Globalization and international logistics

1. **INTRODUCTION**

The current logistics operations, due to overall globalization of economy have become multi-dimensional and multi-faceted with a tendency to cross state borders. Managing such logistics needs to be focused on the integration of internationally dispersed activities and the units that are responsible for their implementation. The areas which determine the efficiency of international logistics are processes taking place within operational, marketing and financial operations, that result from the costs of logistics and information.

2. **CONDITIONS OF FUNCTIONING AND DEVELOPMENT OF LOGISTICS IN THE GLOBAL SCALE**

The social, economic, technical and political-legislative forces of globalization influence all fields of enterprise functions, including the growth in the complexity of managing the supply chain.

Globalization is (among other things):

- contrast, meaning - on one hand - the desire to integrate, on the other - to differentiate (integration manifests itself in merging, collaboration and cooperation of various economic entities, differentiation is mainly the diversified economic development of respective countries);
- selectiveness manifesting itself in the fact that mainly the developed countries are involved in globalization, and some with middle GDP income;
- polarization – visible in the division of the world into the rich and developed part, and the predominant part that is poor and not much developed;
- development and liberalization of international trade;
- marketing of the economies, the liberalization and privatization;
- freedom of capital flow;
- integration of financial markets;
- standardization and internationalization of production, services and finance;
- the increasing role of international organizations and groups.

Globalization and internationalization are now such common phenomena that increasingly more often, when using the notion of a *market*, we mean the entire world, not just one particular economy. Today, the real test of company management efficiency, for many businesses, is the ability to develop and implement an effective global strategy. Many factors push companies around the world towards globalization, understood as expansion into foreign markets\(^3\). At the time when the company is transformed successively from the local

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1 Andrzej Szymonik PhD (dr hab. inż.), Lodz University of Technology, the Faculty of Organization and Management, Division of Production Management and Logistics.
(national) into an international one, and then a global one, it begins for instance, to import materials and components from around the world, manufactures its products in any country, and sells them on many markets, making certain amendments where necessary, to match the product to the local requirements.

The period of globalization, which began to grow in strength in the second half of the twentieth century, characterized by the largest wave of mergers and takeovers, strategic alliances and the growth of partner business network that included international organizations. The synergy of joint companies led to improved business outcome, the example of which can be the combination of the reputation of the German group Volkswagen and the brand of Skoda in the Czech Republic, which had a positive impact on the latter. Similarly, the use of knowledge, skills and technology has enabled Volkswagen to raise productivity and improve product quality. In the markets of Europe (including Poland4), China, India, the best-selling cars in the past few years are those produced in the Czech brand Skoda5.

Thus, we may say that globalization of a given enterprise means the integration of operations that are internationally dispersed and the units that represent them; this becomes an implication for partnerships, including those regarding logistics activity in the global supply chain6.

The global supply chain management is about combining all operations performed by all the links in order to transform raw materials and semi-finished goods into finished products, delivering them to the customers worldwide, along with appropriate service7.

The logistic processes carried out within the supply chain show a common tendency to cross national borders, which entails significant modifications of the relationships that occur within, e.g.8:

- expansion of mutual relations via tighter links within the information systems used by consignors and carriers of goods, customs offices and agencies;
- increasing emphasis on the need for constant monitoring of international flows of products in order to secure import supplies;
- increasing the efficiency requirements for the links in order to provide deliveries for the markets located in the remote parts of the world.

The global economy leaders are those companies which are targeted at the needs of their “global” clients. For these customers, the goal of purchase are the products which seem ideal in terms of their quality, technology or functionality, and which may be acquired at the lowest possible prices at the most convenient place and time.

These needs are to be met by the strategies of the global companies that design and later produce global products, using the achievements of interdisciplinary technologies, i.e. communication, automation, robotics, flexible manufacturing systems, material engineering (especially using nanomaterials), micro-electronics, information technology. Corporate companies reach their potential customers all over the world with information on their products or services, via global promotion actions; they build worldwide networks of production and distribution, as well as logistics systems allowing for these products to physically reach their consumers and users in every corner of the world.

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5 wyborcza.biz/biznes/1,101562,11527953,Rekordowa+sprzeda%c5%ba_Skody__12_+proc__wyzsza, 22.08.2013.  
3. **Theoretical Foundations of International Logistics**

If we treat logistics as a method of managing the flow of goods and information, then a very particular case of logistic management will be international logistics. If we consider the four areas of logistic management within the company: operational, financial (closely related to logistic costs) marketing and informational one, then such system of linked companies, located all over the world, where at least one of them is shared, will be called international logistics⁹.

**Operational** cooperation in international logistics is expressed by activities such as:

- implementation of the same (or similar) concepts (rules) of management by the participants, the companies being the supply chain links on the European scale (e.g. LM – Lean Management, AM- Agile Management, TBM – Time-Based Management);

- using one Shared Service Center, the objective of which will be to strengthen and facilitate functions in such areas as human resources management, IT support, logistics, operations between the customers and the supplier etc. (shared services make it possible to perform business processes in line with unified norms, with lowered risk and costs);

- building and use of partner undertakings with logistic companies, suppliers, recipients of the components and products;

- application of the same or similar concepts of inventory management (e.g. CMI, Co-Managed Inventory, CPFR – Collaborative Planning Forecasting and Replenishment, VMI – Vendor Managed Inventory);

- using the same or similar methods of goods flow management in companies that are participants of the supply chain on the European scale, and not only (e.g. Just-in-Time, Kanban).

- implementation of the latest transport technologies (e.g. transport navigation systems, warning systems, tracking systems, high-speed trains, trucks of maximum transport efficiency, that reach the lowest running costs in the industry with optimal performance of the vehicle, fuel-efficient engines, aerodynamic bodylines, modern and spacious inside of the vehicle, safe and economic aircraft);

- implementing the latest warehousing techniques – modern systems, machines, devices (e.g automatic identification, the “goods to man” systems, automatic monitoring, machine vision, automated high-bay warehouses, the WMS information systems- a programme for management of goods movement in warehouses, unmanned trolleys, robots, automatic machines);

- implementation of uniform measures to assess the logistic supply chain on its entire length;

- implementation of logistic packaging chains;

- construction of vast computer networks;

- implementation of modern communication systems, e.g. videoconferences, the Internet;

- standardization of production and inventory control methods and logistic processes;

- implementation of e-logistics (electronic stock exchange, electronic catalogues, freight exchange, electronic logistic platforms, corporation portals);

- standardization of operational costs balance in all supply chain participants;

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creating logistic centers;

Joint financial management related to international logistics costs, narrows down to monitoring and control:

- freezing of working capital in inventories – this constitutes the answer to a question of how much it costs all chain participants (companies) to freeze the capital in inventories, as opposed to the possibility to use it in any other, more efficient way – the cost of lost opportunities (only good production planning, based on the orders, or well-prepared forecasts, along with the right information exchange, ensures the minimization of stocks);

- the costs of physical flow in international logistic channels (including the costs of: depreciation of fixed assets involved in logistic activities, work, media and materials consumption, external transport services, taxes and transport insurance etc.);

- warehousing costs in international logistic channels (including costs of storage and manipulation);

- costs of stock depletion (including lost sales and delayed orders);

- costs of international logistic channel deficiencies and mistakes in customer service (these include penalties for the breach of supply conditions and all costs resulting from mistakes in service);

- the costs of information flow (the level of customer service is closely related to the quality of information along the entire depth and width of the international logistic channel);

- implementation of effective logistic activity crediting policy.

The identification of logistic costs for particular links of an international logistic channel is extremely troublesome and difficult. This is caused by the complexity of the problem resulting from the number of varying participants, different as regards their role and place within the channel. Defining and understanding all logistic costs of each link, especially when changes are introduced into one of them, requires carrying out a simulation and detailed system analysis within the entire international logistic channel. Helpful tools in defining logistic costs for all participants of logistic chains are:

- integrated management systems that support the ABC method – the balance of operational costs;

- an Excel spreadsheet that facilitates:
  - identification of all participants within both upper and lower part of the international logistic channel, along with the costs incurred by logistic operations;
  - carrying out simulations of changes and responses of all the links of the chain.

- services provided by specialized units (e.g. consulting companies, Accounting Service Centers –ASC, or Global Shared Services in Finance-Accounting).

The marketing cooperation in international logistics is about accomplishing tasks such as:

- creating the image of the company and brand consolidation for products and services, e.g. by participation in different kinds of rankings;

- realization of unanimous policy regarding the target strategy of logistic services via:

- working out a long-term program, among all participants, i.e. manufacturing, transport and distribution companies, that would indicate the areas for change which might be necessary in the long run;
- joint cost-reduction programs;
- monitoring of external factors that have impact on the price, i.e. customers, competition, distribution channel participants, regulatory, ethical and legal matters.
- using the so-called price positioning affecting the creation of added value for all participants in the supply chain;
- using expert advisory services;
- using integrated IT systems that support the decision making in the price policy area.
- training relevant staff that would be able to maintain the price regime of logistic products;
- finding and exploitation of market niches – among other ways, his may be done by a detailed analysis of:
  - substitution industries – in the broader meaning, the companies compete not only within their own field (e.g. transport industry), but also with the companies that provide substitutes, which would mean companies such as those belonging to the TFL sector (one needs to answer a question, whether there is a place for a new brand product);
  - strategic groups – the term “strategic group” describes a set of companies belonging to one sector and pursuing a similar strategy (e.g. logistic distribution centers for companies such as Ikea, Jeronimo Martins, Netto);
  - supply chain – in the sale of a product, it is crucial to define all supply chain participants until the moment of obtaining the materials, by all sub-contractors, to the final consumer (in this last case, one needs to answer the question, how deep the market is to be – the national, European or global one?);
  - complementary products and services – it is very rare that the products as such have a value to the customer, most often their price depends on considering the entire set of products and services complementary to one another (it is not enough to deliver a product, it needs to be installed, ran, serviced and withdrawn from exploitation),
  - functional and emotional preferences of the customers – in some industries the competition is based mainly on the price and the ratio of the price to the relevance of the product – such industries may be called oriented on the functional preferences of the customers,
  - time – in order to create a new market space, it is not enough to passively adjust the company to the appearing market trends, one needs to foresee the future needs of the customer and assess, how the change in needs would influence the perception of products; this is particularly visible in the IT sector,
- systematic study of transfers of shares in the competitive environment (here one cannot forget to create the legislative possibility of moving the stock between pools offered for private and institutional investors as well as between domestic and foreign investors);
- periodic analysis of the size and structure of demand for logistics – the following types of analyses are usually carried out:
  - market absorption;
  - segmentation and selectiveness;
- market capacity;
- market development trends, with particular attention paid to e-commerce,
- sustainability and flexibility.

- the use of “mix” promotion strategy, depending on the phase of product lifecycle;
- marketing research on chosen European and non-European markets, which would inter alia answer the following questions:
  - how does the logistic potential shape on the new markets in the European region, including Middle-Eastern Europe?
  - how to build a comparative analysis of a logistic company and the products or services it provides on several markets?
  - how to find new channels and markets, including e-markets, for logistic services?
  - what is most crucial in my logistic service from the perspective of the international market customer, with particular focus on e-logistics?
  - what is the position of my product as compared to the competition in the logistics sector, what are its distinctive features, if any.

Cooperation regarding information sharing and exchange is particularly important in international logistic channels, where the links are logistic companies, of network or virtual type, or finally enterprises that own intelligent production systems, where a human is replaced by machine data processing (IT technologies of artificial intelligence). Cooperation in the field of information is related, among others, to the following:

- data exchange within all management functions (planning, organizing, motivating, controlling, decision-making and coordinating);
- creating one shared database within integrated management systems or in the Internet;
- data exchange in key functional areas of the company (e.g. sales, distribution, technical preparation of production, production planning and management, production and assembly of products; supplies, storage; tool and repair management);
- using professional logistics platforms;
- making use of the global standards;
- the use of the Global Data Synchronization Network (GDSN), i.e. compatible electronic catalogues storing data on products and producers, enabling secure and continuous data synchronization; this way all trading partners have consistent data in their systems, regarding a specific unit at the same time;
- exchange of information via EDI.

4. **Networks and channels of international logistics**

International logistics consists of two basic elements\(^{10}\):

\(^{10}\) Cf. E. Golembśka (ed.), Kompendium wiedzy o logistyce, PWN, Warsaw, Poznan 2001, p. 128.
- configuration of the international logistic network (often referred to as international logistic systems);
- supply chains in international dimension, the so-called international logistics channels.
- The international logistics network configuration is a human-created system of basic, permanently located ones:
  - routes for all modes of transport (i.e. road, rail, air, inland waterway and sea transport);
  - modal points\textsuperscript{11} of the logistic network, oftentimes called transport points (e.g. warehouses, independent container points, airports, seaports, logistic centres, etc.);
  - ancillary equipment that facilitates the process of servicing roads and transport points;
  - transmission media, through which the logistic points flow to the sources of raw materials extraction, to the place where these products are supplied.

This system can be seen as a closed set, with the following formula:

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\text{IWC} = D \cap P \cap U \cap M \cap R
\]

where IWC is net international work configuration.

- D - roads;
- P - modal points;
- U - ancillary equipment;
- M - transmission media;
- R - interrelations between elements.

The configuration of an international logistic network is subject to constant change, which is evoked, first of all, by modernization and development of the transport and logistics infrastructure.

5. **INTERNATIONAL LOGISTIC CHANNEL MEANS:**

- optimal routes created purposefully and in a systematic way, most often within the confines of the already-existing international logistic networks (though in emergency logistics networks may be created individually, e.g. temporary landing sites or warehouses) to the recipient, along with accompanying information;
- the physical network which begins with the supplier and ends with the ultimate client and embraces aspects related to product development, purchase, manufacturing, physical distribution, after-sale service and the circulation of information.

The analysis of the professional literature content and the presented definitions, from the perspective of the product/service added value, makes it justified to form a range of judgments and demands\textsuperscript{12}:

**Firstly:** in international logistic channels the subjects are linked by the physical movement of goods and sending information. A good example may be the Singer sewing machine. The basic components of these

\textsuperscript{11} The name of modal (most likely) points of the logistics network refers to all places of stopovers for the products, i.e. warehouses, outlets and transport nodes and factories, distribution networks, etc.

\textsuperscript{12} Conclusions are based on source materials listed above.
machines are produced on three continents: the housing - in the US, the drive shafts - in Italy, and the motors - in Brazil. The final product is assembled in Taiwan, while the customers are spread all over the world. The dispatch of supply, manufacturing and distribution-related functions between subjects located in various parts of the world is a huge challenge for logistics, which needs to unite and integrate the system.\(^{13}\)

**Secondly.** International logistic channels a network of companies established to develop a new product, exchange resources, gain advantages through its size, reduce costs, increase a competitive advantage etc. They are divided into horizontal and vertical ones. The former ones are networks established by manufactures of similar or same goods. The latter are represented by a set of companies connected with one another in a ‘supplier – receiver’ relationship.

**Thirdly** – the subject structure of international logistic channels is created by mining companies, suppliers of materials and components, manufacturers, service providers, transport companies, warehouses and logistics centers, distributors and all the relationships between them.

**Fourthly** - an international logistic channel is a quick, flexible and interconnected system driven by the mechanism of the customers’ choice, aiming to achieve a high level of customer satisfaction, as well as, to gain the highest possible profit by the companies within this channel.

**Fifthly** - the international logistic channel can be described by means of the following characteristics: the process (the subject of the flow), the structure (the entity structure), and the objectives (the scope of action and the areas of cooperation of participating entities).

**Sixthly** – the range of international logistics channel consists of raw materials, auxiliary materials and cooperating elements, purchased on the supply market according to the need, passed on to the production process and finished products submitted for sale and delivered to the customer.\(^{14}\)

**Seventhly** - depending on the configuration of the international logistic channel, its links may consist of different kinds of mining, processing, service and trading companies. Their position within the channel results from the division of work in the next stages of production and sales of goods. Because of their role as senders and receivers of loads, as well as, the accompanying information and finance streams, their basic role in the functioning of the international logistic channel is unquestionable. The service functions of a company are also important links in supply chains. These may include, among others: \(^{15}\)

- logistics, transport and shipping companies;
- information brokerage companies;
- reprocessing and waste storage plants.

The international logistic channels, just like all other logistics systems relate to ensuring the usability and utility of time availability of goods and services. Their incorrect configuration leads to waste, generates unnecessary costs and lowers the level of customer service.

Continuous improvement of the configuration of international logistics channel is imposed by activeness of the competition, as well as by:

- the changing demands of customers in relation to logistics services (e.g. individual client, on-time delivery of production-related cargo, either JiT or 7R\(^{16}\) – related, a wide range of after-sales service, including the withdrawal of products from operation);

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16 7W – right product, right quantity, right condition, right place, right time, right customer, right price.
the emergence of new e-economy relations (B2B, B2C, C2C, B2A, where B – business company C - retail customers, A - commercial administration authorities);

- demand for new types of services;

- adaptation to the requirements of information technology (e.g. the Internet, the Intranet, Internet portals, information systems supporting logistics, telematics, automatic identification);

- adjustment to production systems based on flexible production systems and Intelligent Manufacturing Systems of the future (IMS);

- changes in the supply and sales markets, such as the emergence of a new form that is e-commerce and the expansion of Chinese products and services;

- high cost of logistics activity caused e.g. by rising fuel prices, fixed and variable charges, the hire logistics infrastructure in attractive locations.

In practice, we distinguish the following types of international logistics channels:

- discontinuous;

- continuous;

- synchronous.

The type of the international logistic channel stems from the character of logistics tasks which are closely related to:

- type of production (individual, serial, mass);

- form of production (rhythmical, non-rhythmical);

- organization of production (group production type – technological specialisation, socket and linear type – subject-related specialisation);

- the degree of IT systems use.

If we deal with the conventional production systems and individual, small-lot, non-rhythmical production, then, depending on the advancement of IT systems into the manufacturing process, we have discontinuous and continuous channels. A high changeability of assortment or manufacturing programmers, along with irregularity of inflow of orders cause difficulties in developing schedules for production orders.

In case of rhythmical, mass production, coupled with a modern flexible manufacturing system (ESP) and computer-integrated manufacturing, the flow of goods and services is carried out in the framework of the continuous and synchronous channels (the latter are dominant). The presented production systems and channels are characterized by:

- the possibility to create the so-called master schedules;

- the stabilized volume of on-going production;

- minimal inter-operational resources;

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- multi-assortment potential;
- the ability to adapt to manufacturing of new products with in any order of their manufacture;
- responsiveness to change, i.e., the delivery time is calculated from the moment of its foundation until his execution.

The configurations of international logistic channels are created within the confines of different relationships and economic dependencies, within integrative and partnership undertakings. In practice, it they are realized via:

- fusions (two companies voluntarily move their assets to a new entity);
- takeovers (agreed and hostile);
- strategic alliances;
- partnership undertakings – they are voluntary, varied in form, from highly formalized long-term agreements to short-term ones.

Summary

Contemporary international logistics has put an end to competition between individual business entities; instead, entire supply chains compete with one another, the links of which are mining, transportation, manufacturing, distribution and utilization companies. The data exchange between businesses belonging to one supply chain is what triggers the rapid creation of logistic channels, which include network and virtual companies.

Globalization and international logistics

Abstract

The subject of the article is globalization and its impact on the conditions of logistics functioning and development in the international scale. The presented theoretical background reflects the very essence of international logistics, its function and the roles of networks and channels created within its structures.

6. Literatura


[12] wyborcza.biz/biznes/1,101562,11527953,Rekordowa_sprzedaz_Skody__12_proc__wyzsza, 22.08.2013.