

## LOGISTIC NETWORKS AND GLOBALIZATION CHALLENGES

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**Abstract:** The objective of the article is an attempt to identify the term *logistic networks* in the context of the analysis of networks and logistics concept as the basic components, as well as the specification of the main challenges for international logistic networks, resulting from the changes occurring in the global economy system as a result of globalisation. The article focuses on two main concepts. The first one is the analysis of logistic networks as a special case of networks, where individual participants are autonomous, cooperating and competing entities, and the network itself has a large variability both in terms of participants' fluctuation and structure. The second concept narrows the analysis area to logistics networks that are derived from networks and supply chains. The adoption of this approach results in targeting primarily cooperation systems.

**Keywords:** logistics, international logistics, logistic networks, supply chain.

## SIECI LOGISTYCZNE I WYZWANIA GLOBALIZACYJNE

**Streszczenie:** Celem niniejszego artykułu jest próba zidentyfikowania pojęcia sieci logistyczne w kontekście analizy koncepcji sieci i logistyki jako podstawowych składowych, oraz wskazanie głównych wyzwań dla międzynarodowych sieci logistycznych wynikających ze zmian zachodzących w systemie gospodarki światowej pod wpływem globalizacji.

W artykule skoncentrowano się na dwóch głównych koncepcjach. Pierwszą z nich jest analiza sieci logistycznych jako szczególnego przypadku sieci, gdzie poszczególni jej uczestnicy stanowią podmioty autonomiczne, współpracujące i konkurujące ze sobą, a sama sieć posiada dużą zmienność zarówno pod kątem fluktuacji uczestników, jak i struktury. Druga koncepcja zawęża obszar analizy do sieci logistycznych będących pochodną sieci i łańcuchów dostaw. Przyjęcie tego podejścia skutkuje ukierunkowaniem przede wszystkim na systemy kooperacji.

**Słowa kluczowe:** logistyka, logistyka międzynarodowa, sieci logistyczne, łańcuch dostaw.

## 1. Introduction

The subject of the network is a frequently treated subject of research and analyses among contemporary researchers, which is reflected in the adoption of the so-called network paradigm. The phenomena related to this area have been the subject of a significant number of studies; despite that there is still no consensus in both in the terms of its definition and interpretation. This points to huge developmental dynamics of the aforementioned area. Although the network phenomenon is not new in the economy, the quantity of its determinants and the resulting effects is so huge and variable that it is constantly full of new occurrences in this scope, which are an open research field with interdisciplinary character.

One of the analysed areas are logistic networks, combined with a concept of organization of logistic flows in the networks of co-operating entities. Apart from the huge quantity of varied approaches, one can distinguish two main concepts among the conducted research analyses. The first one is the analysis of logistic networks as a specific network type, in which individual participants are independent entities, co-operating and competing with one another, and the very network is characterised by high variability both in terms of participants' fluctuation and in the terms of structure. The second concept narrows down the area of analysis to logistic networks which are the derivative of supply networks and chains. The adoption of such approach results in the focus mainly on co-operation systems with a restricted competition system within the network, the increase of system stability, especially with reference to participating entities (the perspective of long-term co-operation, relative durability of relations and participation), with the preservation of structural flexibility and the emphasis on the central and peripheral part. Under this approach logistic networks are a narrower term than the supply networks.

The objective of this article is an attempt to identify the term *logistic networks* in the context of the analysis of networks and logistics concept as the basic components, as well as the specification of the main challenges for international logistic networks, resulting from the changes occurring in the global economy system as a result of globalisation.

## 2. The concept of a network

The network approach started to be used in economic activity in the 20th century as a result of technological changes and increasing international competition. Its essence is the totality of relations between the company and the environment, which create a network of relations (Ratajczak-Mrozek, 2009, s. p. 7-11) on the basis of a general theory of systems, created by L. von Bertalanffy. This theory points to the need of integrating social and natural sciences and

it prefers a network approach based on the co-operation of constitutive elements of the system (von Bertalanffy, 1950, p. 134-164). The bases of network thought methodology were proposed by P. Gomez, G. Probst and H. Ulrich (Zimniewicz, 1999, p. 104-109). Their concept is based on the following elements:

- parts and a whole – the system is a dynamic whole composed of the parts which join on one greater whole, thus forming system hierarchy,
- networking – there are numerous interdependencies between the systems, leading to system growth, shrinking or stabilisation,
- openness – mutual and multilateral interdependencies are present within the system and in relations with its environment,
- complexity – the systems can adopt many different condition in a specific period of time,
- order – system template can be saved and interpreted, and the existing rules restrict the freedom of the parts and the whole,
- directionality – system self-control capacity, i.e. ability of control and regulate itself,
- development – introduction of modifications on the basis of evaluation.

The essence of the network approach is based on the idea of exchange and mutual trust, which are the basis of system flexibility and competitive power growth (Łupicka, 2009, p. 65) “The paradigm inspiring network forms is based on the leading role of relations initiated between to constituent parts of the organization, the flexibility of roles assigned to the participants belonging to various parts at the same time and the privileged character of organizational dynamics in relation to structural forms” (Strategor, 1999, p. 392). Thus the establishment of appropriate relations is of fundamental importance for network creation. The problem of relations with a network character is the subject of reflections by M. Porter (among others), who formulated the clusters theory. The clusters are geographical concentrations of mutually related enterprises, specialised suppliers, and companies operating in related sectors and branches, as well as related institutions, either competing or co-operating with one another (Porter, 2001, p. 246). According to W. Czakon, the networks one hand can be understood as the specimen of interaction between enterprises and on the other hand as relatively stable configurations if relations between the organisations, which are strategically important for participating entities (Czakon, 2012, p. 48). These two overlapping approaches seem to be the essence and the starting point for the identification of contemporary economic networks.

W.W. Powell defined the networks from the organizational perspective as intermediate forms in the continuum between the market and the hierarchy, in which the internal relations, despite their dynamical character, are also the basis of access barriers to the existing system (Powell, 1990, p. 295-336). Yet another useful definition is the conclusion that “the network is a collection of means (infrastructure) and principles (infostructure), enabling the entities that

have access to them to embark upon the realization of joint projects, provided that these means are adequate for their needs and can be jointly used (infoculture) by the network” (Łupicka, 2006, p. 150). The usefulness and the effectiveness of the network have become the basis for abundant research, which is expressed by the increasing number of studies and increasingly varied approaches. On the basis of literature review it can be determined that the most frequent basic features characterising network systems include:

- mutual co-ordination of activities and the adaptation in the area of procedures concerning activities, technology, infrastructure, etc., i.e. the interior of the organization (Holm, Eriksson, Johanson, 1997, p. 244)<sup>1</sup>,
- a specific system of dependencies between the organizations (Mattson, 1999, p. 244)<sup>2</sup>,
- the decisions concerning the resources are made not only individually, but also jointly in the selected area of co-operation (Łobos, 2005, p. 169-175),
- the possibility of reduction of transaction costs,
- repetitive character of exchange and the measurement of activity in the longer time scope (Gulati, Gargiulo, 1999, p. 1439-1493)<sup>3</sup>,
- access to information about partners<sup>4</sup>,
- creation of the added value (Holm, Eriksson, Johanson, 1997, p. 246-247),
- synergistic potential of the partners and the conviction on the possibility of obtaining synergistic effects under the system,
- extension of the scope of strategic choices,
- flexibility and dynamics of the system and the lack of strictly defined borders<sup>5</sup>.

Under the research of industrial networks B. Axelsson and G. Easton (Axelsson, Easton, 1992, p. XIV) conclude that the network is a model or a metaphor describing a huge quantity of connected entities, engaged in economic processes, which concern the transformation of resources into products, or services consumed by the final customer (a person or an organization). These relations are usually long-term ones and they are mainly based on the exchange of resources at the disposal of network users; they mainly cover the exchange and adaptation (transformation) processes (Wincewicz-Bosy, Wrocław 2012, p. 104-105). The existence of such relations is the basis for network existence, since they ensure its relative stability. The special role is played by: access to resources and individual relations, which have become the basis for the establishment of relations between organisations, and especially between the sellers and the buyer (Easton, 1992, p. 3-27). These two elements are basis for the creation of network value. Various possibilities of realization of synergistic effects are thus

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<sup>1</sup> Not encountered in market exchange.

<sup>2</sup> The existence of dependencies between the organizations, which are most often positive.

<sup>3</sup> The assumption of non-one-off character of co-operation. The realization of a given system of co-operation usually means that this system shall be repeated in similar conditions and with a similar configuration.

<sup>4</sup> Such information is made available to the participants of a given network.

<sup>5</sup> The variability of quantity and the time of action, the possibility of numerous reconfigurations.

created, resulting from jointly performed activities that enable the unique combination of tangible and intangible resources (sharing the resources that are available within the network). Co-operation under the network lasts as long as it is required by joint interest of its participants. When new possibilities appear, network participants initiate actions on the basis of independent decisions. This means that they do not have to continue co-operation with the network in the new initiatives area. They can use the partners from the network for establishing their position on a new market or perform the activities within a new configuration of entities. Situations also can be observed, in which the entities previously co-operating under a network start to compete in a new area.

The objective of the network is to increase the possibility of achievement of adopted goals and potential benefits, as well as the restriction (minimisation) of threats. An essential area creating and strengthening positive effects for network participants is the co-dependency of logistic processes and their co-ordination in the scale of the whole network and not only in the area of individual relations. This creates the conditions for the implementation of logistics management (management of the logistics area within the network) and logistic management as a general concept of network management (Szołtysek, 2005, p. 70-72).

### **3. International logistics**

At present the indispensable element for the effective network operation is the use of logistics concept, perceived as the systems of planning, management and control of integrated flows of physical goods, capitals and information (also including ideas) – from the moment of their creation up to final links; this enables their co-ordination on the selected levels of entities integration, taking into account their individual needs within a defined economic space” (Wincewicz, 2000, p. 43-44). Logistics is the most frequently identified as a microeconomic phenomenon, which results from its classical definition that assigns it to the area of enterprise operation or to the establishment of relations with direct co-operating parties. Under such approach, logistics is understood as the processes of physical flow of material goods-resources, materials, semi-finished products, finished products – in an enterprise, and also between the enterprises, as well as the flows of information streams reflecting material processes and used for the control of these processes (Skowronek, Sarjusz-Wolski, 1995, p. 16). According to the Council of Logistics Management or the European Logistics Association, logistics is the process of planning, organization, execution and control of effective and economically efficient flow of resources, materials, finished goods and appropriate information from the point of origin to the point of consumption with the view to satisfying customer’s requirements, upon minimum costs and minimum capital involvement. Such understanding of logistics enables an enterprise- both the domestic and the international one- to ensure availability and to deliver the

right product, in the right quantity and condition to the correct location and at the correct time to the correct customer and at the correct cost, in compliance with 7R formula.

Contemporary logistics is a specific concept, a philosophy of managing actual processes (flow of goods) based on the integrated, systemic approach to these processes. Thus it is a branch of economic science, examining the regularities and phenomena of the flow of goods and information in the economy, also within its specific chains. The interdisciplinary character and flexibility of logistic solutions and the adaptation possibilities of the models and methods offered by it contributed to the enormous growth of this discipline.

The impact of globalisation and international integration as well as the progress in the area of information broadcasting technology has led to the popularisation of consumption patterns. Thanks to logistics they can be satisfied on local markets, even if they are created at the global or international scale. Technological progress enables the functioning on “the global, local market” (Szymczak, 2004, p. 8-10). This resulted, among others, in the term international logistics.

There is no single definition of international logistics among the researchers of logistic phenomena. It is often defined as the process of planning, realization and control of the flow of goods and information between the specific countries (Kozmiński, 1999, p. 158). E. Gołemska has concluded that it is “the management of international chain of supplies (Witkowski, 2003, p. 17)<sup>6</sup> understood as the combination of the logistic activity of companies which are the links of the supply chain, especially the operating, financial and marketing function of logistic management, and the control of the physical flow of goods, cash and information across the borders and across different countries” (Gołemska, Szymczak, 2004, p. 15). According to E. Płaczek, international logistics can be viewed in three aspects (Płaczek, 2006, p. 11): the functional, the institutional and the process-related one. The functional aspect mainly concerns the analysis of functions and processes of goods transport as well as the analysis of information that take place in time and space between the point of shipment and the customers (warehousing, transport, designation). The institutional aspect concerns the problems resulting from the need of creation and operation of all units that have been established with the view to the performance of logistic tasks. The area of interest of the process-related aspect includes all changes resulting from the new conditions of operations of the global economy. Regardless of the definition approach, international logistics is characterised by:

- overcoming barriers: geographical, political, legal, administrative, cultural, technical and time-related ones,
- multiple crossing of the borders,
- using different means of transport as well as different warehousing and storage systems,

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<sup>6</sup> The chain of supplies is formed by co-operating mining, production, commercial, and service companies from different functional areas as well as their customers, with products, information and funds flowing between them.

- greater scale and variation of enterprises in relation to national logistics (e.g. in terms of the mass of transported goods, the number of participants, the distances, the documents, exchange rate and language differences),
- the impact of the organization and the institution with a supranational character.

A crucial problem of international logistics is the location of specific entities. The decisions concerning the location of facilities belong to the group of strategic decisions, i.e. the decisions resulting in significant changes which are hard to reverse within the whole enterprise system. The list of factors which impact the location of facilities shall be individually adapted to each situation and related to the specifications of an investment. However, it can be noted that some factors belong to the group which is most frequently included in enterprise analyses. The main element decisive for the adoption of a correct location decision is joint co-ordination of all factors. The main location factors include:

- distance from sales markets,
- cost of transport and handling,
- availability of the adequate means of transport and related costs (Private Trucking..., 1980, p. 125),
- availability of foreign services and the conditions of their provision,
- stocks maintenance costs,
- maintenance of an adequate level of customer's service,
- the costs of construction and exploitation of facilities,
- availability of production factors (capital, land, work) as well as the cost and conditions of their use,
- foreseeable development of the market situation and the company strategy.

Thus international logistics can be perceived as the processes of configuration, co-ordination and optimisation of all flows at the international scale on the basis of the analysis of reactions between different organizations (enterprises, institutions, etc.), created on the basis of the implementation of the idea of a logistic chain.

#### **4. Logistic networks**

If we assume that the network in the organizational approach is defined as “the interaction between the co-operating or competing companies that react to the changes in a flexible manner, thus forming different organizational configurations and that adequately adapt the scope and intensity of relations” (Witkowski, 2010, p. 21), then the use of the logistics concept becomes a sine qua non condition in relation to their effectiveness and efficiency, especially at the

international scale. Therefore it can be concluded that a logistic network can be considered to be a specific network case.

When we assume that logistic networks are the sets of relations created by logistic chains and relations between them and other network participants, the starting point for the analysis of logistic networks is the identification of a logistic chain concept. According to E. Gołemska, “a logistic chain being a logistic basis as a warehousing and transport chain which – with IT support – forms a technological connection of warehousing and handling points on goods transport routes, as well as provides organizational and financial co-ordination of logistic operations, including ordering processes and the inventories policy” (Gołemska, 2009, p. 137) together with the information indispensable for its efficient and effective operation. The logistic chain is the basis for the identification of specific processes and accompanying services. This is especially important in the case of identification of redundant elements (links) – e.g. the ones which are doubled, the elimination of which shall lead to the increase of optimisation level of the whole process. It also supports the decisions concerning mutual relations and co-ordination between specific entities forming its links. The most important element is the adequate integration level, which does not only concern the processes from the technical perspective, but also from the perspective of qualitative integration (e.g. the exchange of information and its interpretation). Appropriate management of the logistic chain significantly impacts the service level offered to the final customer, and thus it contributes to the increase of competition level of all its links and partners.

The logistic network means a group of independent entities that compete and co-operate with one another with the view to improving effectiveness and efficiency of the flow of physical goods as well as accompanying information, in compliance with customers’ expectations (Witkowski, 2000). M. Ciesielski defines logistic networks as “the groups of independent entities co-operating with one another in the area of raw materials, materials and finished goods flows” (Ciesielski, 2002, p. 9). The logistic network requires integrated planning, organisation and realisation of material flows between multiple nodes (Kramarz, 2015, p. 84). The co-operation of a huge number of entities leads to the need to integrate flows, and thus apply logistics management. On the other hand, the logistic tasks of network entities in the area which is an element of the network system have to be subject to the concept of logistic network management. In “logistic network the management of logistic processes is moved from the level of co-operating production and commercial enterprises to the level of logistic organisations (Kramarz, 2015, p. 85)”. Logistic networks enable:

- the use of resources available within the network (own ones and belonging to partners) as well as complementary capabilities, experience and expertise,
- reduction of costs, especially infrastructural and transactional ones,
- increasing flexibility, creativity and adaptability,
- reduction (shortening) of process time,

- using logistics as the essential determinant of existing processes as well as created systems and sub-systems,
- increasing efficiency and effectiveness,
- increasing the competitiveness level,
- optimisation of the level of inventories and increasing the possibility of using the Just In Time system,
- the increase of time and place usefulness.

Their greatest flaws are related to the need to initiate co-operation, and thus transferring competences and providing resources to the third parties. The following potential threats related to the participation in logistic networks are enumerated:

- appearance of a dishonest partner,
- the need to trust the third parties,
- dependence on partners,
- increase of conflict level,
- unequal division of benefits and risks.

As stressed by G. Szyszka, there are not only co-operating enterprises within logistic networks, but also the ones that compete for the partner status (Szyszka, 03.11.2017). This situation contributes to the perishability of partner relations and co-operation links, which impacts huge network variability. The co-operation and rivalry result from the efforts aimed at increasing customer's service level, thanks to which competitive opportunities are increased. This is reflected in the search for the most optimum chain configuration. Apart from the factors of endogenous nature, also exogenous factors can impact the configuration of logistic chains, such as (Wincewicz-Bosy, Stawiarska, Łupicka, 2017, p. 39-47):

- mega trends,
- international environment,
- technological progress,
- client/ consumer power.

The situation in the global economy is especially important for logistic networks with international scope, since it is de facto the main area of their activity. The changes occurring in the global economy system and its subsystems directly impact the change of logistic networks configuration.

## **5. Globalization as the developmental factor of logistic networks**

The advancement of the globalisation process and the existence of phenomena related to it are of special importance for the location of links within the configuration of logistic networks

operating at the international scale. The globalisation is the basic mega trend that determines the contemporary operation of the global economy. “The term global economy can mean the collection of various organisms and institutions that operate both at the national and international level, i.e. regional, supraregional and global – which are directly or indirectly engaged in economic activity and which are combined in a certain complete system through the network of international economic relations (Kisiel-Łowczyc, 1999, p. 9). The characteristic feature of contemporary economic phenomena is the difficulty in defining and determining their unequivocal parameters. It is a consequence of development of various scientific areas which may overlap one another and which every time more often acquire an interdisciplinary character. A. Zorska defines the globalisation of economic activity as “the long-term global process of integration of an increasing number of national economies beyond the borders, thanks to the widening and intensification of mutual connections (investment, production, commercial, co-operation ones), as a result a global economic system is created, characterised by high interdependency and significant repercussions of activities which are initiated/ conducted even in distant countries” (Zorska, 1998, p. 20). J. Stiglitz states that globalisation is “a stricter integration of states and people in the world, caused by a huge reduction of transport and telecommunication costs as well as the elimination of artificial barriers to the flows of goods, services, capital, knowledge and persons from one country to another” (Stiglitz, 2006, p. 26).

It can be assumed that the globalisation means “a long-term process of integration of national economies, sectors, markets and enterprises thanks to the extension and intensification of cross-border commercial, institutional, co-operation and information relations, which leads to the formation of increasingly stronger interdependencies in global economy” (Rymarczyk, 2010, p. 440), an integral element of which is the development of logistic networks. It is especially important in the context of analysis of globalisation phenomenon in relation to the flows of physical goods and information. The development of global logistic networks on one hand contributes to the creation of global products and on the other hand it contributes to increasingly more popular customisation. Apart from that, the creation and improvement of logistic networks serves for the optimisation of eight key processes (Cooper, Lambert, Pagh, 1997):

- managing customer relations,
- managing customer’s service level,
- managing demand,
- order performance,
- managing production flow,
- managing provisions,
- product development and its commercialization,
- managing returns.

Especially significant factors related to the impact of globalisation on logistic chains and networks include (Szymczak, 2015, p. 42-43):

- the polarization of markets in terms of their attractiveness, combined with simultaneous increase in consolidation and regionalisation level of economic activity,
- the pressure of competition in the conditions of short-term competitive advantage,
- the increasing concentration of population in the cities and the increase of economic importance of the cities, and especially of metropolitan areas,
- the increasing number of regulations concerning waste management and environmental protection.

Globalisation forces economic entities, and also all market participants to take into account the factors which are created not only by the closest environment, but also by macroeconomic environment (including international and global one). Even when operating locally it is necessary to take into account international or global determinants (e.g. safety standards, communication technologies- especially the Internet). The changes in international environment significantly impact the operation of the markets and their participants. In recent years the processes of international integration and disintegration that translate into the location of specific links within logistic networks have gained special importance. The inclusion of a given area into an integrative group is the basis for the consideration of network reconfiguration. If the integrative group starts to strengthen the access barriers to the internal market, it will be necessary to reconstruct the logistic network in a manner which ensures the most optimum access to the internal market to its participants. The change shall concern the strengthening of the role of entities – network participants that are already present on the integrating area or the search for a new partner that offers more advantageous conditions of access to the market.

Global competition forced the move from the concept based on the reduction of costs and production process flexibility with the reduction of inventories to the approach focused on flexibility, cost optimisation, increase of quality and innovation (Tan, 2001, p. 39-48). As a consequence, this leads to the need of establishment of strategic partnership based on integration, trust and involvement of participants, innovation- and thus the promotion of logistic networks. At the same time innovation does not only concern the development of new products. It is also related to the creation of innovative operation systems and structural solutions. Joint search for and the elimination of critical points and weaknesses, the increase of the flow co-ordination level, especially in the context of international locations makes it indispensable to use not only logistics, but also the concepts based on expertise and state-of-the-art technologies. A specific example are the solutions using artificial intelligence which form an essential element of development of contemporary logistic networks.

The international logistic networks operating today have to be characterised by flexibility. Taking into account the scope and the number of links, it is extremely hard to achieve, especially when the chains have a global scope. Flexibility especially important in the context

of rapid and dynamic changes of the environment, continuous fragmentation of global markets, as well as increased requirements of the consumers, who every time more often participate in designing products and services and who at the same time demand more personalised goods, adapted to their needs (Vonderembse, Uppal, Huang, Dismukes, 2006, p. 223-238). The flexibility of logistic networks does not only concern the system as a whole, but also specific business processes of which it is composed. In this context it means the capacity of a business process consisting in effective management and reacting to changes in such a manner that leads to the lowest time losses, quality costs and losses of efficiency (Viswanadham, Srinivasa Raghavan, 1997, p. 135-163). For logistic networks this means both the flexibility in the area of operation of specific member entities and also the flexibility of creating a relation between them. A special area of flexibility is the possibility of network reconfiguration and establishing relations with new entities. At the same time it should be remembered that the entities that do not keep pace with the changes shall be eliminated from the network.

## 6. Summary

At present the term logistic network means a group of independent entities that compete and co-operate with one another with the view to improving effectiveness and efficiency of the flow of physical goods as well as accompanying information, in compliance with customers' expectations. This requires integrated planning, organisation and realisation of material flows between multiple links of such structure. Logistic networks, which are combined by the researchers with a concept of organization of logistic flows in the networks of co-operating entities, are one of the areas of research investigation. Among a huge quantity of different approaches to this phenomenon that can be found in the literature, created on the basis of conducted research analyses, two main approaches can be discerned: the first one is the analysis of logistic networks as a specific network type, in which individual participants are independent entities, co-operating and competing with one another, and the very network is characterised by high variability both in terms of participants fluctuation and in the terms of structure. The second concept narrows down the area of analysis to logistic networks which are the derivative of supply networks and chains.

The last century, which was characterised, among others, by the fast progress of technological changes and increased competition at the international scale, was the period in which the network approach started to be used in economic activity more frequently. Its essence is based on the ideas of exchange and mutual trust, which are the basis of system flexibility and competitive power growth of the network. In such a situation, the establishment of appropriate relations between network participants has acquired a fundamental importance for network creation. The researchers concluded that the existence of such relations is in fact the basis of

network existence, since it guarantees relative stability to the network, while the major role is played by: access to resources and individual relations, which have become the basis for the establishment of relations between organisations, and especially between the sellers and their customers. These two elements are presented as the basic ones for network value formation.

At present the indispensable element for the effective network operation is the use of logistics concept, perceived as the systems of planning, management and control of integrated flows of physical goods, capitals and information (also including ideas) – from the moment of their creation up to final links. This enables their co-ordination at the selected level of integration of entities, taking into account their individual needs within the defined economic space. When we assume that logistic networks are the sets of relations created by logistic chains and relations between them and other network participants, the starting point for the analysis of logistic networks is the identification of a logistic chain concept, which is the basis for the determination of specific processes occurring in it and accompanying services.

The situation in the global economy is especially important for logistic networks with international scope, since it is the main area of their activity. The changes occurring in the global economy system and its subsystems directly impact the change of logistic networks configuration. Therefore the international logistic networks operating today have to be characterised by flexibility. It is especially important in the context of rapid and dynamic changes of the environment, continuous fragmentation of global markets, as well as increased requirements of the consumers, who every time more often participate in designing products and services and who at the same time demand more personalised goods, adapted to their specific needs. For logistic networks this means both the flexibility in the area of operation of specific member entities and also the flexibility of creating a relation between them. In this context the possibility of network reconfiguration and of initiating relations with new entities is of special importance, since – as confirmed by the observations of contemporary economy – the entities and organizations which do not keep pace with the occurring changes are eliminated from the network.

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