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## **Theoretical and practical aspects of the logistics application in Ukraine**

### **Teoretyczne i praktyczne aspekty zastosowania logistyki na Ukrainie**

**Abstract.** The article deals with the Logistics Performance Index (LPI) that has been estimated by the World Bank since 2007 to measure effectiveness of international supply chains. Ukraine logistic potential of the period from 2007 to 2018 is estimated and a number of main problems hindering the development of logistics are identified. An integration mechanism that allows maximum coordination of logistics business processes implementation by all the participants in supply chains is proposed.

**Key words:** logistics, logistic potential, business processes, supply chains

**Synopsis.** Artykuł dotyczy wskaźnika wydajności logistycznej (LPI), który Bank Światowy oszacował od 2007 roku w celu pomiaru efektywności międzynarodowych łańcuchów dostaw. W opracowaniu oszacowano potencjał logistyczny Ukrainy w okresie od 2007 do 2018 roku i zidentyfikowano wiele problemów utrudniających rozwój logistyki. Zaproponowano mechanizm integracji, który pozwala na maksymalną koordynację wdrażania procesów biznesowych logistyki przez wszystkich uczestników łańcucha dostaw.

**Słowa kluczowe:** logistyka, potencjał logistyczny, procesy biznesowe, łańcuchy dostaw

## **Introduction**

Logistical processes facilitate the relationships between production and the movement of products. Specifically, logistical processes should address many of the aspects of production, including time, costs and quality. When a company successfully coordinates these logistical processes, the company can track the process through production, consumption, storage and disposal. A logistical process tries to find the best solution for

manufacturing and distributing goods by considering how the market uses these products [Daneshjo 2014].

Lately a great deal of Ukrainian companies uses system approach to business-processes organization and pay considerable attention to implementation of integration logistics management of material flow input and output. It is mainly explained with establishment of commodity market structure and strengthening of competition.

While the Soviet Union the companies were interdependent in the border of the unitary environment. Breakdown of the Soviet Union led to severance of effective intereconomic ties among the companies. The modern period of the Ukrainian economy development is characterized with high level of production separation, lack of elements necessary for provision of non-stop working cycle.

These peculiarities of processes of management determine using logistics that allows to provide coordination of enterprises' activity to achieve the objective.

### **Analysis of the last researches and publications**

The problems of logistic approach on the companies are highlighted in the researches of V. Amitan, D.G. Bauersocks, N. Chornopyska, M. Christofer [2004], A. Deynega, M. Dovba, L. Frolova [2004], A. Hadjinsky [2013], A. Kalchenko, D.G. Kloss, Y. Krykavskiy, D.M. Lambert, R. Larina, M. Oklander [1992], V. Piliushenko, J.R. Stock, D. Uoters [2003], M. Vasylevskiy and others [2008].

However not all characteristics of logistic processes development are fully researched. Therefore, its analysis ought to be in the center of the modern scientists' attention and high level of the problem relevance causes necessity of its further research.

### **The purpose and methods of the research**

The purpose of the article is to recognize the logistics situation in Ukraine and to identify activities that increase effective supply chain management. The following scientific methods are used to achieve the objective: the statistical analysis, the method of comparing statistics from different periods and for different indicators, and the study of their dynamics. The basic source of logistic indicators was Logistics Performance Index (LPI). The LPI is based on a worldwide survey of operators on the ground (global freight forwarders and express carriers), providing feedback on the logistics "friendliness" of the countries in which they operate and those with which they trade. They combine in-depth knowledge of the countries in which they operate with informed qualitative assessments of other countries where they trade and experience of global logistics environment. Feedback from operators is supplemented with quantitative data on the performance of key components of the logistics chain in the country of work.

As a theoretical and methodological basis of the research, scientific publications (monographs, articles) of management specialists were used. The practical significance of the research is to systematize theoretical provisions and their presentation in a logical sequence according to the studied issue.

## The main results of the study

Development of a country is impossible without considering its logistic potential. Logistic potential of a country is determined by Logistics Performance Index. The LPI is an interactive benchmarking tool created to help countries identify the challenges and opportunities they face in their performance on trade logistics and what they can do to improve their performance. The LPI 2016 allows for comparisons across 160 countries.

According to the World Bank data, Logistics Performance Index (LPI) of Ukraine in 2016 was 80 out of 160 countries that is lower comparing with the year 2014 when the Ukrainian position was 61 (Table 1). But even in war conditions Ukraine had the better result comparing with the year 2010, when it took 102 (one hundred and second) place.

Based on the survey of international and national logistics companies main characteristics of logistical system are estimated on a five-point scale: customs registration, quantity of logistics infrastructure, simplicity and price of delivery, competence and quality of services, possibility of cargo tracking and control, frequency of delivery.

Table 1. Logistics Performance Index (LPI) of Ukraine in 2007–2016

Tabela 1. Wskaźnik wydajności logistycznej (LPI) na Ukrainie w latach 2007–2016

Year	LPI Rank	LPI Score	Customs	Infrastructure	International shipments	Logistics competence	Tracking & tracing	Timeliness
2007	73	2.55	2.22	2.35	2.53	2.41	2.53	3.31
2010	102	2.57	2.02	2.44	2.79	2.59	2.49	3.06
2012	66	2.85	2.41	2.69	2.72	2.85	3.15	3.31
2014	61	2.98	2.69	2.65	2.95	2.84	3.20	3.51
2016	80	2.74	2.30	2.49	2.59	2.55	2.96	3.51

Source: World Bank, Aggregated LPI, [electronic resource] <http://web.worldbank.org/WBSITE/EXTERNAL/TOPICS/TRADE/0,,contentMDK:23188613~pagePK:210058~piPK:210062~theSitePK:239071,00.html> [accessed: 15.09.2018].

Ukraine has better results than other post-Soviet countries in the scope of such indicators as: Tracking & tracing and Time-liness. (Table 2). In total, Ukraine took 80 positions in the ranking. In this list, only Kazakhstan has overtaken it.

Table 2. Logistics Performance Index (LPI) in 2016 in selected countries

Tabela 2. Wskaźnik wydajności logistycznej w 2016 roku w wybranych krajach

Country	LPI Rank	LPI Score	Customs	Infrastructure	International shipments	Logistics competence	Tracking & tracing	Timeliness
Kazakhstan	77	2.75	2.52	2.76	2.75	2.57	2.86	3.06
Ukraine	80	2.74	2.30	2.49	2.59	2.55	2.96	3.51
Moldova	93	2.61	2.39	2.35	2.60	2.48	2.67	3.16
Russian	99	2.57	2.01	2.43	2.45	2.76	2.62	3.15
Belarus	120	2.40	2.06	2.10	2.62	2.32	2.16	3.04
Georgia	130	2.35	2.26	2.17	2.35	2.08	2.44	2.80

Source: World Bank, Aggregated LPI, [electronic resource] <http://web.worldbank.org/WBSITE/EXTERNAL/TOPICS/TRADE/0,,contentMDK:23188613~pagePK:210058~piPK:210062~theSitePK:239071,00.html> [accessed: 15.09.2018].

According to the experts' opinion low performance of Ukrainian logistics is connected with high level of port charges and tariffs. European countries take the leading places. Germany has taken the first place since 2007. The other leading countries are Luxemburg, Sweden, Netherlands and Singapore. The worst countries for logistics are Syria (1.6), Haiti (1.72), Somali (1.75), Mauritania (1.87). However, in 2018 the World Bank assessed total LPI based on the data of 2012–2018 years, that allowed to compare 167 countries. Ukraine gained 11 points and took the 69th place as it got 2.83 scores. Ukraine is between Serbia and Egypt and among the post-Soviet countries comes the 4th after Estonia, Lithuania and Latvia (Table 3).

The leader is Germany with the total LPI Score of 4.2. Sweden, Belgium, Austria and Japan are after it. Then come Singapore, Denmark, Great Britain and Finland. In conditions of market economy, the main problem for the suppliers is increasing of sale organization level and for the consumers is logistics minimization of expenses on purchase and products delivery [Bowersox and Closs 2008]. On this stage it is important to form favorable conditions for optimization of companies' interaction with customers, investors, organizations of suppliers and transport structures.

Table 3. Logistics Performance Index (LPI) in 2018 in selected countries in selected countries  
Tabela 3. Wskaźnik wydajności logistycznej w 2018 roku, w wybranych krajach

Country	LPI Rank	LPI Score	Customs	Infrastructure	International shipments	Logistics competence	Tracking & tracing	Timeliness
Estonia	36	3.30	3.30	3.13	3.19	3.15	3.20	3.80
Lithuania	43	3.20	3.02	3.00	3.03	3.10	3.25	3.78
Latvia	55	3.02	2.93	3.03	2.97	2.92	3.06	3.25
Egypt	60	2.95	2.67	2.91	2.94	2.95	2.91	3.30
Serbia	68	2.83	2.53	2.59	2.89	2.78	2.86	3.32
Ukraine	69	2.83	2.46	2.38	2.77	2.76	3.08	3.45

Source: World Bank, Aggregated LPI, [electronic resource] <http://web.worldbank.org/WBSITE/EXTERNAL/TOPICS/TRADE/0,,contentMDK:23188613~pagePK:210058~piPK:210062~theSitePK:239071,00.html> [accessed: 15.09.2018].

The main reasons of low intensity of logistics implementation to the practice of management are following:

- breakdown of stable production connections and high decentralization of management in the period of the Soviet Union disintegration. Insufficient state support of Ukrainian companies, lack of state programs of cities and regions development and provision of the inhabitants with accessible dwelling;
- negative influence of the world financial crisis of 2008–2009;
- political and economic instability and imperfection of the branch legislation; corruption on the stage of getting permit documentation;
- ineffective use of strategic approaches to business management;
- distrust in partner relations that restrains development of integration mechanisms.

Modern practice of management is characterized with intensive transformation from management of separate logistic functions or operations to management of business-processes that demands implementation of integration logistics concept. Logistics of business-process is an interconnected complex of operations and functions that change over

resources of the company into the result according to logistics strategy of the company [Amitan et al. 2003]. Logistics of the company's business-processes are concentrated on the planning and coordination of material flow, purchase, production and delivery of products to consumers company [Frolova 2004].

Therefore, it is important to work out mechanisms of informational interaction of participants of delivery chain. Its application allows achieving maximum coordination of logistics operation fulfillment, providing coordination of actions of all the participants of the company's delivery process. Such an approach can be implemented on the basis of integration as a union of participants of logistics chain with the purpose of organization of balanced movement of material, informational and financial flow.

There are two types of integration: internal and external integration. Internal integration is interaction and coordination of logistics flows within the company. External integration means optimization of logistics flows by means of intereconomic relations of the organization among the companies of one or different branches that stipulates their mutually profitable cooperation. Stages of integration mechanism implementation are shown on Figure 1.

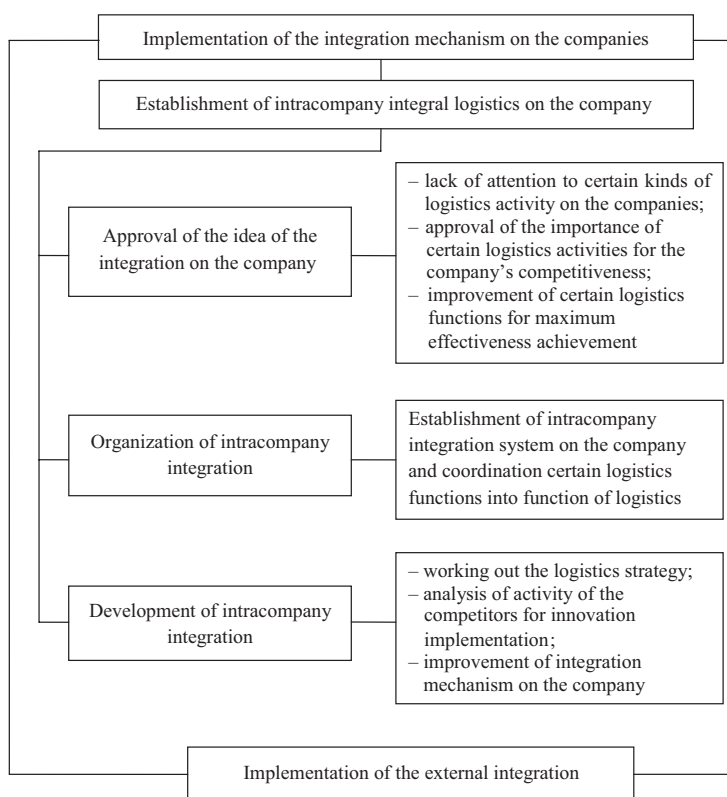


Figure 1. Mechanism of the integration process

Rysunek 1. Mechanizm procesu integracji

Source: Results of own research.

On the first stage it is necessary to establish effective intracompany integral logistics. On the second stage there is a process of intercorporation interaction organization. Implementation of internal integration demands establishment of connections between logistics operations that correspond different functional spheres. The task of the company's logistics organization: formation of relations among functional spheres of the company's logistics as well as among the personnel of functional departments for optimal supply of logistics system of companies' purposes achievement. There are special departments in the company that are responsible for certain kind of logistics activity (delivery, transportation, storage).

The main advantages of logistics integration:

- profit increasing by decreasing of total costs of companies' resources;
- more productive use of companies' resources;
- improvement of the results of the company's marketing activity;
- increasing of the effectiveness based on cut of stocks, decreasing of debit indebtedness and increasing of cash flow.

## Conclusion

Effective management of business-processes in enterprises allows to shorten stocks, provide control over the volume of incomplete production, decrease risks, fasten material flow and capital turnover, provide coordination of material-technical resources delivery, production and technological packing that leads to high effectiveness of the whole production cycle.

Using logistics in the enterprises demands significant changes of the internal and external environment of the company: development of new organizational forms, using controlling and outsourcing, improvement of estimated pricing method. Logistics introduction allows to make the market more predictable for the customer, to minimize expenses, risks and losses of investment companies while realization of investment cycle.

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