well as attracting private capital under the conditions of public-private partnership;

- clearly developed legislation regulating relations in the field of financing, management and provision of transport and logistics services.

The system of the Federal Ministry of Transport of Germany includes the Central Administration, which takes care of personnel policy, social security, finance, security and law, management, transport policy and economy, rail transport and inland shipping, sea transport, air transport, highways and waterways. To coordinate federal and regional transport policy in

Germany has a consultative body - the Conference of Land Transport Ministers [15, p. 19].

After Germany, the leading places in the 2018 rating were taken by the Netherlands (4.07), Sweden (4.07), Belgium (4.05) and Singapore (4.05). As you can see, most of the countries leading the logistics efficiency rating are European countries. High positions in the rating are ensured primarily by the implementation of a joint strategy for the development of transport and logistics systems, which was named "Eurologistics".

The basis of the transport and logistics system of Europe is the network of Transport and Logistics Centers. As A.V. Kuzmenko notes. "Current transport and logistics centers of Europe are specialized nodal logistics enterprises that perform the function of crossing communication flows and ensure the provision of a wide range of transport and logistics services, characterized by: coordinating the work of various types of transport; with cargo service (carries out loading and unloading operations, transshipment of cargo, their storage, cargo processing and storage); with freight forwarding and forwarding; with registration of customs and transport documentation; with the provision of a full range of service and commercial and business services, including banking, information, consulting and analytical services, etc." [16].

One of the strategic prospects for the development of transport and logistics activities in the EU is the construction of a single Trans-European transport network TEN-T. The project started in 2014 and has ambitious goals, namely to form a single transport network that will connect all points of the continent and ensure high speed movement of passengers and cargo.

According to strategic goals, already in 2050, moving across the EU from North to South or from West to East will take an average of half an hour, and the new the transport network will connect 94 ports, 38 airports and 15,000 km. modernized high-speed railways.

The main goals of implementing the TEN-T strategy:

- elimination of "bottlenecks" that create obstacles to the efficient movement of transport and functioning of the market;
- creation of a system of integrated complex coordination of various types of transport;
- unification of transport systems and infrastructure of EU member states;
- elimination of technical and tariff barriers;
- transition of transport to the use of ecologically clean energy;
- effective using transport infrastructure on basisimplementation of innovative navigation systems;
- increasing the safety of transport;
- integration of urban transport networks in TEN-T

More than 24 billion euros have been allocated for the implementation of the project. The implementation of the main part of the project was planned to be completed in 2020. According to the European Commission, as of the end of 2018, the average level of project readiness is 77%. As part of the TEN-T project, more than 1,998 million euros have been allocated to the development of Germany's transport and logistics infrastructure, in particular:

1) Development and implementation of new technologies in transport – 16 projects for a total of 95 million euros;

2) European Railway Traffic Management System (ERTMS) - 7 projects with a total cost of EUR 103 million;

3) SESAR "Single European Sky" project - 7 projects with a total cost of 212.5 million euros;

4) Intelligent transport services (ITS) □ 9 projects worth 52.7 million. Euro;

5) Pre-approved projects along the corridors of the basic network 16 projects for a total amount of 1534 million euros [17].

In addition, according to the Federal Ministry of Transport of Germany, in order to preserve the competitiveness of the transport system, measures are being developed to maximize investments in the industry. Only in the period of 2016-2018, the amount of investments in infrastructure development increased by 40% and amounted to 14 billion euros [18].

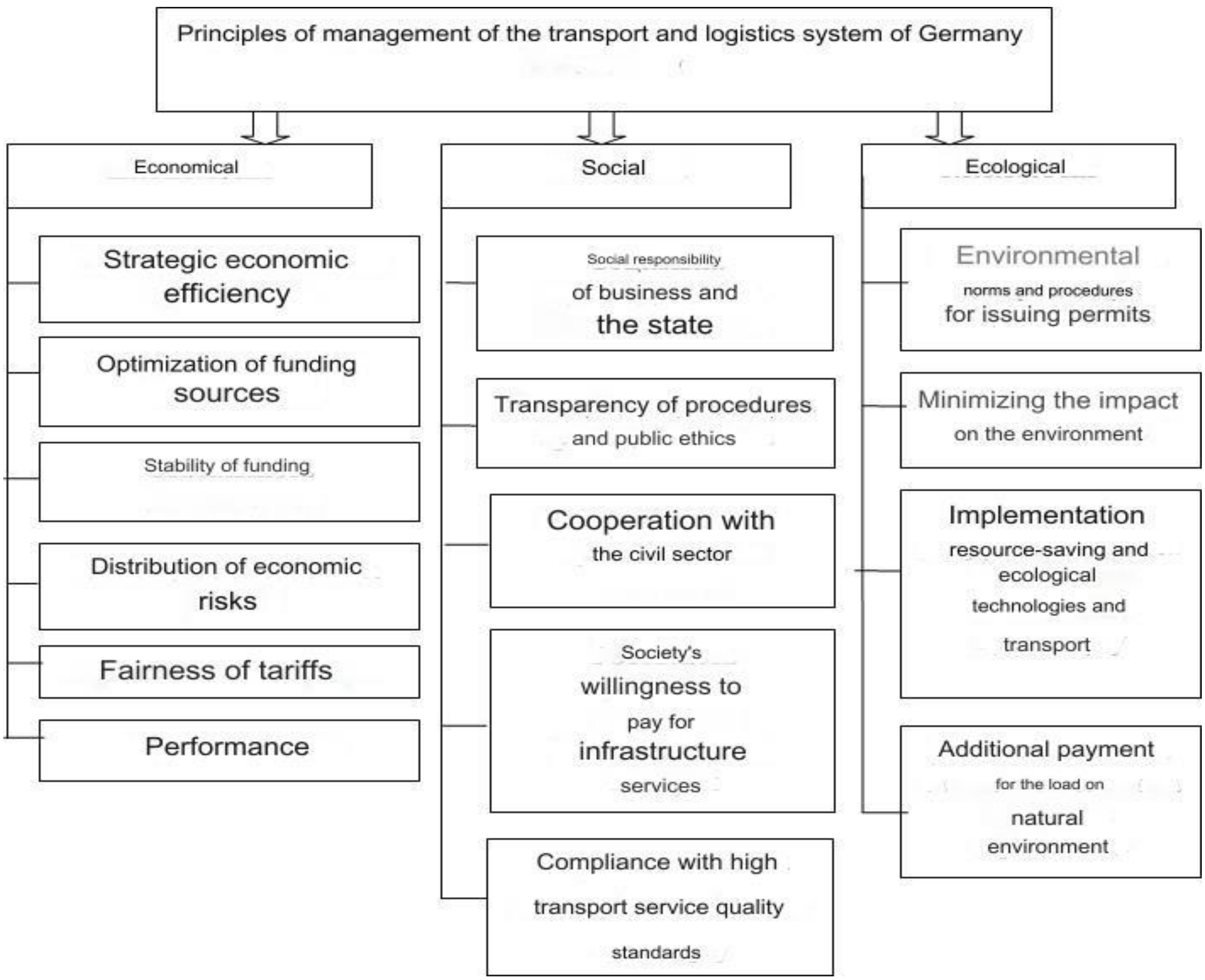
In 2016, a federal transport infrastructure development plan FTIP until 2030 was developed for the effective implementation of state and European policy in the field of transport. The new FTIP includes not only investments in structural maintenance and repair of transport infrastructure, but also more than 1,000 projects of modernization and construction of new facilities. The total level of financing of activities and projects provided for in the plan is 269.6 billion euros. Of them: financing of road infrastructure 49.3%; railways - 41.6%, waterways - 9.1%.

The study of the procedures for the formation of a transport plan in Germany also allowed us to draw conclusions about the significant democratization of this process. In particular, the first stage of the development of the plan is a public discussion of the results of the implementation of the previous plan, its effectiveness, and the systematization of civil society proposals for the improvement of individual processes, projects, or services.

At the second stage, taking into account the opinion of the public, working expert groups were created, which develop new options and concepts, which are discussed at a specialized forum, based on the results of which 12 strategic concepts for the development of transport for the future were considered. On the basis of the considered proposals, a master plan was developed, which was presented for hearings and approval in the parliament.

That is, we can say that the process of infrastructure development planning is carried out according to the bottom-up principle. At the same time, public opinion, consistency with regional authorities and the absence of contradictions with the Strategic Infrastructure Development Plan at the level of the European Commission are important.

According to the results of the study of the effectiveness of logistics management in Germany, the main principles on which the management of the transport and logistics system is based are systematized (Fig. 3.10).



Rice. 3.10. Principles of management of the transport and logistics system of Germany

Source: systematized by the author

Adherence to the specified principles in Ukraine will increase the efficiency of logistics management at all levels of management and ensure its effectiveness. Practice has shown that most of the principles of forming strategies and plans for the development of the transport sector are not taken into account. In particular, there are no consultations and discussions with the public on the main problems of transport, the absence of a transparent policy on the formation of tariffs for passenger and cargo transportation, neglect of the level of quality of transport services, in particular in state transport monopolies, non-compliance with environmental standards in the process of construction and operation of transport infrastructure facilities and transport

Neglect of economic principles negatively affects the investment attractiveness of the transport sector. In particular, lack of state guarantees to investors, insufficient level of risk protection, non-transparency of tender procedures, imperfection of legislation in the field of implementation of public-private partnership projects, etc.

In the conditions of the implementation of the policy of gradual integration of the economic system of Ukraine into the EU, the formation of a comprehensive strategic program for the development of transport in Ukraine must take into account the requirements, tasks and norms laid down in the TEN-T Strategy, which will create basic prerequisites for gradual integration into this structure. In this context, we agree with the opinion of N.O. Fedyai that "The integration of the Ukrainian transport network into the European one should become a strategic priority for the long-term period for the government of Ukraine and the relevant ministry in particular. It is expected that this process may drag on for 10 years: firstly, this is the maximum period of implementation of EU legislation within the framework of fulfilling the requirements of the Association Agreement between Ukraine and the EU, and secondly, the modernization of transport infrastructure in accordance with EU requirements is a rather long-term process. Yes, the EU has developed a tool for institutional cooperation between state administrations of EU member states and beneficiary countries (the list of beneficiaries includes, among others, countries covered by the European Neighborhood Policy) - the TWINNING project." [19].

So, the basic directions of the European transport strategy, which must be taken into account when developing a comprehensive program for the development of transport in Ukraine, are:

1) Formation of effective investment attraction mechanisms and procedures for financing basic infrastructure projects;

2) Organizational regulation of project implementation to eliminate bottlenecks and disproportions in transport provision between different types of transport, regions, as well as between basic and complex networks;

3) Achieving cross-border, technical and organizational compatibility with the networks of neighboring countries.

The Cabinet of Ministers of Ukraine approved the National Transport Strategy until 2030, which outlines the main priorities for the development of the transport and logistics system and generally corresponds to the general priorities adopted in the EU:

"-efficiency of state management of the transport sector;

- provision of quality transportation services;
- ensuring stable financing of the transport industry;
- increasing safety and reliability of transportation;
- improvement of urban mobility and regional integration of Ukraine [20].

At the same time, there are no clear and consistent plans in the Strategy, and there are no mechanisms for its implementation. The strategy is not supported by reasonable calculations, does not contain defined sources of funding. In our opinion, the effectiveness of the implementation of the transport development strategy requires the development of a comprehensive model of strategic management of the national transport a logistics system in which the distribution of functions, tasks and responsibilities is carried out organically both vertically (state-region (community) □ enterprise) and horizontally between branches. Figure 3.11 shows a conceptual model of strategic management of the transport and logistics system of Ukraine.

The strategic vision of the development of the national transport and logistics system is a project of its future structure, spatial arrangement of objects and relevant communications, the level of development of which corresponds to the strategic goals of the country's development, taking into account the prospects of inclusion in the European and world transport and logistics systems and is based on the results of a comprehensive assessment of the existing geographical, resource and economic potential.

The strategic priorities formulated in the National Transport Strategy until 2030 are the basic basis for the formation of strategic goals and their breakdown into specific tasks, projects and programs.

An important element of the conceptual level is the assessment of socio-economic, geopolitical, institutional and legal, resource conditions for the implementation of the strategy and the development of appropriate mechanisms for bringing them into line with the requirements for the implementation of the strategy.

At the sectoral level, the directions of development, optimization and modernization of infrastructural support are determined in terms of types of transport, taking into account their current state, existing potential, forecast development trends and future needs.

CONCLUSIONS

The study summarizes the existing and proposed new approaches to solving an important scientific problem - substantiation of the theoretical and methodological foundations of the transformation of logistics management of Ukraine in the context of the implementation of the European integration strategy. The following theoretical-methodical and scientific-applied conclusions were formed, namely:

1. The indicators of the assessment of interregional asymmetries in the development of transport and logistics activities are systematized according to two criteria: the state of infrastructural support of transport and logistics activities and the efficiency of the functioning of transport enterprises. A comparative assessment of interregional asymmetries in the efficiency of transport and logistics management relative to the reference value for individual indicators was carried out, the strengths and weaknesses of infrastructural support and the efficiency of logistics management in the regions of Ukraine were determined. The conducted calculations showed significant asymmetries in the regional development of motor transport enterprises in the context of the efficiency and productivity of their operation. Despite the high values of individual indicators, the complex value of the efficiency of the development of transport and logistics enterprises is quite low and shows significant interregional asymmetries. The highest indicators in 2018 (40-58%) are observed in Dnipropetrovsk, Kyiv, Odesa, Mykolaiv and Kharkiv regions, that is, in regions where important transport hubs are concentrated and various types of transport are developed. Therefore, performance indicators of motor transport and logistics enterprises depend on external and internal factors. The external ones primarily include the location of the enterprise in relation to potential consumers, the state of transport

infrastructure, the level of economic development in the country. Internal factors should include the evaluation of the effectiveness of planning (operational and strategic) functions, the organization of logistics services, employee motivation and enterprise control. Therefore, improving the functions and structure of logistics management at domestic enterprises is one of the important tasks, which will increase the profitability of the transport and logistics industry and its competitiveness in the international transportation world.

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