



DIGITIZATION OF SERVICES IN LOGISTICS SUPPLY CHAINS

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Abstract: Today, in the logistics sector, the world is faced with problems such as disruptions in supply chains, traffic jams in ports, the growth of product stocks, the low level of digitization of operations in logistics chains, and the lack of qualified personnel. The solution to these problems is largely related to the digitization of services in supply chains. Based on this, this article covers the issue of digitalization of logistics services in logistics supply chains.

Key words: logistics, supply chains, supply chain links, logistics functions and operations, material flow, supply chains, logistics management.

Introduction

Today, logistics and supply chain are becoming more and more important for all business entities to have competitive advantages, to meet the needs of customers on time, with high service. The past three years have seen disruptions in long-standing logistics supply chains around the world. In such conditions, all logistics companies are considering the possibilities of finding new solutions and creating new logistics chains.

Uzbekistan is one of the countries that exports its goods to more than 100 countries and is developing logistics corridors. According to the 36th goal of the Development Strategy of New Uzbekistan for the years 2022-2026: To develop a unified transport system that connects all types of transport, to create an opportunity to reach and return to the destination on the basis of daily transport between large cities. Development of the market and infrastructure of transport and logistics services, raising the level of electrification of the railway infrastructure to 60% and rapid development of the road network, "green corridors" for foreign trade in the field of transport and expansion of transit opportunities and the volume of transit cargo to 15 million tons such as delivery is defined.

Digitization of services in the newly established logistics corridors and supply chains is the most optimal means of increasing the development and efficiency of this sector.

Analysis of literature on the topic

In the early 1980s, the term "Supply Chain Management" began to be used in the United States. The first use of this term was proposed by the American designers K.Oliver and M.Webber to be considered within the framework of an integrated strategy by calling the supply of primary raw materials to production enterprises and the management of supply chains of finished products from production enterprises to the final consumer. [8]. K. Oliver and M. Webber formed the concept of business logistics as an integral tool of business management in the organization of material flow, and also showed that there are significant fundamental differences in the functions of marketing and logistics in distribution channels [8].

Langley C.J. researched a wide range of activities related to the effective organization of material flow movement in the supply of raw materials in the product production line and conducted relevant research on the formation of elements of supply chains [13].

Bowersox D.J., Closs D.D., Hedfeich O.K. In his extensive research on logistics management, he touched on the problems of stock management, stock organization and management at each link of the logistics chain [1].

The role of stock in product supply chains, including the delivery of primary raw materials to production enterprises, the principles of stock creation, adaptation to supply chains in stock management, and issues of integration and coordination of logistics activities into key solutions S.James, F.Donald, D. Woodlar studied in his research [7].

In recent years, specialists from Uzbekistan have been conducting a number of scientific research works on logistics. In particular, N.Babayev is conducting a number of studies in the logistics system on stock management, effective management of material flow [2], planning of logistics service [3]. Also, D.H.Kholmamatov is conducting scientific research on the issues of organizing marketing logistics [9,10], providing logistics services to customers, increasing the efficiency of logistics services [11], and developing logistics in trade[20].

Research methodology

When writing the article, an attempt was made to reveal the problem by using the methods of analysis and synthesis in the analysis of the composition of logistics operations performed in supply chains, information and financial flows. The study also used monographic observation, empirical data analysis, and abstract methods. The necessary information for the research was mainly obtained from foreign literature, statistical and legal databases.

Analysis and results

Logistics supply chains play a key role in logistics activities. The concepts of supply chain, supply chain and logistics system are widely used in foreign economic literature. Supply chain is a system connecting all necessary processes between production and delivery of products to the final consumer in modern business.

Elements of the logistics supply chain include transport companies, warehouses, wholesale and retail trade companies, loading and unloading companies. It is necessary to look at the elements of the logistics supply chain separately at the micro and macro levels. If the relationship between elements is reflected in the form of contracts at the macro level, it is in the form of internal production relations (order, decision, task) at the micro level.

Logistics supply chain is an economic-organizational object performing a certain functional task, which performs its local function in accordance with the logistic operations or functions assigned to it within the framework of this system.

At the macro level, the elements of the logistics supply chain are considered to be various consumer and supplier enterprises, as well as various tools that make up the supply chain. At the macro level, the following links are considered as elements:

procurement link (department) - this link ensures the entry of the material flow into the logistics chain;

warehouse link - temporarily stores goods and material resources;

transport link - ensures the delivery of goods and material resources;

production link - consumes the material flow and produces finished goods;

sales link - ensures the exit of the material flow from the logistics system.



Figure 1 shows the view of a simple logistics supply chain, which includes the same product-producing firm, consumer and one intermediary, and only material flows are considered.

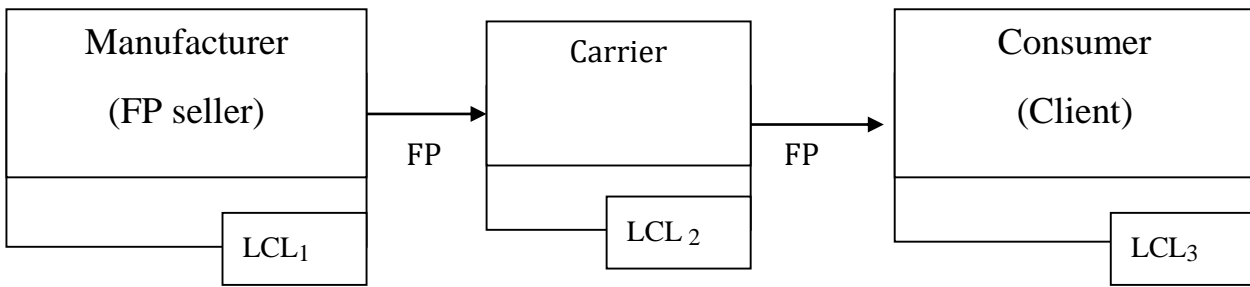


Figure 1. Simple logistics supply chain.

In Figure 1, the following designations were used:

→ material flow;

FP - finished product;

— LSC1, LSC3 logistic chain links.

In essence, this supply chain is a distribution chain of the finished product of a manufacturing company. In this case, the seller, the carrier and the buyer form mutually connected links of the supply chain. According to this supply chain, during the delivery of goods to the buyer, receiving and processing the order, preparing, covering, packing, loading, transporting, unloading the finished goods to the buyer, preparing the goods in sufficient quantity for transportation, issuing the goods transport documents, payment Logistical operations such as implementation, transfer of ownership of the finished product to the buyer are performed.

The described logistic operations are in various options, i.e.:

a) only the seller; b) only an intermediary; c) only by the buyer; g) can be performed with the participation of all three joints, d) with the participation of different combinations of two joints.

Even in the normal logistics supply chain, as already indicated above, the existence of a multi-option situation puts before the logistics management the problem of choosing the best option.

To solve the problem of choosing a logistics supply chain, the logistics manager compares the tariffs and prices of logistics operations performed at all links participating in the supply chain according to the criterion of minimizing total costs, and determines the optimal options. Secondly, if there are several transport companies operating in the market of transport services, it is required to compare the tariffs of different transport companies for transportation, forwarding and other operations and choose a transport company. Thirdly, in order to meet all the customer's requirements for service, when choosing a carrier, it is necessary to pay attention to requirements such as timely delivery of the cargo, preservation of its integrity, and taking into account quality delivery.

These cases prove that the issues that logistics management should solve are multifactorial and optimization issues.

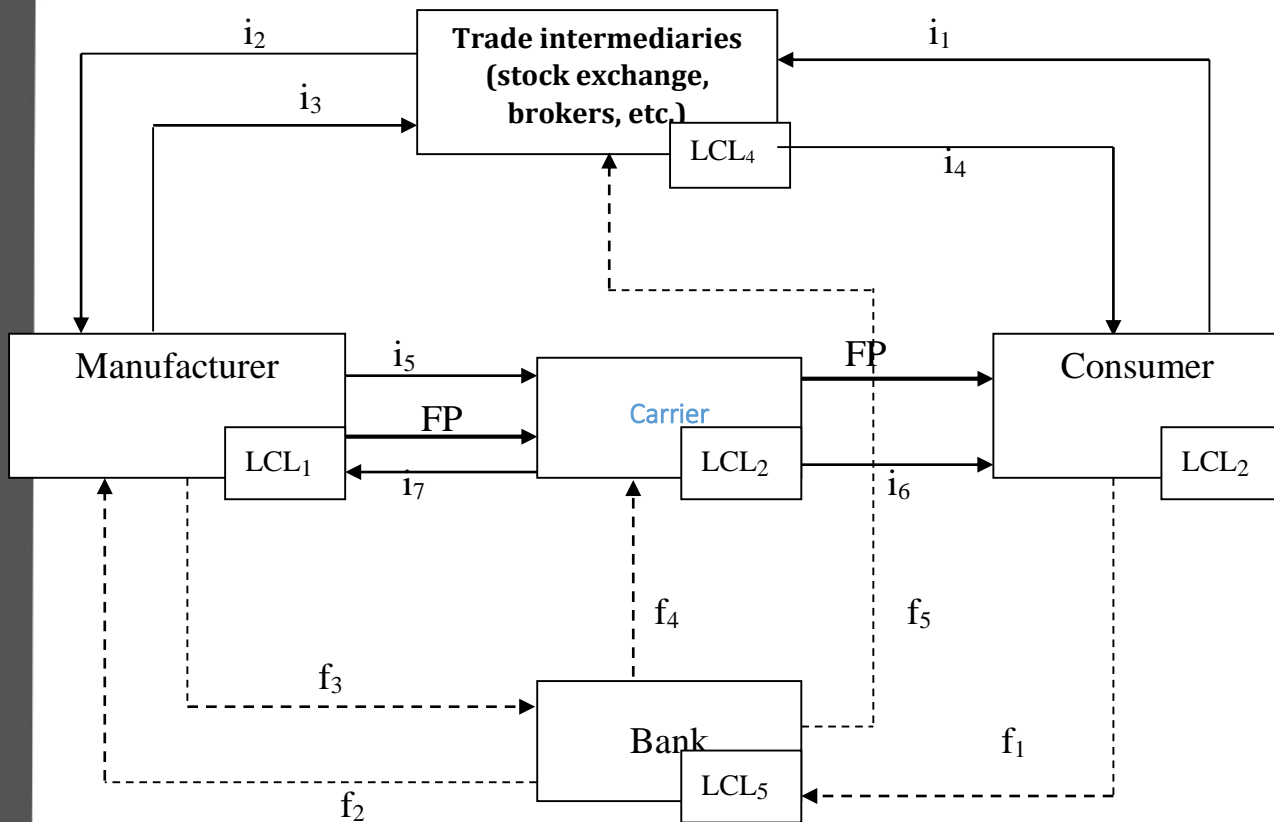


Figure 2. Logistics supply chain for material, information and financial flows.

Figure 2 uses the following designations:

- material flow;
- information flow;
- > financial flow;
- LSC₁, LSC₅ - logistic chain links;
- i_1, i_7 - information flows;
- f_1, f_5 - financial flows;
- FP - finished products.

In this supply chain, several logistic chains can be distinguished, where each chain corresponds to a specific logistic function with material, information and financial flows. This situation is reflected in Table 1.



Table 1

Logistical operations performed on information and financial flows

Information flows		Financial flows	
Symbol	Logistics operations	Symbol	Logistics operations
i ₁	Ordering finished products	f ₁	Payment of the cost of goods by the buyer
i ₂	Processing the order and sending it to the manufacturer	f ₂	Receiving payment for the goods from the buyer
i ₃	Issuing a bill for goods for sale	f ₃	Payment for transport, bank and exchange services by the manufacturer or buyer
i ₄	Send the bill to the buyer for payment	f ₄	Carrier charges for transportation
i ₅	Registration of cargo documents and delivery to the carrier	f ₅	Exchange Service Charges
i ₆	Acceptance and registration of shipping documents by the buyer		
i ₇	Submitting a shipping bill to the manufacturer or buyer		

The logistics seen above is a typical example of a manufacturing firm operating exclusively in the distribution service of a supply chain. In the real sector of the economy, it is necessary to design and build sufficiently complex logistics supply chains. The importance of rational organization of flow processes and their optimal management in large and complex systems is increasing more and more. Logistic functions and their corresponding chains are presented in Table 2.

Table 2

Logistics functions and their corresponding chains

Logistics chain	Complex logistic function
LCL ₃ i ₁ LCL ₄ i ₂ LCL ₁	Order processing
LCL ₁ i ₅ LCL ₂ a ₆ LCL ₃	Freight forwarding
LCL ₃ f ₁ LCL ₅ f ₂ LCL ₁	Transfer of property ownership and payment for goods
LCL ₁ f ₃ LCL ₅ f ₄ LCL ₂	Payment for transport service by the producer.
LCL ₁ f ₃ LCL ₅ f ₅ LCL ₄	Payment for exchange service by the producer.
LCL ₃ f ₁ LCL ₅ f ₅ LCL ₄	Payment for exchange service by the buyer
LCL ₃ f ₁ LCL ₅ f ₄ LCL ₂	Payment for transportation service by the buyer
LCL ₁ ^{FP} LCL ₂ ^{FP} LCL ₃	Material flow



Taking into account the diversity of the assortment of goods and the nomenclature of raw materials and material resources used for them in modern production, the branching of supply, production and distribution processes, as well as the participation of many logistic intermediaries in service processes, such systems are extremely complex organizational it is not difficult to understand that it will be structural. That is why today all operations, functions, i.e. services performed in global logistics supply chains are being digitized.

Currently, digital technologies are an absolute global trend for the development of all areas of human activity. The main directions of development of digital technologies can be distinguished:

big data;

Blockchain;

Cloud solutions;

Internet of things, IoT;

Robotics;

Driveless;

Artificial Intelligence, AI Machine learning;

Virtual Reality, VR / Augmented Reality, AR;

3D printing and other technologies.

Many companies have adopted a digital business transformation strategy. All logistics companies are digitizing logistics operations, which are primarily performed in supply chains. Communications, performed functions and operations in logistics chains are being completely digitized today.

The main tasks of digitalization of logistics supply chains are as follows:

Minimize logistics chain disruptions;

Preventing traffic jams in ports and timely processing of orders;

Optimization of costs and working capital;

Improving the efficiency of trade channels;

Increase in sales margin;

Price optimization;

Reducing industrial risks;

Creating new business models;

Development of new products and services for market needs.

It is necessary to create a digital competence center for digitalization of logistics supply chains. It includes:

digital transformation offices;

block advanced analytics;

digitization block of processes;

block on industry 4.0;

digital innovation lab;

complex numerical models.

Conclusion

In modern logistics, the supply chain is viewed as a number of interrelated parts to produce and deliver products to customers with maximum speed and efficiency. At the same time, many specialized software solutions for supply chain management have appeared on the

market today, which allow companies operating in various business areas to automate most of the processes, ensure their transparency and efficiency. Based on the collected data, supply chain management systems help to improve business processes and ensure their efficiency and productivity as much as possible in order to gain competitive advantages in the market.

A supply chain is a system of movement of material goods resources from the manufacturer or supplier to the final customer, with coordinated activities to get the product safely and without delay at the lowest possible cost. It is the network between the manufacturer, the carrier and the customer. The main function includes procurement of raw materials, selection of mode of transportation, forecasting of product demand, planning of product sales and distribution, inventory creation, route mapping, on-time delivery and most importantly customer service. .

The main activities of the supply chain are:

1. Production planning.
2. Purchase.
- 3 Material management.
- 4 Transportation.
- 5 Customer service.
- 6 Sales/demand forecasting.

Supply chain digitization is the process of upgrading an analog supply chain process to an automated and digitized process by implementing modern technology and software.

The main tools used to digitize the supply chain industry are artificial intelligence, the Internet of Things, blockchain, cloud computing, machine learning, GPS, electronic data, robotics and the most advanced - the use of drones..

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