

**IMPROVING EFFICIENCY OF SUPPLY CHAIN MANAGEMENT**

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*The article presents the results of the analysis of an enterprise logistic system to identify ways to improve the efficiency of supply chain management of products to the external market. The proposed measures to substantiate the choice of the route of transport, the best option for delivering products to the external market between tank wagons and tank containers, improving information and documentation support, remote monitoring system of transport management, expanding the geography of an enterprise's products are pointed out.*

In the market economy, the sustainability of an enterprise is largely determined by how deeply the degree of development of interaction between participants in processes occurring both inside and outside its logistic system is studied. Therefore, ensuring sustainable development of an enterprise is possible only with sufficient study of all supply chains, from mining sites to a focal enterprise and intermediaries selling products to end consumers. The formation of inter-company communications, including manufacturers, trade and intermediary organizations, financial institutions, is carried out within the framework of integrated supply chains, where logistic operators act as a system integrator. This approach is implemented in the framework of the logistic concept of supply chain management.

Supply chain management is a process of planning, execution and control (in order to reduce costs and fully meet customer requirements) of a material flow (material resource flow, work in progress, finished goods), as well as information related to it, service and financial flows from their point of origin to the point of final consumption (including import, export, internal and external movements). The essence of the concept of supply chain management is the rationalization of logistic operations throughout the product life cycle (development, production, sale of finished products and their after-sales service) [1, p. 3].

Supply chain management is closely linked to the economic strategy of business entities. Effective supply chain management is one of the decisive factors for the sustainable development of an enterprise in today market conditions. Supply chain management is aimed both at optimizing inter-organizational interaction based on modern management methods and information technologies, as well as at optimizing intra-company processes. The practice of implementing a supply chain management system suggests that this concept is fundamental in modern logistics and will continue to evolve rapidly in the future [2].

Research of the effectiveness of supply chain management was carried out at one of enterprises of the petrochemical complex of the Republic of Belarus, which has a significant positive impact on the growth of the national economy. The purpose of research is to identify promising areas of development of this enterprise in order to improve the efficiency of supply chain management for the supply of its products to the external market.

The main activity of the enterprise is the production of high-pressure polyethylene, acrylic fibers, organic synthesis products, low-tonnage chemistry, mineral fertilizers, fractions and pyrolysis products, consumer goods. The products manufactured by the company are competitive due to high quality, diverse assortment and active logistics, it is widely known and has numerous consumers in both internal and external markets.

The results of the analysis of the existing logistic system of an enterprise indicate that it is not able to effectively ensure the supply chain management of products to the external market in the conditions of globalization and sustainable development of a market economy.

In the supply chain management of the enterprise, a number of shortcomings have been identified. They should be given special attention:

- the route of movement of vehicles upon delivery of products to the external market is determined in a non-optimal manner;
- the choice of modes of transport for the delivery of products to the external market is not justified by anything;
- prevalence of paper data processing technology;
- insufficient functioning of the system of remote monitoring of transport management;
- the need to expand the geography of deliveries of products of the enterprise.

These drawbacks significantly affect the efficiency of supply chain management and the sustainability of the enterprise as a whole.

To eliminate the above-mentioned shortcomings, we consider it necessary and expedient to suggest a number of events, namely:

- design and justification of the choice of the route of movement of vehicles and modes of transport for the delivery of company products to the external market;
- the choice of the optimal way of delivering to the external market between tank wagons and tank containers;
- improvement of information and documentation support of the enterprise;
- improving the system of remote monitoring of transport management in supply chains;
- expanding the geography of the enterprise products.

Consider the content of these events in more detail.

1. Design and justification of the choice of the route of movement of vehicles and modes of transport for the delivery products to the foreign market. Design and justification of the route and modes of transport for the delivery of products to the foreign market was proposed using the example of the acetone cyanhydrin delivery from Belarus to China. The acetone cyanhydrin is one of the types of products manufactured by the company, which is in great demand in the international market. Efficiency of the enterprise depends on low logistics costs.

As a result of weighing many options, it was decided to consider three options for the delivery of the acetone cyanhydrin: automobile transport, automobile and sea transport, rail and sea transport.

Having developed and analyzed three possible routes for the delivery of the acetone cyanhydrin from Belarus to China we choose the third option "rail and sea transport" because, despite the fact that it is longer than the first one, it is much safer and more economical all others.

2. The choice of the optimal variant of the delivery products to the external market between the tank wagons and the tank containers. We consider two possible options for the delivery of cargo: tank wagons and tank containers.

Delivery of acetone cyanhydrin to tank wagons from Novopolotsk station (Belarus) to Tallinn station (Estonia) by rail (and own tanks), then transshipment and delivery to the port of Tallinn (Estonia) and the final stage will be shipping from the port of Tallinn (Estonia) to the port Lianyungang (China). Transportation of acetone cyanhydrin in tank containers will be carried out in 20-foot tank containers T14, which will be rented. In both cases, both rail and sea transport will be used.

To determine the method of product delivery, the calculation of the total cost of transportation of ACG from Novopolotsk (Belarus) to Lianyungang (China) was made, which amounted to 282,300 euros for carriages in tank cars and 371,236 euros in tank containers. Such a difference in the total cost can be explained by the fact that the tank container is not owned, but leased, in contrast to tank cars, which are the property of the enterprise. Therefore, for the delivery of acetone cyanhydrin from Novopolotsk (Belarus) to Lianyungang (China), it is more economical and more expedient to use tank wagons.

3. Improving information and documentation support of the enterprise. In modern conditions, regardless of the type of activity and industry sector, the performance of any work and the solution of any task are always associated with the use of already well-established information support at a sufficiently high level. Information support is designed to help better organize business processes in the enterprise.

To improve information and documentation support of the enterprise in order to ensure the effectiveness of supply chain management, it is necessary to introduce an electronic document management system. In this regard, we offer the implementation of the OPTIMA-WorkFlow software platform in the enterprise.

OPTIMA-WorkFlow is a software platform for creating document management systems (electronic document management), provides a comprehensive automation of the processing of documents and allows you to go to paperless technology to work with electronic documents [3].

The main workplace of the user of a software product (such as an information center) will consist of all the necessary components to ensure the smooth operation of virtually all structural divisions of the enterprise, which will lead to an increase in labor productivity. The maximum implementation period for the OPTIMA-WorkFlow software platform is 9 weeks. Its payback will not make you wait long.

4. Improving the system of remote monitoring of transport management in supply chains. For the enterprise in question, we propose the introduction of the PRO CAN module navigation system.

PRO CAN module is a premium product in its class. The module program is being improved and remotely updated. New features are added to it according to customer requirements. In addition to the basic PRO CAN

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functions, the module is equipped with a built-in battery, 4 fuel level sensors, 2 flow meters, 3 thermometers, 4 discrete systems, a voice communication link with the driver are connected to it [4].

The operation of the system is as follows: the monitoring module is installed on the vehicle, connected to the on-board computer. The dispatcher determines in real time the location, route, car mileage, real fuel consumption, the volume of gas stations, identifies uneconomical driving style, suspicious downtime, determines the driver's working time and much more. On the screen of a computer or mobile device we see an electronic map with all the cars and mobile workers, as well as all the most important analytical information.

Thanks to the implementation of the PRO CAN module navigation system, the efficiency of supply chain management in the enterprise logistics system is improved, and there is a saving on the technical operation of vehicles.

5. Expansion of the geography of the enterprise's products. As a result, the analysis of the external market, as potential and promising international markets for the sale of the enterprise's products, were considered countries such as France, Spain, Iraq, Korea and Indonesia that have not yet been developed.

Country profiles were ranked by attractiveness and risk factors. Factors of attractiveness include population size, gross domestic product per capita, constant demand, etc. The risk factors include the inflation rate of the national currency, the distance of transportation to the capital, the level of competition in the national market, etc. The selection of potential markets for the sale of the enterprise's products was carried out by building a map of the countries attractiveness-risks. Some countries (for example, Indonesia) have the highest rate of attractiveness, but the risks that an enterprise may incur when interacting with a given country are also high. In such cases, we offer the enterprise to refrain from penetrating into such markets.

Thus, from the proposed measures it follows that the efficiency of supply chain management plays an important role in increasing the sustainability of the enterprise to ensure its long-term development. In this case, improving supply chain management involves selecting promising routes and economical modes of transport for delivering products to the external market, choosing the optimal delivery option, improving information and documentation support and a remote monitoring system for transport management, expanding the geography of deliveries of an enterprise.

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