

ANALYSIS OF THE CURRENT STATE TO DETERMINE THE RATIONAL TECHNOLOGY OF ORDER SERVICE OF ELEVATOR SYSTEMS LLC

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In the course of production development, taking into account the changing conditions in economic relations with customers, all manufacturing and trading companies face the need to improve the efficiency of the mutual functioning of their structural units. These companies generally set two production goals: to increase the efficiency of using their existing resources of the appropriate type and to adapt to new external conditions in a constantly changing world. One of the problems of achieving these goals is the task of rational logistics service of orders [1,2].

The transport (logistics) service system is a process in which semi-finished goods, work in progress, products and related information move in accordance with the requirements of the order within the customisation service model. The customised service supply chain is different from the traditional manufacturing industry, with no inventory backlog [3,4].

Order allocation in a manufacturing company is to find a rational list of appropriate services for a particular order [5,6]. Logistics service providers provide a variety of services for manufacturers and their customers, but there is no standard open order allocation mechanism that would help the logistics service provider identify the appropriate service from a large number of options for its implementation - for greater reliability of the system [7].

Elevator Systems LLC produces high-tech equipment to solve specific customer problems in the operation of warehouse and elevator systems, as well as spare parts for equipment: belt conveyors; chain conveyors; bucket elevators; screw conveyors; gravity equipment; drive and tension drums of elevators, with and without lining; belts and buckets; drive and tension stations for conveyors, as well as chain and scrapers [8]. The equipment is grouped to organise production at elevators (farm, linear, port) and factories (feed, seed, oil extraction). In the period from 2017 to 2021, the company saw an increase in orders both in Ukraine and from abroad (the EU, Latin America, and Asia) (Fig. 1).

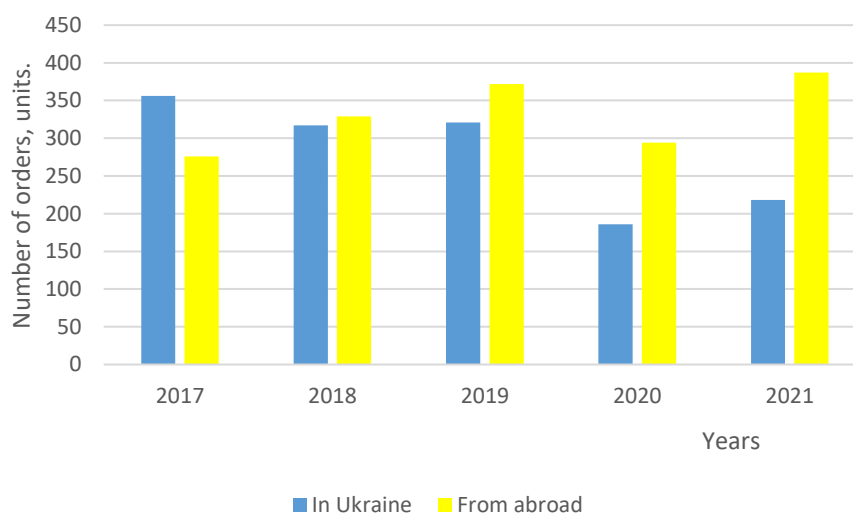


Fig.1. Order volumes at Elevator Systems for the period from 2017 to 2021

In recent years, manufacturing companies have begun to pay special attention to their supply chains in order to improve their sustainability performance in order to meet customer demands and comply with environmental legislation [9]. Thus, sustainability awareness has become an important issue in supply chain management, and companies prefer to work with other companies that are engaged in this topic. The study [9] presents a framework for solving the problem of sustainable selection of a logistics service provider and distribution of orders.

Global economic integration and the rapid development of e-commerce have created an unprecedentedly huge market for the logistics industry. More and more logistics service integrators prefer to outsource their logistics orders to functional logistics service providers, thereby forming a logistics supply chain to better meet customer needs. Reasonable distribution of orders is a key indicator for maintaining relationships during supply chain collaboration [10, 11, 12].

Faced with fierce competition in order distribution services, logistics service providers seek to win more orders and try to gain a market advantage by investing in various demand-enhancing innovation efforts (such as improving service processes, optimising the logistics network, investing in logistics technology, etc.). Many researchers point out that the innovative efforts of service providers invested in are vital to their innovation capabilities, which can help them compete effectively. Executives of a leading Danish logistics company emphasise the need to continuously innovate and focus on increasing value for customers and stakeholders [13, 14].

Order picking is the most costly activity in a manufacturing company's warehouse because it is labour-intensive and repetitive [15]. However, research on order picking has mainly focused on either order batching or picker routing, both of which are quite complex problems. Thus, taking into account the peculiarities of existing logistics centres of manufacturing companies, namely that the products and goods ordered are few but diverse, the vehicle configuration in logistics centres is limited, and batch sizes have upper limits of carrying capacity. Study [15] proposes an efficient hybrid algorithm for solving the problem, batch picking and routing mechanisms to determine the batch size, distribution of orders in the batch, and the distance of movement.

In recent years, the scientific community and many technology companies have come up with excellent innovations aimed at managing the supply chains of process equipment and spare parts [16]. A key point for management is the logistics strategy, especially one that optimises order picking systems within the warehouses of manufacturing companies. In logistics, order picking refers to the process of planning, receiving, and transporting a set of inventory items from their locations in the warehouse to the receiving and delivery area for inspection. The shipments are packed and sent out to fulfil the orders of the respective customers, both internal and external [16]. The main issue with picking is that due to the intensive and repetitive work of pickers, it is the most difficult, complex activity to manage and the one that has the greatest impact on costs (50-70%) [16].

As the level of logistics services has increased and industry competition has intensified, more and more logistics companies have begun to implement the mode of mass customisation of logistics services [17]. The key challenge in achieving mass customisation of logistics services is to provide individual and personalised logistics services to customers to the greatest extent possible at the lowest cost. Since one logistics service integrator cannot meet all customer needs, many others prefer to outsource some logistics tasks to specialised functional logistics service providers [17].

The study found that Elevator Systems manufactures high-tech equipment to solve specific customer problems in the operation of warehouse and elevator systems, as well as spare parts for equipment, and independently organises the process of supplying products to customers.

The main challenges faced by the company in the transport services market are to reduce service time, increase the efficiency of service provision and meet the requirements for risk-free and regular transportation. Therefore, there is a need to develop new approaches aimed at the rational organisation of transport services for orders through the efficient use of existing resources and optimisation of operating parameters.

The analysis of developments in theoretical studies has shown that the introduction of innovative technologies and modern solutions in solving the problems of building a rational transport service system by logistics companies requires multi-stage complex solutions and financial investments. The main emphasis is placed on finding new opportunities in the field of external management and developing various service options. In the existing developments of the theoretical framework for the implementation of modern technologies in the work of manufacturing and logistics companies, foreign scientists pay considerable attention to the development of multichannel management and the construction of reliable order service systems.

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