

## СУЧАСНІ ТЕНДЕНЦІЇ ТА ПЕРСПЕКТИВИ РОЗВИТКУ КОНЦЕПЦІЙ ЛОГІСТИКИ

© Питуляк Н.С., 2014

Узагальнено та проаналізовано основні концепції логістики. Визначено її сучасні тенденції та перспективи розвитку. Виокремлено перспективні напрями розвитку логістики, серед яких екологістика, “зелена” логістика, реверсивна логістика, геологістика. Здійснено порівняльний аналіз сутності понять “екологістика” та “зелена” логістика. Досліджено базові положення концепції екологістики. Доведена необхідність та актуальність розвитку екологістики в сучасних умовах, визначено роль екологістики в діяльності підприємства. Запропоновано основні завдання та принципи екологістики.

**Ключові слова:** концепції логістики, екологістика, “зелена” логістика, завдання екологістики, принципи екологістики.

## MODERN TRENDS AND PROSPECTS FOR LOGISTICS CONCEPTS DEVELOPMENT

© Pytulyak N.S., 2014

Main concepts of logistics have been generalized and analyzed. Modern trends and prospects for logistics development have been defined. The perspective directions of logistics development have been distinguished, including ecologistics, “green” logistics, reverse logistics, geologistics. The concepts of ecologistics and “green” logistics have been comparatively analyzed. Main principles of logistics concepts have been researched. The necessity and relevancy of the development of ecologistics in contemporary conditions have been proved and the role of ecologistics in enterprise performance has been defined. Main aims and principles of ecologistics have been suggested.

**Key words:** logistics concepts, ecologistics, “green” logistics, aims of logistics, principles of ecologistics.

**Problem formulation.** In the context of globalization and increase in demand for quality of goods and services, national enterprises are more actively searching for the ways and new ideas that would help them to decrease general costs and optimize processes of an enterprise. Taking into account that nowadays Ukrainian economy is going through the stages of market relations deepening, enterprises are working in the conditions of crisis, competition as well as volume of production and consumption is increasing, there is great necessity in application of new concepts of management of economic processes at enterprises and beyond them. Logistics as a science of planning, management and control of flows in systems plays a significant role in progressive changes of national economy, and its modern concepts will help to

effectively organize economic activity of enterprises with the lowest costs. Wide use of logistics concepts by national enterprises will gradually lead to understanding of the necessity of system approach to the management of economic processes, moreover new economic potential and possibilities for further development of overall economy will appear. Real understanding of positive changes and competitive benefits, arising as a result of application of logistics concepts, gives possibility to estimate the significance of logistical approach to enterprise management and actualizes researches of modern trends and prospects for logistics development.

**Analysis of current research outputs and publications.** In specialized literature on logistics great amount of attention is paid to the development of logistics as a science. Logistics flows, logistics systems and elements of logistics systems are researched and analyzed. Works of foreign scientists, such as B. Anikin, D. Bowersox, P. Drucker. K. Kloze, J. Landleu, L. Mirotin, H. Pfol highlight main concepts of logistics, suggestions about finding solution to some problems and main principles of development of fundamental theoretical basis of logistics [3, 10, 11]. Among Ukrainian scientists an important contribution in logistics development was made by Ye. Krykavskyy, V. Nykolaychuk, M. Oklander. I. Smirnov, N. Chukhray [2, 4, 5, 6]. Works [6–12] highlight issues of new directions of logistics development and analyze new logistics concepts, mainly concepts of ecologistics and “green” logistics. Along with that, the study of economic literature has revealed that despite of great amount of theoretical and practical works in the field of logistics, a set of issues have not been fully researched as yet. For instance, modern trends of logistics, prospects for logistics development, main directions of improving of existing logistics concepts and preconditions for appearance of new ones.

**Article objectives.** The aim of the article is to generalize and analyze the main concepts of logistics, research modern trends of logistics development and explain the directions of improving and defining of the prospects for existing logistics concepts development.

**Presentation of main materials.** In their work organization world enterprises are widely using logistics concepts, success of which was proved long ago. As a rule, the most popular is the use of element-by-element logistics with the help of which they organize separate internal manufacturing, marketing, supplying, warehousing, transporting processes according to the principles of logistics. Not so often logistics is used in complex and system approaches to enterprise management as a whole system. Research of German, Dutch, British, French, Belgian, Hispanic enterprises of various branches revealed that irregular daily logistical planning is used by 57 % of companies [4, p. 68], the use of logistics elements for seven days period in order to reduce production costs is used by 20 % of the researched companies, introduction of integrated system connected with raw materials, materials, supply of ready-made products to consumers is used by 23 % companies. The enterprises that started using logistics technologies increased productivity of their employees approximately by 10 %. With every year these figures are improving.

Logistics is not a new science. According to literary sources, it was initially applied in warfare during Byzantine era. At that time logistics was understood as a battle strategy and tactics, provision of material needs to army and its commandment [3, 4, 5, p. 5]. Logistics is also mentioned in the documents of French Royal Army, in the works of Leibnitz, a German philosopher and mathematician as well as historian Jomini, whose works were later published in the USA [5, p. 26]. Later logistics was applied to entrepreneurship, since every business activity may be equaled to warfare. More and more people began to turn to this science in order to gain their point on the market and increase appropriate level of competitiveness as well as earn leadership. As a separate science, modern logistics formed in the 1970s.

With every stage of logistics development logistics concepts are developing as well. Each stage of logistics development marks the change of the system of thoughts and explanations of theoretical approaches, directed at total cost finding solution to the problem of business activity organization. World and Ukrainian scientists in their works prove and research main logistics concepts. Mainly, M. Oklander distinguishes five fundamental logistic concepts [5], Ye. Krykavskyy, besides widely-known concepts, describes the concept based on the decentralization of tasks [2, p. 16]. I. Smirnov gives reasons for the

main principles of geologistics and explains the concept of backward logistics [6] which is also known as “reverse logistics” [7, p. 383]. L. Mirotin characterizes three concepts of logistics: concept of system approach, concept of general costs and concept of service logistics [3]. In order to better understand the nature of logistics concepts, logical consequence of their development and their influence on entrepreneurship, let us analyze and generalize the most important logistics concepts.

General costs concept lies in the fact that in the event of complex analysis of all costs, one can conclude that their increase or decrease in a separate link may considerably decrease general costs. For instance, by using air transportation shipping costs are increasing, but warehousing, loading, transloading costs are decreasing. In this case it should be determined whether or not shipping costs eliminate other expenses (such as on warehousing, loading, transloading, delivery time). If such phenomenon is observed, then general costs are reducing as well. Using the concept of general costs, it is necessary to group and regroup expenses in such a way that would decrease level of costs. Such concept is the basis for assessment of the efficiency of logistical decisions [3, 5, p. 33].

System approach concept is based on in-depth analysis of all systems (subsystems) of an enterprise. In-depth analysis will allow finding out inconsistencies between some processes at the enterprise or constituents where such effect is violated [5, p. 33]. For instance, by monitoring possible delays in production that occur due to bad supply system, equipment reorganization. One should take into consideration that supply problems will lead to production delays that will lead to delays on the next stages of enterprise activity. It will cause disorganization in the activity of enterprise divisions. Overloading of warehouse industry is preconditioned by the intensity of production. Inconsistency with marketing department leads to manufacturing of such products that are unnecessary on the market at all or in the amount they are produced. Transportation system should always have sufficient means and information in order to transport different volume of production to a certain place in a certain time. Economy on such elements as speed, reliability is not always reasonable as well. The main aim of logistics is to harmonize not only the processes mentioned, but also other processes taking place at the enterprise. Having combined all the systems and flows of the enterprise, we will receive one system with one flow that will consist of independent elements. In this case interconnections between the elements will be considerably stronger, and weak elements will distinctly stand out. The system with such interconnections is usually called logistical system. With the help of system approach, there is high possibility to control all the processes of the enterprise starting from supply and finishing with unloading of end products to consumer. Work organization at the enterprise based on the system approach concept allows interconnecting all the subsystems and elements of the enterprise. Thus, it becomes possible to solve conflicts arising between inner systems of the enterprise, eliminate contradictions between functions being performed by subdivisions of the enterprise. Final result of such approach will be reduction of enterprise costs simultaneously meeting consumers' demands. System approach ensures continuity of material flow [3, 5].

Development of marketing caused the development of concept that is based on improvement of service of various products on market that are often needed [5, p. 35–36]. Service plays an important role in satisfaction of buyer's needs. In the context of competitiveness rise, producers pay more attention to service. After-sale support is provided on a higher level, marketing helps to detect most of consumer demands as to support service. With the help of special marketing researches a certain set of services demanded by a consumer can be formed (delivery, installation, consultations etc.). Logistics allows ensuring optimal variant of such services provision with a minimum of costs for enterprise and a maximum of consumer's satisfaction. Support service consists of certain operations or contains a certain set of services. Depending on this set it can be characterized by quality criterion. Service improvement concept implies that product of the enterprise goes together with its support service. Service improvement increases general level of quality of enterprise products. Such an approach is the main driving force for further development of logistics. The main aim of the service improvement concept is to reduce repair time, improve infrastructure of maintenance [5].

At these days reverse or backward logistics gains wide popularity. Main principles of backward logistics concept are support service and maintenance, return of faulty or expired products, modernization and product repair [7, p. 384]. A company may eliminate goods in order to obtain additional profit. For example, “Hewlett Packard”, “Dow chemical”, “General motors”, “Xerox” introduced reverse logistics in order to substitute outdated machinery and recycle wastes [6, p. 303]. Such measures decrease energy costs,

emission of gas or other harmful substances. Backward logistics creates possibilities for raw materials economy. Improvement of logistics takes place as a result of costs reduction connected with support service, on condition that principles of service and reverse logistics are applied. This leads to reduction of general costs and optimization of service backup of a consumer.

Underlying principles of the logistical concept that is based on maximum decentralization of tasks is the increase of products quality and direct responsibility of employees. For this, a high level of automation, certain information possibilities and communicative experience are necessary. Large number of problems arising in logistics organization is connected with human factor. This is caused by insufficiently qualified personnel, bad coordination between subdivisions of the enterprise, complexity and big volume of information than needs to be processed. System approach in logistics, close connections between elements of the enterprise, integration of constituent elements of logistics are being stressed. Logistics concept that is based on maximal decentralization of tasks should be oriented on market demands and form market strategy of the enterprise [2].

Wide popularity of marketing in all spheres of activities, manifestation of its massive character and complexity of physical distribution of products have become the main driving force for logistics concept development based on rigid control of distribution channels [5, p. 36]. Scientific works highlight many issues on problem of marketing environment analysis and sale stimulation. Problems of physical distribution are less highlighted. Intensity of marketing application leads to the increase of warehouse stock of raw and other materials, as well as transitive, insurance, seasonal and goods stocks. It is known that one of the aims of logistics is to decrease all types of stock. Therefore, its increase contradicts the aims of logistics. Increase of warehouse stock is caused by bad interaction between subdivision of the enterprise and lack of mechanisms that control them. Considering concept, based on rigid control of distribution channels, a particular attention is paid to such issues as warehouses location, choice of distribution channels, speed of delivery. It is noted that for reasonable management of resources, choice of optimal location of distribution centers, it is necessary to receive reliable information from the participants of distribution channels. Constant receiving of information from the participants of distribution channels allows synchronizing place and time of delivery.

Let us note that well-known logistics concept “just-in-time” comes from the main principles of the concept based on double control of distribution channels. In many literary sources the term “just-in-time” is equaled or connected with the term “as fast as possible”. In our opinion the “just-in-time” methods requires product movement just at the same time when buyer will immediately take it from supplier or manufacturer at previously agreed place and time. Not earlier or later, but just at previously agreed time. This concept requires obligatory preservation of eight rules of logistics (8R, in some sources 5R, 6R or 7R). Foreign scientist P. Drucker was one of the first to study issue of management of physical distribution of products. In his works an attention is paid to diminishing of resources and storage space accordingly, location of warehouse complexes, divisions of after-sale support, optimal choice of transporting means and routs. Solving these issues will save delivery and product distribution costs.

Today the formation of modern logistics concepts is continuing. The sphere of their application is widening. But general system of thoughts, proves as to their theoretical application is not changing. All logistic transformations are directed to reduction of enterprise costs that together with satisfaction of consumers' needs leads to increase of the effectiveness of enterprise activity. Analysis of the main logistics concepts has revealed that while organizing logistics on enterprises, it is necessary to take into account basis principles of all concepts, thus, in our opinion, a particular attention has to be paid for service improvement concept and concept based on the double control of distribution channels.

Nowadays Ukrainian and foreign scientists describe new logistics concepts in their works, except those that are well-known. Particularly, I. Smirnov in his monograph analyzes the development of logistics step by step and describes new logistics concepts, such as geologistics, “green” logistics [6, p. 18]. Together with the development of logistics concepts, every stage of the development of this science is accompanied with the appearance of new organization and economic forms as well as new types of logistics. The first consulting logistical forms establishing the ground for society and geographical logistics, also known as geologistics, appeared in the beginning of XXI century. Their main aim was to optimize economic processes occurring not only on a microlevel. This refers to the possibility and necessity of logistics application in regional programs of development of national economies, and in order to increase

efficiency of international economic relations. "Green" logistics or ecologistics is being widely promoted. It is directed to finding an environmentally-friendly solution to problems of harmful production in entrepreneurship, environmental protection. Such type of logistics is being successfully applied by such companies as "Toyota" (one of the biggest auto-manufacturers in the world), "Schenker BTL" (the largest logistics corporate group in Europe that has offices in 130 countries around the world).

It is evident that today the development of society causes emerging of new directions of logistics and logistics concepts, such as geologistics, reverse logistics, "green" logistics, ecologistics. In our opinion, the most perspective direction of logistics development is ecologistics, the main principles and aims of which are on the stage of formation and concept of this direction of logistics needs scientific proof.

Constant growth of marketing outlets and irrational management of ecosystems leads to intensive use of natural resources, depletion of natural potential and formation of unfavorable ecological environment. As a result of such approach to business activity an ecological crisis is evident. Therefore, nowadays an important constituent of society development is keeping a balance between modern demands of society and protection of interests of future generations. And search for alternative and innovative approaches to economy management is the most important in order to keep well-balanced and steady development of healthy society. Nowadays steady development is one of the most popular ideologies that can be considered from three points of view, such as economic, ecological and social, and one of the concepts of such ideology, in our opinion, is the concept of ecologistics.

Foreign scientists define the notion of ecologistics in a different way. Some of them equal ecologistics to "green" logistics, on the contrary, others separate these two directions. In particular, G. Yang and H. Pan define ecologistics as one of the directions of modern logistics that integrates economic benefit in the context of socialization and ecologization [9]. A prominent scientist P. Murphy notes that the term "green" logistics appeared as far back as in the beginning of the 1990s and defines it as a new direction of logistics aiming at effective processing and flow of goods having rational character and it also includes measures of environment protection [10]. In his works J-P. Rodrigue provides laconic definition of "green" logistics and considers it as an effective and ecological transporting system of distribution [12, p.339]. Ds. Rogers and R. Tibben-Lembke consider "green" logistics to be a complex of measures directed at the assessment and minimization of ecological outcomes of logistic activity [11, p. 130]. Ukrainian scientist I. Smirnov defines "green" logistics as preservation of ecological safety of a separate consumer and a separate system of the whole society [6]. Scientists Li Yanbo and Liu Songxian view ecologistics and "green" logistics separately and provide wider interpretation of these notions [9, p. 291]. According to them, ecologistics is a system of planning, projection and management using innovative technologies of logistics and methods of ecologistics projection in order to reduce environmental pollution and use of natural resources. And "green" logistics is a new direction that implies the use of progressive technologies of logistics and modern equipment with the aim of minimization of environmental pollution and use of natural resources [9]. In his work Yu. Chartok defines ecologistics as a subsystem of management of product flows from manufacture to end consumer with the aim of harm minimization being caused to the environment as well as minimization of detrimental influence on the environment as a result of business activity on all stages of logistics flows movement [8, p. 228].

So, the analysis of the notions of ecologistics and "green" logistics made it possible to establish that the terms cannot be regarded as equal. Today these two directions are actively developing and formation of their concepts is very important in finding solutions to imminent ecological problems of society. Let us conduct more detailed research of ecologistics and generalize main principles and concepts.

Concept of ecologistics is based on minimization of negative impact on the environment, reduction of the use of non-renewable natural resources. It is a new promising direction of logistics of the future and only main principles of ecologistics will help to protect environment from negative effect and reasonably use natural resources. By negative impact on the environment one should understand not only harmful substances emission, but also noises, vibrations that are caused by road and railway transport, wastes from fuels and lubricative materials polluting air, soil and water, use of packages that are not environmentally-friendly, necessity of utilization of wastes and faulty products [1, p.8]. All of this stipulates negative impact on the environment and damages natural ecosystems. Solution to these ecological problems, first of all, lies in the reduction of the use of natural resources that will automatically lead to reduction of costs,

which is the main aim of logistics. Besides, the concept of ecologistics is necessary to be developed on a global level, since world ecological crisis is inevitable. This will help to undergo imminent ecological problems of society and create all the conditions for improvement of life quality in the future.

Analyzing the main principles of the concept of ecologistics, its main aims can be singled out, mainly:

2. formation of the system of separate wastes collection;
3. introduction of new technologies that foreseen the use of recyclable materials for material resources manufacturing;
4. collection and recycling of packages;
5. active support of enterprises the main field of activity of which is separate wastes collection, recycling, utilization etc. as well as introduction of necessary changes into legislation as to activity of such enterprises;
6. in order to minimize the danger to environment, it is necessary to use natural power more extensively by way of logistical use of climatic peculiarities of a certain region.

The aims of ecologistics, suggested above, should ground on the principles of rational use of natural resources, minimization of the use of raw materials and packages that are not recyclable or cannot be safely utilized, maximum use, recycling and utilization of wastes, active popularization of the principles of ecologization of society among enterprise employees, ecological and economic argumentation of transport resources, reduction of negative impact on the environment using innovations, modern technologies and innovative developments.

**Conclusions and further research prospects.** Despite the unique ability of logistics to increase efficiency of business activity of enterprises, theoretical background of this young science in Ukraine has not been formed. There is no generalized opinion as to definitions of the main terms and natures of this sphere. Today the development of logistics concepts is underway, and one of the main promising directions is ecologistics. Researches have revealed that today there is no distinct and unified definition of ecologistics. It is often equaled with “green” logistics. Many interpretations witness about the development of ecologistics, gradual formation of its main principles, aims and concepts. Foreign and national scientists regard ecologistics not only as a new direction of logistics, but also as one of the factors of its constant development, closely connecting it with ecology. According to the researches, ecologistics is not developed in our country, and ecological problems remain unsolved. Economically developed countries of the world are directing their efforts to achieve constant development and not to increase profits. For this reason it is important to understand the necessity of reasonable use of natural resources and regard economy in view of ecological and social aspects. National enterprises have to start using technologies that meet ecological demands of separate consumers, markets and society as a whole, and they have to consider ecologistics to be one of the most promising directions in logistics development. It may become the basis for constant development of economy and formation of new environment for future generations.

1. Вержбицкий О. Экологистика: экономика + экология / Вержбицкий О. // *Дистрибуция и логистика: всеукраинский информационно-аналитический журнал*. – 2012. – № 10. – С. 8–11.
2. Крикавський Є. В. Логістика для економістів: [підручник] / Є. В. Крикавський. – Львів: Вид-во Нац. ун-ту “Львівська політехніка”, 2004. – 448 с.
3. Миротин Л. Б. Тишбаев И. Э. Системный анализ в логистике: учебник. – Экзамен, 2002. – 480 с.
4. Николайчук В. Е. Логистика: теория и практика управления: учеб. пособ. / В. Е. Николайчук, В. Г. Кузнецов. – Донецк: НОРДПРЕСС, 2006. – 540 с.
5. Окландер М. А. Логістична система підприємства: монографія / М. А. Окландер. – Одеса: Астропринт, 2004. – 309 с.
6. Смирнов І. Г. Логістика: просторово-територіальний вимір. – К.: Обрії, 2004. – 334 с.
7. Чичкан-Хліповка Ю. М. Теоретичні аспекти реверсивної логістики/ Чичкан-Хліповка Ю. М. // *Тези доп. VI міжнар. нау.-практ. конф. “Маркетинг та логістика в системі менеджменту”*. – Львів: Вид-во Нац. ун-ту “Львівська політехніка”, 2006. – С. 383–384.
8. Чортюк Ю.В. Екологічна стратегія логістичної діяльності торгових підприємств / Ю.В. Чортюк // *Прометей: регіональний збірник наукових праць з економіки / Донецький економіко-гуманітарний інститут МОН України, Інститут економіко-правових досліджень НАН України*. – Вип. 2 (23). –

Донецьк: ДЕГІ, 2007. – С. 226–229. 9. Li Yanbo. *The Forms of Ecological Logistics and Its Relationship Under the Globalization* / Li Yanbo, Liu Songxian // *Ecological Economy*. – 2008. – № 4. – P. 290–298. 10. Murphy P. R. *Green logistics: Comparative views of environmental progressives, moderates, and conservatives* / Paul R. Murphy, Richard F. Braunschweig, D. Charles // *Journal of Business Logistics*, 1996. – Vol. 17. – No. 1. – P. 191–211. – [Електронний ресурс]. – Режим доступу: [http://findarticles.com/p/articles/mi\\_qa3705/is\\_199601/ai\\_n8748499](http://findarticles.com/p/articles/mi_qa3705/is_199601/ai_n8748499). 11. Rogers Ds. *An examination of reverse logistics practices* / Ds. Rogers, R. Tibben-Lembke // *Journal of Business Logistics*. – 2001. – № 22 (2). – P. 129–148. 12. Rodrigue J-P. *Green logistics (the paradoxes of)* / J-P. Rodrigue, B. Slack, C. Comtois // *The handbook of logistics and supply chain management*; [Brewer A. M., Button K. J., Hensher D. A.]. – London.: Pergamon, 2001. – P. 339–350.

1. Verzbyckyy O. (2012). *Ekologistika: economy + ecology. Distribucija i logistika: vseukrainskij informacionno-analiticheskij zhurnal*, vol. 10, pp. 8–11. 2. Krykavskyy Ye. (2004). *Lohistyka dlia ekonomistiv [Logistics for Economists]*. L'viv: Vydavnytstvo natsional'noho universytetu L'vivs'ka politehnika. 3. Mirotin L., Tishbaev I. (2002). *Sistemnyj analiz v logistike [System analysis in logistics]*. Moscow: Ekzamen. 4. Nykolaychuk V., Kuznetsov V. (2006). *Logistika: teoriya i praktika upravlenija [Logistics: Theory and Practice of Control]*. Donets'k: NORDPRESS. 5. Oklander M. (2004). *Lohistychna systema pidpriemstva [Logistic System Company]*. Odessa: Astroprynt. 6. Smirnov I. (2004). *Lohistyka: prostorovo-terytorial'nyj vymir [Logistics: spatial-territorial dimension]*. Kyiv: Obrii. 7. Chychkan-Xlipovka Yu. (2006). *Teoretychni aspekty reversyynoi lohistyky. Marketynh ta lohistyka v systemi menedzhmentu: Tezy dopovidej VI mizhnarodnoi naukovo-praktychnoi konferentsii held in Lviv* (pp. 383–384). L'viv: Vydavnytstvo natsional'noho universytetu L'vivs'ka politehnika. 8. Chortok Yu. (2007). *Ekolohichna stratehiia lohistychnoi diial'nosti torhovykh pidpriemstv [Environmental Strategy for logistic activities of trading companies]*. Prometej: rehional'nyj zbirnyk naukovykh prats' z ekonomiky, 2(23), 226–229. 9. Yanbo L., Songxian L. *The Forms of Ecological Logistics and Its Relationship Under the Globalization*. *Ecological Economy*, 4, 290–298. 10. Murphy P., Braunschweig R., Charles D. (1996) *Green logistics: Comparative views of environmental progressives, moderates, and conservatives*. *Journal of Business Logistics*, 17(1). Localized 15 April 2014, pa [http://findarticles.com/p/articles/mi\\_qa3705/is\\_199601/ai\\_n8748499](http://findarticles.com/p/articles/mi_qa3705/is_199601/ai_n8748499). 11. Rogers Ds., Tibben-Lembke R. (2001). *An examination of reverse logistics practices*. *Journal of Business Logistics*, 22(2), 129–148. 12. Rodrigue J-P., Slack B., Comtois C. (Eds.). (2001). *Green logistics (the paradoxes of)*. *The handbook of logistics and supply chain management*. London.: Pergamon.