- enables customers to evaluate products, services, suppliers, and carriers before making a purchase decision;

- provides customers with the information they need about the origin of the goods and the freight route;

- reduces the risk of fraud or counterfeit goods;

- simplifies the exchange of goods and payment systems. [3]

The integration of blockchain technology in transport logistics helps to improve security, transparency and efficiency in cargo management, as well as helps to solve the classic problems of interaction and trust between participants in the supply chain.

In a world where technology is rapidly evolving, the use of innovative supply chain solutions is becoming a key factor in the success of businesses. In this article, we have reviewed a variety of technological tools that simplify logistics processes, ensure accurate inventory management and provide effective demand monitoring. The use of these solutions allows businesses to improve efficiency, reduce costs and increase customer satisfaction. However, it is important to remember that success also depends on the proper integration of technology with business processes and continuous improvement of management strategies.

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MULTIMODAL TRANSPORT HUBS IN UKRAINE

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The world's population is growing every day, and with it the production of goods for a comfortable life. Transport hubs are associated with the transportation of raw materials to processing sites, their movement in the production process and the transportation of finished products to places of consumption. “Multimodal nodes, as constituent elements of a particular multimodal transport system, differ significantly in their importance, level of cargo flow concentration and area of influence. This distribution depends on the location of the hub, its location in the zone of influence of transport corridors, and the geopolitical position of not only the hub but also the territory where it is located”[1]. The efficiency of transport hubs affects the effectiveness of multimodal freight transport.

“The development of the economy of any country depends entirely on the development of transport, because the operation of any enterprise is impossible without transportation, both passenger and freight. Sometimes the specifics of a company's operations require the use of several modes of transport, for example, road transport to a seaport or airport, or road transport from railway tracks. By interacting with each other, different types of transport aim to meet the transportation needs of the population and production. They are interconnected geographically and make up the transport system”[2].

The multimodal transport system is one of the key areas of development of the world's transport systems. Its effectiveness is determined by the level of integration and sustainable development of different modes of transport. In the EU member states, multimodal freight transport is developing at a particularly fast pace due to the steady growth of integration. The issue of developing multimodal freight transport to ensure the competitiveness of Ukraine's transport system and its integration into the European and global transport systems is relevant both in terms of theory and business practice

A transport hub is an important element in the transportation process, connecting and distributing traffic flows. The role of a transport hub is mainly played by the country's major cities. These cities have historical, tourist, economic or industrial significance. For example, in ancient times, cities were built at historically established

road intersections or, conversely, roads were built near settlements. For tourist transport, transport hubs are a place of transfer from one route to another or to a completely different mode of transport. An industrial city, in turn, is a centre for the supply of raw materials from suppliers to manufacturers and the sale of finished products to consumers. Transport hubs, which are mostly located in populated areas, handle cargo transshipment. Therefore, it is most appropriate to locate business facilities, such as terminals and warehouses, in such locations, as transport costs will be the lowest due to logistics management.

Ukraine's favourable geographical location means that four of Europe's ten international transport corridors (ITCs) pass through its territory. According to research by the British Randall Institute on the transitivity coefficient, Ukraine ranks 1st in Europe, but the degree of use of its transport infrastructure is still quite low. Multimodal and intermodal freight transport in Ukraine accounts for no more than 0.5% of the transport market, which is 20-30 times lower than in the EU and other developed countries. Ukraine's transport system borders the Trans-European Transport Network TEN-T, but cannot yet be fully connected to it due to low interoperability and a general technological lag[3, 4]. In Ukraine, there are about 180 cities of national and regional significance, which have formed transport hubs, which are a set of transport facilities at the points of interaction between different modes of transport designed to serve transit, local and urban passenger and freight flows. In addition to railways, they include road junctions with bus stations and a network of roads; water ports; airports; and a network of urban, industrial, pipeline and special transport.

The largest transport hubs in Ukraine :

Kyiv (road, rail, river, air),

Odesa (road, sea, rail, river, air),

Mykolaiv (road, sea, rail, river, air),

Cherkasy (road, rail, river),

Lviv (road, rail, air),

Zaporizhzhia (road, rail, river),

Kremenchuk (road, rail, river),

Dnipro (road, rail, river, air),

Berdiansk (road, sea, river, air),

Mariupol (road, sea, rail, river).

The creation of transport corridors and their integration into the international transport system are recognised as priority national directions for the development of Ukraine's infrastructure. The most important one is the meridional ITC-9, which connects the Baltic Sea coast with the Black and Mediterranean seas. It passes through the cities of Chernihiv - Kyiv - Uman - Odesa on the territory of Ukraine. The corridor connects our country with seven European countries. In addition, two latitudinal international transport corridors pass through Ukraine through the cities of Lviv - Zhytomyr - Kyiv: ITC-3 and ITC-5. The former connects Ukraine with Poland and Germany, while the latter connects Ukraine with six European countries and has access to the Adriatic coast. ITC-7 is called the Danube Waterway, which connects Ukraine with nine European countries. Ukraine is proposing to include three more ITCs in the network: Gdansk-Odesa (Baltic Sea-Black Sea), Eurasian (Black Sea Economic Cooperation) (Chornomorsk-Poti (Batumi)-Tbilisi-Baku) and Europe-Asia (from Germany to China). The latter is called the "Great Silk Road of the 21st century". It covers 16 countries.

The choice of the mode of transport, type of transport and logistics intermediaries is based on a system of criteria. The main criteria for choosing a mode of transport and a type of transport include[5]

- minimum transport costs;
- specified transit time (cargo delivery);
- maximum reliability and safety;
- minimum costs (losses) associated with inventory in transit;
- capacity and availability of the mode of transport;
- product differentiation.

Multimodality allows participants in the transportation process to choose the most appropriate mode of transport in terms of reliability, speed, safety, convenience, and efficiency of cargo delivery over medium and long distances. It involves an

integrated information and telecommunication space that links all processes and all participants into a single system for transporting goods from the seller (supplier) to the buyer (customer) on a door-to-door and just-in-time basis.

The main participants in the multimodal transport system are:

- Cargo owner
- Shipper
- Consignee
- State
- Multimodal transport operator
- Carrier
- Freight forwarder
- Logistics service provider
- Terminal operator
- Stevedoring company (port operator).

Information and computer support for the transport process is also of great importance in multimodal transport. To integrate our country into the global information space. It is necessary to use modern international standards for electronic data exchange (EDI, EDIFACT) in the logistics network and to develop paperless electronic document management. International telecommunication networks, both commercial (CompuServe, America Online, Relcom) and non-commercial (Internet), and satellite communication and navigation systems for vehicles (INMARSAT-C, GPS and others) play a key role in transport.

A successfully integrated transport system involves not only the combination and interaction of all its participants, the creation of a single legal and information field for transportation, but also the coordination of technical and operational characteristics of vehicles, infrastructure, transport equipment, and containers; coordination and optimisation of schedules, development of contact schedules for various types of transport, shippers and consignees, etc.

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OPTIMIZING LOGISTICS OPERATIONS: STRATEGIES FOR EFFICIENCY AND EFFECTIVENESS

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Logistics operations are the backbone of any supply chain, encompassing the complex coordination of activities required to move goods from suppliers to consumers. In today’s global market, optimizing these operations is crucial for companies seeking to enhance their competitiveness, reduce costs, and improve customer satisfaction. This article explores various strategies to optimize logistics operations, focusing on technology integration, process improvement, and sustainable practices.

1. Leveraging Technology