

ORGANIZATION OF THE FUNCTIONING OF LOGISTICS SYSTEMS ON THE BASIS OF MODERN TECHNOLOGIES

ОРГАНІЗАЦІЯ ФУНКЦІОНУВАННЯ ЛОГІСТИЧНИХ СИСТЕМ НА ОСНОВІ СУЧАСНИХ ТЕХНОЛОГІЙ

The article deals with theoretical and methodological foundations of the system organization of the functioning of logistics systems based on modern technologies. The results of the research presented in the work allow us to substantiate scientifically measures to develop domestic logistics systems of companies to the level of 3PL and 4PL, 5PL – service providers; model management options for a company operating as part of a logistics chain; optimize the structure of the enterprise based on the goals and tasks in the field of logistics; to study the possibilities of introducing information technologies of fixing the company to the level of 3PL, 4PL, 5PL – service providers.

Key words: logistics, logistics system, modern technology, logistics supply chain, information technology, service providers, logistics provider.

У статті розглянуто теоретичні та методологічні аспекти організації системи функціонування логістичних систем на основі сучасних технологій. Результати досліджень, представлені в роботі, дають нам змогу науково обґрунтувати заходи щодо розвитку внутрішніх логістичних систем компанії до рівнів 3PL і 4PL, 5PL – постачальників послуг; варіанти управління моделлю для компанії, що діє як частина логістичного ланцюга; оптимізувати структуру підприємства на основі цілей і завдань у галузі

логістики; вивчити можливості впровадження інформаційних технологій для фіксації компанії до рівнів 3PL, 4PL, 5PL – постачальників послуг.

Ключові слова: логістика, логістична система, сучасні технології, логістичний ланцюжок поставок, інформаційні технології, постачальники послуг, логістичний провайдер.

В статье рассмотрены теоретические и методологические аспекты организации системы функционирования логистических систем на основе современных технологий. Результаты исследований, представленные в работе, позволяют нам научно обосновать меры по развитию внутренних логистических систем компаний до уровней 3PL и 4PL, 5PL – поставщиков услуг; варианты управления моделью для компании, действующей как часть логистической цепочки; оптимизировать структуру предприятия на основе целей и задач в области логистики; изучить возможности внедрения информационных технологий для фиксации компании до уровней 3PL, 4PL, 5PL – поставщиков услуг.

Ключевые слова: логистика, логистическая система, современные технологии, логистическая цепочка поставок, информационные технологии, поставщики услуг, логистический провайдер.

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Formulation of the problem. Development of the conception of logistics outsourcing is driven by the trends of the economic globalization. Separate organizations become mainstreamed into the worldwide production network. The processes of supply and marketing become more complicated, too, and the level of logistics knowledge turns into the key factor of success for all the value chain partners. Consumers' increasing demand induces companies to apply such an instrument as outsourcing in their business activities [1, p. 320].

The outsourcing of logistics functions lies in a transfer of any logistics functions (supply, production, sales) that may be fully or partially separate, and/or of any complex logistical business processes to an external outsourcer company.

All in all, it can be deduced that presently the definitions used in the field of outsourcing (in particular, the outsourcing of logistics functions), as well as the forms of interaction between any members of an outsourcing project have not been definitely established or accepted because partnering relationship within the framework of any particular outsourcing agreements can differ to a considerable extent.

This is due to the rapid pace of development of this sector of business and the up rise of some new forms

of relationship under the conditions of economic globalization and the legal restrictions imposed by some countries, etc.

Analysis of recent research and publications. Today, it is possible to identify the main points of contact to form an integrated approach to outsourcing logistics functions as a system for reconciling business processes. Outstanding specialists in the management of logistic processes consider logistic outsourcing as a system aimed at improving the efficiency of the system, implemented on the basis of a system approach (B.A. Anikin (2009), V.S. Lukinskiy (2005), V.I. Sergeev (2001), M.Y. Postan (2015)). In the deepest sense, outsourcing is equal to the resource using, which includes the purchase of all types of activities, including those that are at the base for good [2, p. 20–30].

The external environment means the creation of value outside the company, and strategic attention to external resources [3, p. 23–29].

Outsourcing has evolved into a more strategic process; cooperation, cooperation and the development of the code should be successful [4, p. 1071–1080].

Outsourcing requires close and long-term relationships to maintain a competitive advantage [5, p. 15–25] and should not be used as a synonym for contracting. A contract means work performed by

an external supplier on a unified basis [6, p. 142–155], whereas outsourcing involves the use of external skills and capabilities of an external supplier [7, p. 670–728].

Madhok acknowledged that firms should consider their own attributes of capabilities and their competencies prior to logistic outsourcing [8, p. 535–550]. There are many articles on logistic outsourcing for example [9, p. 24–34], in most cases without taking into account the methodology. According the key strategic issue of competitiveness understands why one firm is different from the performance of another.

Based on the resource, he argues that a competitive advantage arises when (1) competitors cannot take advantage of this strategy, and (2) it continues to exist after efforts to duplicate this advantage have failed. Accordingly, the decision as to whether the process should be logistic outsourced should be based on an actual assessment of one's own ability in comparison with competitors and suppliers. Therefore, argues that the analysis concerns the definition of the differences between the organization and the potential suppliers of external processes.

One of the key issues here is the ability of suppliers who provide basic services – whether they can surpass life processes compared to the organization itself or its competitors [10, p. 135–143].

However, it is not always easy to determine which services are cores or non-core [11, p. 57–70]. As a second measure, states that in the logistic outsourcing process, it is necessary to determine the contribution to the competitive advantage of the activity.

Statement of the main material of the study.

The introduction of the term “outsourcing” in management theory is associated with the use of resources of external organizations or providers in the field of information technology. Many specialists assume that outsourcing has spread in connection with the development of information systems and technologies, and refer to the beginning of the “epoch of outsourcing” to the 60-s. XX century, namely by 1962, the date

of foundation of the Electronic Data System Corporation (EDS). In Germany in 1960–1980, the practice of creating centers for electronic information processing at large enterprises began to be developed, which subsequently began to provide appropriate services to medium and small firms that do not have the necessary technical capabilities.

A Logistic Service Providers is a specialized commercial organization carrying out some particular operations or complex logistics functions (warehousing, transportation, order management, physical distribution, etc.), as well as effecting an integrated supply chain management for its corporate customers.

A classification of logistic service providers including insourcing may be represented as follows: 1PL – First Party Logistics – refers to an autonomous logistics when an organization performs a whole complex of logistical operations on its own; 2PL – Second Party Logistics – presupposes contraction of services of any monocline logistic service providers (such as carriers, forwarders, customs brokers, insurance companies, warehouses, and cargo terminals that perform separate logistics functions); 3PL – Third Party Logistics – means that all the logistics functions are outsourced to a logistic service provider that gives an all-around logistics support; 4PL – Fourth Party Logistics – Is a logistic service provider performing a supply chain management (SCM) for a corporate customer; 5PL – Fifth Party Logistics – means a “virtual logistic service provider” that assumes the functions of a 4PL applying at large the internet and any know-how as a single virtual platform ensuring a more profound and comprehensive interaction and coordination of work with the customers serviced.

Considering the quality of services and the range of logistics offer suppliers, it is possible to allocate the following consecutive levels of development of outsourcing of logistic functions for the organization-customer. The main reason for the development of the tendencies of cooperation in the supply chain in the

Table 1

Characteristics of the services of logistics providers

Types of logistics service providers	Basic services	Examples of companies
“Transportation Provider” (transportation providers owning real assets)	Logistics “accommodation” (dedicated logistics). Transportation, centralized transportation, maintenance, routing.	Schneider, Ryder, Hunt, Danzas, TNT, UPS, FedEx, Airborne, DHL.
“Transportation Provider” (providers of optimization of transport services that do not have real assets)	Integrated logistics. Service-oriented logistics. Focused on technology, reengineering.	CH Robinson, Mark VII, Ryder, UPS Worldwide, Menlo, FedEx.
Vendors of value-added warehousing	Integrated logistics and logistics of “placement”. Technologies of warehousing and transportation.	Caliber, DSC, Tibbett & Britten, GATX, Exel Logistics, Fiege Group, Menlo.
International forwarders, carrying out outsourcing of logistics functions (not having real assets)	Integrated logistics with international forwarding capabilities.	AEI, Circle, MSAS, Kintetsu.
“IT Providers”	Packages of logistics programs.	Manugistics, 12/ Intertrans, McHugh, Logility, Extricity, Manhattan.

Source: built by the author according to the data [12]

Development of logistics services outsourcing services

Level	1 level	2 level	3 level
The number of logistics functions transferred to the provider	The only function	Several functions	Complex interconnected functions
Sales markets	Local, regional	Interregional	Global delivery "from door to door"
The nature of the relationship	The contract for the year	Long-term relationship (contract for 3 – 5 years)	Strategic partnership, major contracts
The value of the contract	Reduction of costs due to partial reorganization and business process reengineering (BPR)	Cost reduction, revenue growth in the expansion of sales markets	Optimization of business processes (in accordance with the ISO 9000 standard)
Provider competence	A lot of assets. Performing individual operations	A shift from ownership of assets to ownership of information	Focus on information management; integration based on IT solutions
Competitiveness	Insensitivity to coping	The cooperation of logistics intermediaries, the formation of strategic alliances	Many large alliances on the market

Source: built by the author according to the data [12]

field of logistics is the clearly increased requirements of customers, which in turn are caused by the growth of logistics costs and the need to concentrate on managing a high level of logistics costs.

In practice, the term "1PL" ("first party logistics") refers to any companies that specialize in some separate lines of activity in the field of logistics business. They focus on providing services in carrying out some separate operations upon delivery of cargo: transportation, storage, customs clearance, etc. As a rule, this segment of the logistics business is occupied by carriers, customs brokers, port authorities, stevedoring companies, trans loading companies, etc. Freight owners (both consignors and consignees) may enter into any contracts with any first party logistic company, whether directly or through any intermediaries which are usually determined in practical terms as 2PL-level providers representing the subsequent level of logistic services. Among companies providing services at the 2PL level are any forwarding, or freight forwarding companies that perform the role of intermediaries between buyers (freight owners) and sellers (1PL providers) of such services.

As opposed to the 1PL-type companies, the 2PL model implies providing complex services in several lines all at once. Thus, it can be illustrated with a situation when cargo is carried by several kinds of transport within a transportation system, customs clearance services being provided, as well. It should be mentioned that today such a business paradigm applied by the domestic forwarding companies is one of the most desirable.

Transition to a level of higher quality has resulted in origination of the term "a third party logistics", or "3PL", which refers to any outsourcer companies that sell an integrated service in delivery of cargo on the door-to-door principle accomplishing also all the operations required. Nevertheless, their functions exclude any

management of freight traffic: in this case all issues will be assumed by a buyer, i.e. a consignor or consignee.

Depending on functions performed, all 3PL models are classified as standard (a standard service) ensuring performance of such functions as packaging, storage, and delivery of cargos; service developer (an advanced service), which provides additional services in tracking cargos and trans loading in case of an intermodal transportation; customer adapter (a service adapted to a consumer's needs), which provides complex services, mainly to small-business customers, in an efficient building of a logistic system, but does not develop any new kinds of services; customer developer (an advanced service adapted to a consumer's needs) encompassing not only an external, but also internal logistics for a customer [12].

A 3PL model implies a whole complex of logistics services, from delivery and cell-based storage to order management and goods tracking. A 3PL provider's functions include organization and management of cargo shipping, stock record and management, preparation of import and export documents, warehouse storage, cargo handling, and delivery of an ultimate consumer.

The task of management of many companies as a single system in logistics should be understood, first of all, as a service for supply chain partners. In theory, there is a settled notion "a fourth-level logistic service provider", similarly to and as extension of the notion "a third-level logistic service provider". When a customer deals with a logistic service provider of this type, the former may rely on a comprehensive service and assistance with an adaptation to the ever-changing conditions of the external situation, which is an additional factor for an enhancement of such a logistic service provider's competitiveness. However, a provider of the 3PL generation does not solve any problems related to freight traffic: this function is still performed by a freight owner.

Therefore, appearance of a 4PL provider on the market of logistics services can be qualified as expected and foreseeable. The term “4PL” was registered for the first time by a consulting company styled Andersen Consulting, now renamed Accenture, in 1996, as having the meaning as follows: “A fourth-level logistic service provider is a supply chain manager that brings together its own resources, capabilities, and technology with the resources, capabilities, and technology of another logistics service provider and manages the same in order to offer a solution of tasks in a supply chain to its customers to the fullest possible extent” [13, p. 479].

It is important that all the 4PL providers, or fourth-level providers, be by all means involved in a manufacturing process. As a rule, a 4PL provider is a major logistics service provider having a large infrastructure and advanced supply chain management systems and accomplishing high-technology processes and complicated logistic schemes. In order to achieve the level of a 4PL provider, there are possible ways as follows: a third-level logistic service provider may develop until the level of a 4PL one. A manufacturer of an ultimate product may organize a business on the principle of a 4PL model for solution of any similar tasks. A consulting company may assume the role of a 4PL provider. A company engaged in providing services in the field of IT may become a 4PL provider. A supply chain partner may become a 4PL provider. The evolution of a third-level logistic service provider seems the most appropriate. Given the business contacts with customers established by a company, it will be the most likely. Parallel to planning of their own routes, these companies shall fulfil such tasks as planning of coordination of transport, warehouse and stock management for their customers, as well as shall render any other services implying emergence of a value added. Nevertheless, there may arise some problems with customers, who can misunderstand the new role of such a company: on the one part, a consignor may be doubtful of impartiality of a logistic company; on the other part, today the information technology structure of many potential 3PL logistic providers only reflects the needs of a logistic company itself, but does not allow effecting the overall management, even if there are appropriate interfaces, that may function perfectly well, for exchange of data with customers and subcontractors.

In reality, it is already difficult for enterprises to organize optimal servicing and providing customers with supplies without attracting partners in the field of logistics in conditions of pressure from competitors. Therefore, the development of providers becomes important. 5PL – is a new level of logistics outsourcing, which arose in the investigation. The latest developments in the field of combining intelligent software maintenance of different levels and localization, in conjunction with the development of strategic partnerships

among all participants of logistics chains. In the modern educational and scientific-methodical literature, many authors distinguish. 5PL logistics providers (Fifth Party Logistics) as a separate element in the classification of logistics operators [14, p. 14–17]. Under the 5PL, a provider is generally understood to be a logistics operator whose activities are based on the use of a complex of modern information and communication technologies that allow the database of consignors, consignees and transport companies to be interactively operated, plan transportation, dispatch and monitor the execution of orders in a virtual logistics system [15, p. 244–246]. Many authors, and in particular A.V. Ivashchenko and D.G. Peysahovich, is understood by the operator's 5PL provider, which basically manages the flow of information about orders, resources, plans and the actual state of the transport network in the integrated supply chain [16, p. 153–158]. If we consider 5PL providers from the point of view of the integration approach, as do K.O. Loshnev, E.P. Taraskina, D.I. Zarudnev, A.H. Dikinov, L.V. Honchukaeva and E.R. Aitbagin, then under 5PL-provider it is necessary to understand management of all components of the integrated supply chain, and not only information flows. Such management is understood within the framework of a single information space, using the Internet as a unifying virtual platform. Such a system is also called “virtual logistics” or “Internet logistics” [17, p. 49–52]. In this case, the 5PL provider is already defined as a service company that performs integrated services for managing integrated processes in supply chains on the basis of outsourcing without the use of physical mechanisms for managing material and other logistical flows.

According to E.R. Aitbagina the 5PL provider is a logistic operator that takes over the functions of the 4PL operator and provides deeper and more comprehensive interaction and coordination of the clients' services in real time with extensive use of the Internet. However, this interpretation of the 5PL provider also does not make it possible to separate it as a separate, independent element of the classification of logistic operators. This seems impossible in view of the fact that according to the experience of practitioners themselves, 3PL – and 4PL –providers themselves several years ago already switched to maximizing the full informatization and virtualization of their activity and without giving up their material and technical base, but, on the contrary, strengthening it and automating it. Virtualization, informatization and automation of 3PL and 4PL providers has become a routine and necessary practice of the modern market today and does not cause a significant expansion or radical change in the range of logistics services providers, goals and processes of their services, therefore, does not change their species, process or functional composition and does not allow to allocate such kind of “virtual” or “Internet providers” as a new type of logistic operators.

However, e-commerce is not a new segment or a new criterion for classifying supply chain management solutions. It leads only to the formation of a wider range of offers of integrated services 3PL and 4PL level in supply chains. The emergence of this concept is primarily due to the fact that the rapid development of modern information systems and technologies makes it possible to introduce the most powerful and progressive technologies into the sphere of economy, business and logistics service, providing an unprecedented, previously impossible level and scale of data processing that forms the basis To make decisions not only operational level, but also strategic.

These technologies include not only embedded in the field of logistics outsourcing Internet technologies and electronic document management technologies. Changes in strategic logistics planning are primarily related to the introduction of intelligent systems based on neuro-cybernetic data analysis technologies, as well as expert technologies of automated machine management decision-making and impact on subordinate objects.

Technologies of distributed computing will allow processing practically unlimited volumes of information and, consequently, serve logistic chains and logistic networks of any scale, national, international, and planetary. This will allow us to cover and integrate logistics networks and supply chains in each country, economic or geographical alliance, as well as on different continents, in the future creating and servicing a single global economic-distributive network of commodity economy. In turn, artificial intelligence technologies will automate the decision-making process in logistics networks of this scale, replacing in this issue the intellectual abilities of a person who in this case will not be physically able to cope with the scale of such activities.

Modern reality can be absolute impartiality and maximum optimality from the point of view of the effectiveness of the functioning of the entire logistics network, the life activity of states and economic unions. The society will be able to approach the optimal food and commodity supply of the national economy and consumer, environmental and energy security and economy. The use of artificial intelligence technologies will solve the problems and eliminate the bottlenecks associated with the issues of inter organizational logistics coordination in supply chain chains and networks arising from the opposite of the interests of the network participants, and will also allow not only the most effective operational accounting, control and planning of the logistics networks, but also to carry out tactical and strategic management of logistics networks based on self-learning expert systems.

The 5PL provider begins to determine the policy of development of the global logistics service, and, consequently, the policy of economic development. With the use of these technologies, the 5PL provider

has the opportunity to set the system of co-ordinates of activities for the participants of logistics chains and supply networks, act as an integrating factor, and find a very mobile and constantly changing balance between the multidirectional interests of states, consumers and commercial participants of logistics networks of food and industrial goods. And, it can be concluded that in this context it is the conceptual changes in the goals, tasks, functions and scope of activity, as well as the place, role and purpose of the logistics provider in the supply chains that allow us to talk about a really new step and a new level in the classification of logistics operators.

It is the enumerated possibilities of independent determination of the strategy for the development of logistics chains and supply chains based on a given, chosen political concept and automated compulsion of the participants in the supply chain to execute it, are the basis for distinguishing the 5PL provider as an independent, truly conceptually new and fundamentally different from all previous logistics operators, the provider of the highest level in the classification of operators of logistics outsourcing.

A logistic intermediary represents an essential element in a logistic service provider company because the cooperation with the former allows a company to get any competitive advantage for account of: a reduction in operational logistics costs, overall increase in efficiency of the functioning of a logistics system and, as a consequence, reduction in prime cost of goods; enhancement of flexibility and adaptation of a company to the ever-changing environment; mitigation in logistics risks; reduction in duration of the operational and logistics cycles.

Whereas previously the field of logistics represented, at the most, the classical kinds of logistical services, such as stockpiling, transportation, and cargo handling which take shape as a particular physical operation, now the logistic activities are deemed to include any coherent business processes having a coordinating and strategic nature.

All logistic service providers are divided into classes reasoning from the nature of their activities; it may be operating, coordinating or strategic: monoline logistic intermediaries (transportation companies, forwarding agents, jointly occupied depots, cargo terminals, customs brokers, agents, stevedoring companies, insurance companies, providers of any information and consulting services in the field of logistics); 3PL providers, which embrace any firms rendering a coherent logistics service for a customer (being a manufacturing company, commercial partnership or a service provider); 4PL providers representing any systems logistics integrators.

Monoline logistics intermediaries focus on the operating activities. 3PL providers carry on the operating and partially coordinating activities (which mean integration and coordination of the operating functions

in a single provider). 4PL providers tackle the coordination and strategic activities (which presupposes a systematic approach to the management of any core logistics business processes, integration and coordination of actions undertaken by a target company and key contracting parties in a supply chain).

Turning to the experience of the Western market, it is possible to note the key problems arising in the interaction with providers or is constraining factors for such interaction. The first is the unrealized conditions fixed in the SLA, and the absence of the expected cost optimization (Tables 3, 4).

Firms owning real assets own or acquire leasing vehicles, warehouses. Firms that use outsourcing services enter into agreements with other firms that provide all or part of the services in the field of physical distribution. Firms providing information services are a type of companies without physical assets that act as intermediaries in optimizing the logistics systems of enterprises and interact with other asset-owning firms on a contract basis. Creation of

a common information space as an environment for an integrated planning and management of any supply chain interactions and as a tool for perfection of a supply chain management system is fundamental for expansion of the outsourcing of logistics functions. The crucial factor determining the prospects and opportunities a company has in order to develop its models of integrated planning and management of its supply chains on the basis of the outsourcing of logistics functions is the state of the information technologies.

The main objective of managing logistic communications is to provide a favorable attitude to the manufacturer of goods by creating a common motivational field of exchange participants which is focused on the rational use of available resources and harmonization the interests of the parties. The modern concept of logistic communications is the concept of integrated logistic communications, actively explored and developed today by the researchers of the problems of interaction of subjects in the logistic.

Table 3

Problems faced by companies, referring to the provider, %

№	Problems with Providers	Europe	America	Asia
	Unrealized agreements and services agreements	46	43	46
1.	The shortage of long-term, constant improvements and achievements in the proposals	41	37	41
2.	Cost reductions have not been achieved	37	37	34
3.	Unsatisfactory IT services capabilities	31	38	38
4.	Lack of experience in project management	35	31	36
5.	Unsatisfactory transition period in the process of implementation	28	34	33
6.	Ineffective management of key performance indicators	27	28	31
7.	Too many problems related to the human factor	28	30	32
8.	Lack of consulting, intellectual skills	23	22	34
9.	Impossibility of providing services on a global scale	19	16	20
10.	Insufficient integration of business processes across regions and across the supply chain	18	21	28
11.	Inability to build a purposeful and reliable relationship	13	15	19
12.	Weak information integration with the acquired companies	13	12	21
13.	Lack of problems	16	17	5

Source: the table was compiled by the author on the material [1; 18]

Table 4

Reasons why companies do not address the services operators, %

№	Reasons	Europe	America	Asia
1.	Logistics is a key activity of our company	28	34	26
2.	Abbreviations costs are not expected	44	39	36
3.	Level of service agreements will not be implemented	28	34	32
4.	Logistics is too important to outsource	30	30	24
5.	Decrease in control over outsourced functions	23	32	8
6.	Better practice than most 3PL operators	26	23	12
7.	Corporate ideology excludes access to 3PL operators	16	11	20
8.	Need to improve the capabilities of 3PL operators globally	23	16	8
9.	Security-related issues transportation and shipment of goods	7	18	20
10.	The inability of 3PL providers to build a focused and trusting relationship	14	14	8

Source: the table was compiled by the author on the material [1; 18]

Methodological weakness of the concept of integrated logistic communications is that it implies the implementation of integration only on instrumentality level, regardless of the set of participants in the interaction and their characteristics (motivation, resource, organizational, technical, innovation, etc.). Depending on our opinion, integration should have a response in the form of conjugation motives of participants, their resources, actions logistician in satisfaction the needs of consumers differ in their behavior under various conditions of logistic conditions and the particular communication area. The concept of integrated logistic communications, which provides large-scale use of low-budget tools longlisting communications, should be transformed into the concept of the integrated logistician communications [18, p. 46–50]. The last implies the creation and development conducive for the initiator communicative environment providing modification of consumer perceptions and behavior of target groups and to achieve the strategic goals of the enterprise. The main objective of managing logistician communications is to provide a favorable attitude to the manufacturer of goods by creating a common motivational field of exchange participants which is focused on the rational use of available resources and harmonization the interests of the parties.

Conclusions from the study. Logistic outsourcing is a consequence of the evolution of a modern enterprise. The change in general methodological approaches to the organization of the production process, systems and management process is associated with such factors as greeting an internal competitive environment; transition from functional to technological specialization; reengineering of production processes; changing the system of internal and external communications; intensification of information exchange; striving to reduce costs. The methodology of logistics outsourcing develops and is reflected in all modern types of organizational structures.

The structure of the process of logistics outsourcing presupposes a strategic and economic justification for the need to delegate authority for certain processes and activities. The choice of the provider of logistics outsourcing services is carried out as a result of the analysis of the available services market.

Modeling the process of logistics outsourcing requires the formalization of socio-economic factors that influence the decision on logistics outsourcing. Modeling the process of logistics outsourcing allows formulating a general methodical approach to making managerial decisions about the use of certain types of outsourcing.

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ORGANIZATION OF THE FUNCTIONING OF LOGISTICS SYSTEMS ON THE BASIS OF MODERN TECHNOLOGIES

The results of the research presented in the work allow us to substantiate scientifically: measures to develop domestic logistics systems of companies to the level of 3PL and 4PL, 5PL – service providers; model management options for a company operating as a part of a logistics chain; optimize the structure of the enterprise based on the goals and tasks in the field of logistics; to study the possibilities of introducing information technologies of fixing the company to the level of 3PL, 4PL, 5PL – service providers.

For this purpose, the paper studies the theoretical foundations of the management of logistics systems by companies, based on the outsourcing of logistics and information technology level 3PL and 4PL, 5PL service providers. The subject of the study is the organization of the logistics systems of companies in the conditions of economic globalization. The following research methods were used in the work: structural analysis, synthesis, comparison, economic and mathematical methods, research method related to target and synergetic principles, scientific methods and methodological apparatus of logistics management, the theory of material flow management of the methodology of economic efficiency evaluation of management and logistics technologies. The research was based on data obtained from the following sources of information: scientific publications and monographic publications of domestic and foreign scientists, materials of scientific conferences and studies, materials of periodicals, reports and analytical materials from official websites.

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