

CONSIDERATIONS REGARDING THE INFLUENCE OF TECHNOLOGY ON LOGISTICS MANAGEMENT

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Abstract

Logistics is one of the industries that has undergone strong evolution in recent years. The pandemic, the change of technological flows, the increase of production, the special evolution of e-commerce has determined the profound transformation of logistics. The world is changing, and automation is being found in more and more aspects of everyday life. Every year, specialized software programs and applications are launched, and the cost of equipment is constantly reduced, as new technologies appear. So, the role of the logistics system in the distribution activity must be analyzed in the context of the dynamism that characterizes all aspects of contemporary society.

Keywords: logistics, logistics management, logistics strategy

JEL Classification: D30

1. Literature review

In a first sense, logistics is the set of methods and techniques that aim to regulate, in an optimal way, in time and space, the flows of material goods and services, and in some cases even people.

K.N. Gourdin considers logistics itself as a complex process of operational activities to ensure customer satisfaction²⁰. I. Patriche, appreciates that the logistics refers - in a general vision, as a whole - to the systematic management of the various activities that are necessary to move the products from the place of production to the customer²¹.

Wherever the analysis is located within the distribution of goods, upstream of the production process (supply of raw materials, materials, equipment, etc.) or downstream (sale of products), logistics will face needs, requirements, satisfactions or customer dissatisfaction, be they producers or final consumers.

In this sense, we can approach logistics from the perspective of the relevant, major stages it goes through: supply logistics, production logistics, sales logistics.

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²⁰ K.N. Gourdin: *Global Logistics Management: a competitive Advantage for the 21th Century*, Blackwell Publishing, Molden, 2006, p. 2

²¹ I. Patriche: *Canale de distribuție și logistică*, Editura Pro Universitaria, București, 2006, p. 108

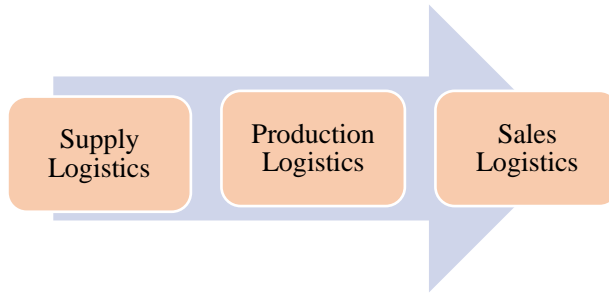


Fig. no. 1: Procedural approach to logistics

Thus, the managers of the different organizations must determine, first of all, the logistical strategies that the respective organization will be able to develop and implement, within the distribution circuits for which it has opted. Of course, the logistics strategies must be in line with the overall strategy of the organization, the distribution strategy and the marketing strategy.

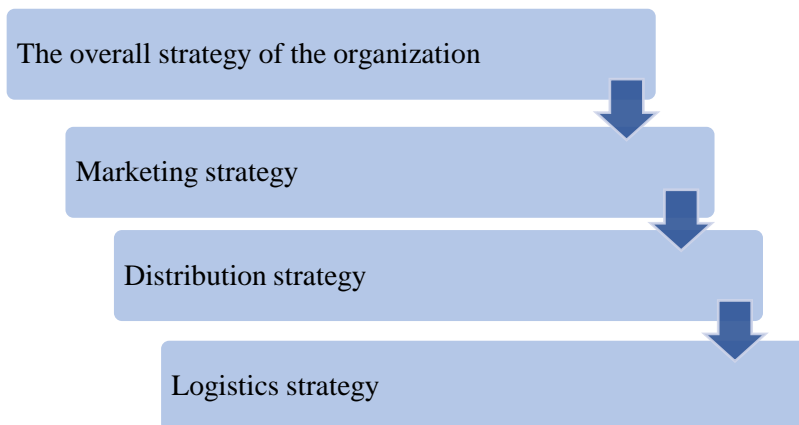


Fig. no. 2: The place of the logistics strategy within the global strategy of the organization

M.E. Porter, referring to the logistics system, states that it, through its content, aims to, through the organization, synchronization and operationalization of the various activities that make up its content, to provide the optimal ways to efficiently capitalize on distribution flows. of products. The conglomerate of primary activities²², which underlie the distribution system, are also included - procedurally - in the production, product delivery and marketing systems. The ensemble of the distribution process and the three systems, correlated with inputs, technologies, human resources, and general infrastructure, needs to be supported by primary activities.

²² M. E. Porter: *The Competitive Advantage of Nations*, The Free Press, New York, 1990, p. 40

In view of all these issues, the following can be discussed:

- ▶ for organizations with high flow in the production process, materials and logistics management can be synonymous;
- ▶ for organizations that focus on post-production issues and the development of after-sales and support services, logistics is focused on the flow of finished goods, from the end of the production line to the customer;
- ▶ some organizations see in logistics a twinning between materials management and distribution policy.

The role of the logistics system in the distribution activity must be analyzed in the context of the dynamism that characterizes all aspects of contemporary society. This is because, in previous years, this was a competitive advantage, today it is a mandatory minimum condition or a standard of acceptance. The role of the logistics system cannot be addressed without changing the business environment. We appreciate that, in the international business environment, the changes are dramatic, a phenomenon that has left its mark on the role of the logistics system, involving that system in the global operations of organizations.

2. Logistics and technology present and perspective

The world is changing at a fast pace, and automation is being found in more and more aspects of everyday life. Every year, specialized software programs and applications are launched, and the cost of equipment is constantly reduced, as new technologies appear. Among the many areas marked by automation are logistics, a sector in which reaction time and speed are crucial in most processes, and human error can compromise the efficiency and profitability of operations - implicitly, business longevity.

An uplifting example of the advancement of technology in the field of logistics automation is the launch of the Yara Birkeland, a fully automated cargo ship. It is expected that it will sail alone and can be controlled remotely, as it will travel a short, predetermined route of several tens of kilometers. Jon Sletten, director of the Porsgrunn plant in Norway, where the Yara Birkeland ship was built, said it would sail to container ports along the coast and back, replacing about 40,000 truckloads a year. The hull of the ship Yara Birkeland was launched at sea in Romania in February 2020 and arrived at the Norwegian shipyard three months later, in May 2020, where it was equipped with various control and navigation systems and subsequently tested. The COVID-19 pandemic, along with logistical challenges, delayed its official launch.

Another example of this is Amazon, the world's largest retailer, which uses more than 80,000 robots in its warehouses.

Vehicle monitoring systems, including network coordination, and drone deliveries complete the logistics solutions of the future. It is estimated that new technologies will streamline the circulation of consumer goods globally, improving delivery times and safety conditions. In

the next 5-10 years, the field of freight transport will change dramatically, due to globalization, the influence of the Internet and the pace of automation²³.

3D printing could also shorten the supply chain, reducing delivery costs. The development of M2M (machine to machine) communication will favor the automation of warehouse logistics processes, and delivery services will become more punctual and more secure due to the widespread use of driver safety support systems.

Robots (collaborative robots) are revolutionizing the entire economy. In the coming years, the value of this market will be estimated at \$ 5.6 billion, while in 2030 it will reach the ceiling of \$ 12 billion. Most of these devices are currently in the electronics and automotive industries, but things are changing. There is a good chance that by the end of 2023, the logistics industry will dethrone the car industry and become the second largest sector in the world to use robots - said Tomasz Sączek, an expert in supply chains²⁴.

Interest in robots and robots is growing. Collaborative robots are currently used in Poland by the Amazon subsidiary, as well as by Unilever and Modelez. These devices mainly deal with palletizing and "supporting storage processes".

Collaborative robots can work with people, temporarily replacing absent employees. They carry out their activities in places where work is automatic, consisting of repetitive activities.

Gradually the human work system will change, including in terms of logistics. The person will become a value-added employee, who analyzes the data and makes decisions. In this context, the problem is to collaborate with a robot and a fellow cobot; training courses on these issues may arise.

In logistics, the most important thing is for the product to get where it needs to go, when it needs to, and the time to place orders is essential. Augmented reality can make receiving or picking processes much faster. DHL has successfully implemented in one of its warehouses in the Netherlands, a pilot project to test smart glasses and augmented reality. The technology was used to test "pick-by-vision" operations. With the help of smart glasses and augmented reality, the operator is guided into the warehouse by displaying the picking list on the lens of the glasses. Another benefit of this technology is the fact that the glasses also scan the barcodes, the operator having both hands free to handle the goods more accurately. The picking process becomes much faster. The pilot project demonstrated a 25% increase in operator efficiency.

Logistics companies were among the first to use mobile devices as a means of managing and monitoring their processes. The hand-held devices that pickers or carriers use have brought the first benefits in automating logistics processes. Today, we can connect not only hand-held devices or vehicles, but also containers, forklifts, mobile cranes, conveyor belts, carousels, automatic storage and retrieval systems, sensors at the entrance-exit gates. A

²³ <https://www.ziuacargo.ro/stiri/logistica-stiri/viitorul-logisticii-automatizarea-inseamna-mai-rapid-si-mai-sigur>

²⁴ <https://trans.info/ro/serviciile-digitale-vor-economisi-timp-si-bani-pentru-transportatori>

connected pallet can, for example, provide information about its condition, approved shipping conditions or destination, and a truck can intelligently predict its own maintenance needs. IoT can also be used successfully in the first phase of inventory, making it easier for employees and shortening inventory time²⁵.

Summarizing the presented, we can say that the challenges of the logistics of the future will be:







The challenges of the logistics of the future:	 expansion of automated means of transport
	 drone deliveries
	 expanding the use of cobots
	 communication development M2M
	 the extend of the use of smart glasses
	 augmented reality

Fig. no. 3: the challenges of the logistics of the future

3. Conclusions

The role of logistics systems in distribution circuits will increase, diversifying both the logistics supports and the ways of intervention, guidance, tracking and control. In this regard, some more important conclusions can be drawn:

- ♣ reorientation of the managerial systems;
- ♣ rethinking, geographical reorientation and networking of supply systems;
- ♣ improving the assortment management and restructuring the ways of forming batches of goods;
- ♣ development and modernization of communication channels;
- ♣ Improving the banking system.

²⁵ www.deloitte.ro, Ciprian Gavrilu, Partener Servicii Fiscale si Juridice, Deloitte România

- ♣ Deadline and relocation of important production points - factories or production departments - depending on the geographical concentration of consumer centers, legislative issues etc.;
- ♣ reorientation of the deposit network;
- ♣ the establishment and development of large integrated distribution organizations that address directly to final consumers;
- ♣ promoting new ways of omnichannel communication with the public and, in general, of continuous improvement of the trade-consumer relations system.

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