

METHODOLOGICAL APPROACHES AND KEY PRINCIPLES IN THE MANAGEMENT OF MULTIMODAL TRANSPORTATION IN THE FORWARDING INDUSTRY

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This article discusses various methodological approaches and key principles that are essential for effective management of multimodal transportation in the forwarding industry. The author explores the importance of integrating different modes of transportation. The article also highlights the significance of proper planning, coordination, and communication among stakeholders in ensuring smooth and seamless transportation operations. By examining the key principles and best practices in multimodal transportation management, this article aims to provide a comprehensive overview of the strategies and tools available to industry professionals in effectively managing the complexities of multimodal transportation.

Key words: multimodal transportation; uST technology; logistics processes; economic efficiency; freight forwarding; collaboration.

МЕТОДОЛОГИЧЕСКИЕ ПОДХОДЫ И ОСНОВНЫЕ ПРИНЦИПЫ УПРАВЛЕНИЯ МУЛЬТИМОДАЛЬНЫМИ ПЕРЕВОЗКАМИ В ТРАНСПОРТНО-ЭКСПЕДИЦИОННОЙ ОТРАСЛИ

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В данной статье рассматриваются различные методологические подходы и ключевые принципы, необходимые для эффективного управления мультимодальными перевозками в экспедиторской отрасли. Автор исследует важность интеграции различных видов транспорта. В статье также подчеркивается важность правильного планирования, координации и коммуникации между заинтересованными сторонами для обеспечения бесперебойной и беспроблемной работы транспорта. Рассматривая ключевые принципы и лучшие практики управления мультимодальными перевозками, эта статья ставит своей целью дать всесторонний обзор стратегий и инструментов, доступных профессионалам отрасли для эффективного управления сложностями мультимодальных перевозок.

Ключевые слова: мультимодальные перевозки; технология uST; логистические процессы; экономическая эффективность; экспедирование грузов; сотрудничество.

The transportation industry contributes to the socio-economic development of the country, its regions, the improvement of the quality of life of the population by ensuring the delivery of raw materials, components, equipment to the place of production and finished products within the country and abroad, as well as the transit of goods.

The purpose of transport work is to provide the national economy and population with transportation services to the maximum extent possible. If we consider transportation services as a resource that is used by the entire national economic complex and the population of the country, then the increase in the efficiency of the result of all spheres of the national economy depends to a large extent on the quality, rationality and efficiency of transportation.

Thus, the indicator of transportation efficiency cannot be limited by the scheme of income minus costs, but should be assessed by a set of technical and economic indicators.

The complexity of the interaction of modes of transportation lies in their different principles of operation. However, in multimodal transportation there is an opportunity to use the advantages of the involved modes of transport. Such transportation has a relatively low cost and contributes to improving the environmental component, ensuring traffic safety, saving fuel and electricity. For example, the introduction of multimodal transportation provides cost reduction by 15-20% [1].

The world has become more interconnected than ever before, and global trade has increased exponentially. Multimodal transport plays a critical role in facilitating this trade by enabling businesses to move goods across different modes of transport with ease. Some of the reasons why multimodal transport is crucial in today's global economy are:

- It enables businesses to reach new markets and expand their customer base;
- It allows for more cost-effective and time-efficient transportation of goods;
- It reduces the risk of damage or loss of goods during transportation;
- It facilitates the movement of goods across borders and customs procedures [1].

Effective organization of logistics systems in multimodal communications is provided by the technique of estimating the maximum capacity of the transport network based on the Ford-Falkerson theorem of maximum flow and minimum cut and the technique of predicting the interference of weather conditions in the process of cargo transportation based on the use of the mathematical apparatus of Markov chains. The matrix of transient probabilities of the Markov process by statistical data on the start and end dates of weather phenomena affecting transportation is used in practice.

Application of all the developed mathematical apparatus at the transport and logistics enterprise and system integrator in the logistics of multimodal transportation allows to reduce the time of cargo delivery by 18-20%, and the total cost reduction is possible up to 15% [2]. The greatest positive effect from the application of the mathematical apparatus will be achieved at enterprises with large volumes of incoming cargo traffic.

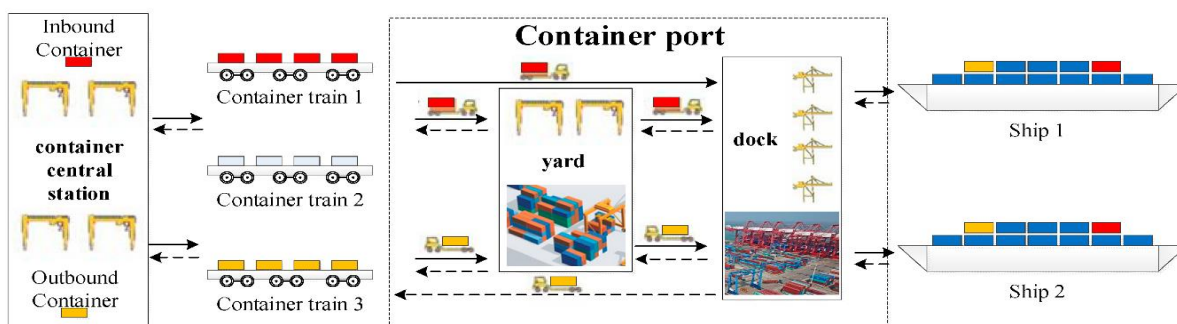
It is important to mention, that one of the methods of reducing the economic risks of an aviation company is forecasting various performance indicators, such as traffic volumes, revenue, expenses, the required fleet of aircraft, routes and direction of transportation. Also in the study, such methods as statistical and scientific cognition method were used.

In order to remain successful and competitive, they are actively implementing digital technologies and new methods of logistics process management. It is these changes that lead to the evolution of logistics approaches and emphasize the need to continue to look for new methods to improve the efficiency of transportation and the quality of services.

We believe that for the aviation industry it is necessary to leave the traditional approach and attach a new approach to continue the development of the aviation sector in the future, determined by constant changes. The need for new, innovative thinking approaches dominates, which will allow states and the industry to respond to certain challenges and create a strong, viable and stable aviation sector in 2023-2025 economic globalization and the concept of changes coming in the environment contribute to the development of innovative solutions and the use of multimodal networks to optimize practicality [2].

Forecasting global trends and trends in the development of air cargo transportation, taking into account the imposition of sanctions and import substitution policy, is a difficult task, and various external factors can influence this.

It is a fact that in 2024 DP World is interested in using uST technology in the field of maritime transportation. During the meeting the representatives of the company discussed the possibilities of integration of uST elevated complexes into current and upcoming port projects [3].



Scheme of sea transportation at the port of departure

During the meeting special attention was paid to the advantages of uST cargo complexes – unicont, unitrak and unitrans. In particular, unitrak and unitrans are suitable for optimization of marine logistics and transportation of raw materials. Unicont may become an efficient solution for cargo delivery to an international container terminal or rail terminal within a port in the coming years.

Transportation placed on the second level can act as a link between the port and logistics hubs. This will significantly reduce the time and cost of cargo delivery. The uST complexes will ensure a uniform rhythm of cargo handling and, if necessary, can completely eliminate storage volumes on the port territory.

By using an elevated string-rail trestle, seaports can be built at a distance from the shore. This will eliminate the work and costs that are necessary when building ports near land in the case of sea transportation. Unimobiles will ensure the smooth delivery of goods in automatic mode along the track structure connecting port and land.

In the summer of 2024, DP World representatives invited engineers from uST Inc. to visit existing ports to explore the potential applications of uST technology [3].

In conclusion, the successful management of multimodal transportation in the forwarding industry requires a combination of different methodological approaches and adherence to key principles. By adopting a systematic and comprehensive approach that takes into account the unique characteristics of each mode of transportation, forwarders can ensure the efficient and cost-effective movement of goods across various modes. Key principles such as collaboration, information sharing and technology integration are essential for optimizing logistics processes and enhancing customer satisfaction. Overall, leveraging the right methods and principles can help forwarders overcome the challenges associated with multimodal transportation and achieve their business objectives.

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