3.2 Conceptual approaches to determining the economic essence of the logistics system category

At present, the problems of transformation of logistics systems of different levels are becoming especially relevant. This is due to the significant influence of exogenous and endogenous factors of the institutional environment and the emergence of new challenges over time, including the intensification of globalization and digitalization in various economic activities [63-70], the transition to network forms of partnership [71-76], implementation of concepts “green” growth [77-82] and closed-loop economy [83-84], etc.

Considering the economic object as a complex system, it is advisable to have a completely reliable idea of its structure. The methodological basis for the formation of the idea is a systematic approach, according to which it is necessary to consider the system as a whole that has properties that are absent in its components. It is the dissimilarity of the elements of the system and the effectiveness of synergistic connections that create the conditions for the integration of the object into a single whole - the system.

According to the encyclopaedic dictionary, the concept of “system” (from the Greek – a whole, composed of parts, connections) – is a set of elements that are in relationships and connections with each other and create certain integrity and unity. This definition is quite generalized and reflects our subconscious ideas about the system. It is a set of interacting elements and relations between them, which generally perform a certain function; a set of elements that are in the appropriate relationships and connections with each other and form certain integrity that provides the emergent properties of the system.

Research has accumulated many definitions of the system that need to be generalized for further use, the most common of which are those that understand the system as a holistic interdependent set of objects interconnected; a holistic set of elements; the order (plan, classification), according to which a group of concepts is located to form a single whole; a set of interdependent, in some way organized and

interacting objects; organized many structural elements that are interconnected and perform certain functions; a set of selectively involved components, in which the interaction and relationships acquire the character of mutual cooperation of components in obtaining a fixed useful result; a set of interdependent elements that is isolated from the environment and interacts with it as a whole.

In a general sense, an economic system is a complex system that partially or completely covers all economic processes (supply, exchange, production, distribution, and consumption of finished products and services).

In the sources, you can find many concepts of the term "logistics system". Their analysis allows us to conclude that today there is no single point of view on the formulation of this definition (*Table 1*). This is due, firstly, to the fact that researchers are representatives of different scientific schools with their approaches and characteristics. And, secondly, the ambiguity and multifaceted nature of the concept of "logistics system".

Table 1 – Approaches to the economic interpretation of the concept of "logistics system"

Representative of the scientific school	Definition
1	*2*
D. Bowersox	the process that connects the company with its customers and consumers
A. Korzeniowski	a set of integrated logistics processes, interconnected, which are in some connection with the external environment
P. Blaik	a set of logistical elements, the connection between which is specified through the processes of transformation
S. Strykowski	the infrastructure needed for the supply chain to function and to manage it effectively
S. Abt	specially organized and integrated flows of materials and products, as well as the corresponding flows of information to optimize the process of supply chain management (including through automatic product identification, computer simulation, controlling, electronic data exchange, and integrated economic accounting)
S. Owczarowski	a set of certain, relevant theories, and solutions that are necessary for the optimal implementation of tasks within specific logistics chains on the scale of national and international logistics from the moment of entry into the system
A. Hadzhynskyi M. Denysenko P. Levkovets L. Mykhailova	adaptive feedback system, which performs certain logistic functions (operations), consists of subsystems and has developed internal system connections and connections with the external environment

Continuation of the Table 1

1	*2*
L. Mirotin A. Albekov	adaptive feedback system that performs certain logistics functions and logistics operations, usually consisting of several sub-systems and has well-developed links with the external environment
V. Serhieiev	a relatively stable set of units (structural/functional units of the enterprise, as well as suppliers, consumers, and logistics intermediaries), which are interconnected and united by single management of the logistics process to implement the corporate strategy of the business organization
Yu. Nerush	a system that organizes the free distribution and exchange of products in such a way as to ensure optimal supply and demand and optimizes the operation of component subsystems (some units determine the required volume of products for continuous operation – supply, others – distribute products – sales, others products from suppliers to consumers, fourth – collect information about suppliers, market, consumers, etc.)
V. Dybska	a relatively stable set of functional units of the enterprise, as well as suppliers, consumers, and logistics intermediaries, combined in the main or related flows and combined into single management to implement a strategic logistics plan
M. Afanasiev	any integral social large system that seeks and finds the most effective form of systemic organization of its functioning and development
A. Parfonov	an important part of the market mechanism of expanded reproduction, formed in order to realize and reconcile the economic interests of the direct participants in business processes through the most efficient use of public resources available in a given
B. Plotkin	historical stage in economic conditions
S. Uvarov	complete and reliable provision of consumers with the means of production in market conditions
A. Chudakov	a system, the elements of which are material, physical, and information flows, which are logistic operations that connect these elements, based on common goals and performance criteria
T. Alesynska	dynamic, open, stochastic, adaptive complex or large feedback system that performs certain logistics functions
S. Nahlovskyi	a set of elements that are in certain functional connections and relationships with each other, forming certain integrity and unity
Ye. Krykavskyi N. Chornopyska	specially organized integration of logistics elements (units) within a certain economic system to optimize the processes of material flow transformation
N. Chukhrai R. Potora	expediently organized and connected within a certain economic system physical flow of goods, accompanied by the flow of funds and information
I. Karp M. Oklander	organizational and managerial coordination mechanism, which allows achieving the effect due to the clear coordination of actions of specialists of various services involved in the management of the material flow
M. Oklander	organizational and managerial mechanism related to achieving the required level of integration of logistics functions through organizational changes in the management structure and implementation of specially designed management procedures (operating systems), based on supply planning, production support and physical distribution as a single material flow

Continuation of the Table 1

1	*2*
I. Smirnov	complex organizational-complete (structured) economic system, which consists of interconnected in a single process of management of material and accompanying flows of elements – links, the set of which, the boundaries and objectives of the operation are combined with internal goals of the business organization and external goals
A. Kalchenko	an organizational and economic mechanism for managing material and information flows
V. Kyslyi	targeted integration of logistics elements within a certain economic system in order to optimize the processes of material flow transformation
I. Bazhyn	a set of interdependent elements, such as people, structure, and technology, which are focused on achieving different goals in a changing environment
Yu. Ponomarova	a complex system consisting of a set of elements, yes so-called parts of the logistics system, between which certain functional connections and relationships are established
O. Sumets	adapted (self-adjusting and self-organized) feedback system that performs logistics functions and logistics operations and usually consists of several systems and has well-developed links with the external environment
N. Seleznova	a complex structured economic system consisting of elements (subsystems), interconnected in the process of managing the movement of material, information, financial and labour flows, have high adaptive properties and connection with the external environment
O. Moroz	complex open economic systems that include interacting with each other and the external environment subsystems that ensure the functioning of economic relations of industries and enterprises in the region in regional logistics chains, the formation of which is aimed at achieving socio-economic development goals based on optimizing economic flows
O. Korniietskyi	system-forming elements that are closely interconnected and interdependent, that have ordered connections and form a certain structure with predetermined features
T. Dudar	separate elements of links between which certain functional communications are established
L. Zaburanna O. Hlushchenko	a set of interconnected logistics subsystems internal production links and operate to achieve a single logistical goal of the enterprise
L. Zaburanna A. Kulik	a set of logistics subsystems that are interconnected by internal production links, organized in accordance with the rules and procedures of the enterprise or their association within a defined area, and operate to achieve a single logistical goal of the enterprise or their association
A. Bakuta	a set of interdependent elements within a particular economic system, the action of which is aimed at optimizing the movement of material, information and financial flows and optimizing the costs associated with the movement of these flows
D. Kostohlodov I. Savvidi V. Stakhanov	a set of interconnected and interacting participants in economic flows, united by the unity of goals and economic interests
M. Drohomyretska A. Zoria	orderly structure, which includes the planning and implementation of the movement and development of aggregate resource potential, organized in the form of logistics flow, starting with the receipt of resources from the external environment, and ending with the sale of finished products to consumers

The end of the Table 1

1	*2*
R. Ivut	specially organized integration of logistics systems within a certain economic system to optimize the processes of material flow transformation
N. Pytuliak	an orderly highly integrated system, with which it is possible to plan, manage and implement logistics functions and tasks
N. Metelenko K. Taraban	a complex multilevel system containing material and technical, organizational and economic, socio-psychological and regulatory subsystems, combined in a single continuous process of industrial enterprise management, takes into account the impact of one element on others, has direct and indirect links with the external environment and is based on such principles as flexibility, adaptability, compatibility and interconnection of all its parts
M. Horodko	a complex organizationally complete economic system with feedback, consisting of interconnected elements that have internal and external links, the ability to change their structure and determine behaviors in accordance with new goals under the influence of the external environment
I. Vinichenko M. Horodko	a set of interdependent and interacting participants in the economic processes of formation and movement of flows, united by the unity of the target vector, having the ability to quickly select the most efficient service at a minimum total cost
N. Hryniuk D. Spiridonov	a complex, organizational complete (structural) economic system consisting of elements (links) interconnected in a single process of resource flow management
V. Shynkarenko	a management system designed to optimize the processes of formation and movement of material resources, work in progress and finished products from supplier to the final consumer in the right range, in the right place and at the right time with a minimum of resource costs
D. Chechel	the set of subsystems between which there are relationships and which perform certain functions; its functional subsystems are: supply, production, transportation, sales, warehousing

Source: compiled on the basis of generalizations of scientific references.

Researchers L. Zaburanna and A. Kulik emphasize that scientists consider the logistics system according to three typical definitions:

1) as a set of processes and phenomena, as well as the links between them, which exists objectively, regardless of the subject of management. Here the logistics system acts as an object of study and an object of management;

2) as an institute, a method of research. In this interpretation, the logistics system is identified with the concept of a model;

3) as a compromise between the first two groups. The logistics system is an artificially created set of elements (e.g., teams, technical means, scientific theories),

designed to solve a complex economic problem. The logistics system is a real object and at the same time an abstract reflection of the connections of reality.

According to V. Shynkarenko, the given interpretations, depending on the content and attitude to management, can be conditionally systematized into the following groups:

definitions that unambiguously associate the logistics system only with the material flow;

formulations in which the logistics system is perceived as a set of elements (subsystems). At the same time, the content of the elements is not determined, but only their functional connection and focus on ensuring the formation and movement of the material flow of the required amount of nomenclature, at the right time and place with minimal resource costs;

definitions in which there is no explicit mention of management, but it is about the elements associated with the material flow;

definitions that associate the logistics system in part with management, namely as: material flow management system; organizational and economic (economic) mechanism for managing material and information flows.

Based on the generalization of theoretical approaches to the economic essence of the category “logistics system”, we note that this definition is mostly defined as: 1) an adaptive system with feedback; 2) a component of the economic system; 3) specially organized integration of logistics elements; 4) an ordered set of elements; 5) the integrity of functionally related elements (subsystems); 6) a set of infrastructure facilities; 7) component of the organizationally complete economic system; 8) material flow management system; 9) complex multilevel system; 10) a set of logistics subsystems; 11) part of the market mechanism of expanded reproduction; 12) organizational and economic mechanism for managing material and information flows; 13) organizational and managerial coordination mechanism; 14) a set of integrated logistics processes; 15) specially organized and integrated flows of materials and products; 16) relatively stable set of links.

Analysis of the definitions of "logistics system" shows that among scientists there is no uniformity in the meaning of this term. The given interpretations, depending on the content and attitude to management, can be conditionally systematized into the following groups: process; institute; model; ecosystem component; mechanism; set of links; integration of subsystems; orderly structure.

The characteristic properties of logistics systems include: complexity, structure, availability of connections, hierarchy, emergence, complexity, integrity, synergy (manifestation of synergistic effect), the presence and priority of material transformation processes flow, flexibility, dynamism, and stability, adaptability, focus on integrated efficiency.

Today there is a broad classification of logistics systems (*Table 2*) [85-90] on a number of grounds, among which are the following: the scale of distribution; by type of logistics flow; depending on the type of chains; the nature of management; by the degree of automation, etc.

As a result of research [91-95] it was found that the concept of a logistics system should be considered from the standpoint of changing the paradigm of logistics management; transformational transformations in the global world, namely in view of the rapid development and spread of network, digital, green and circular economy in the context of sustainable development.

It should be emphasized that the intensification of transformation processes will contribute to the qualitative transformation of logistics systems of various scales (change of type, shape, characteristics, and structure), which, in turn, allows the transition to a fundamentally new level of functioning and development.

Table 2 – Classification of logistics systems

Classification feature	Types of logistics systems
1	2
On the scale of the action	Micrologistic, macrologistic, global, metalogistic, mesologistic
On a territorial basis	Urban, district, regional, regional, interregional, national, transnational, *cross-border*, local**
On the basis of object-functional features	Departmental, interdepartmental, branch, interbranch
By the nature of the connections in the system	With direct connections, echeloned, flexible

The end of the Table 2

1	2
Depending on the material flow management mechanism	Pulling, pushing, reversible
In the direction of movement of material flow	Straight, reverse
By number of elements and connections	Simple, complex
According to the level of independence	Autonomous, relative
By way of organization	Subordinated, coordinated
By type of economic flow	Material, financial, labour, information, innovation, resource
By operating environment	Real (physical), virtual (cybernetic), integrated (physical, provided by cybernetic tools)
According to the mathematical method of management	Continuous (set by continuous parameters); discrete; hybrid (mixed)
On a functional basis	Production, transport, trade

Notes: *supplemented by the author.
Source: compiled on the basis of generalization [85-90].

Thus, when clarifying the essence of the term "logistics system" it is necessary to apply an integrated approach (integration of system, process, functional, situational) and take into account current challenges (globalization, digitalization, clustering, greening of logistics, customer focus, sustainable development) and transformational change in the global, national and regional economy.

In this paper it is proposed to consider the logistics system from three positions, namely:

1) a set of interconnected and interdependent elements (units, objects of logistics infrastructure, information systems, digital technologies); resources (production, labour, information, financial); different groups of stakeholders (participants in logistics flows and services) who are united by common goals and have common economic interests; institutes designed to provide an organizational and economic mechanism for the smooth flow of logistics flows in a changing institutional environment in the spatio-temporal dimension, reducing costs for the organization of logistics activities and achieving sustainable development;

2) a relatively stable set of structural units (functional units of companies, intermediary organizations, consumers, different categories of stakeholders),

interdependent and integrated into a single process of logistics management to achieve strategic goals of logistics services and ensure sustainable development;

3) interconnected set of objects and subjects of management through the implementation of the entire list of functions of the management of logistics processes in a single complex based on the use of mechanisms of institutional, organizational, investment, financial and economic, environmental, information support.

In further research, it is planned to perform a comparative analysis of the essence of the concepts of “development of the logistics system” and “transformation of the logistics system”; to offer a comprehensive approach to determining the content of the category “strategic management of the logistics system” taking into account current global challenges.