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**EFFICIENCY OF THE INTERNATIONAL SUPPLY CHAIN MANAGEMENT
OF THE OUTPUT OF INDUSTRIAL ENTERPRISE****ANGELINA PETKEVITCH, JOHN BANZEKULIVAHO**
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In the article approaches to determination of a concept «supply chain management» are analyzed, the main principles of effective functioning of supply chains are described, the methods of their organization are considered, and also the mechanism of the management of international supply chain of the output of industrial enterprise is developed.

The term "supply chain management" first appeared in the West. It was first formulated by a well-known system integrator - the company «i2 Technologies» and the American advisers, particularly the company "ArturAndersen", in the 80s and subsequently has gained great popularity [1].

There are many interpretations of the concept "supply chain management". The concept "supply chain management" is not interpreted in the same way by all authors and in different periods had different approaches.

Such a variety of definitions of the term "supply chain management" is connected with a number of reasons among which it is necessary to note the following:

1. Supply chain management has a short period of historical development as supply chain management as well as logistics are relatively new and dynamical sciences in the modern economics.

2. In the world practice there are various national schools which are engaged in studying and researches in the field of logistics and supply chain management.

3. Logistics and supply chain management are interdisciplinary sciences, and are at the intersection of marketing, operational and strategic management, econometrics, computer science etc.

4. The absence of some terms in the field of logistics and supply chain management in other languages. It is connected with the belonging of different authors to this or that logistic school, and also with the desire to concentrate attention on separate aspects of logistic process [2–9].

In our opinion, supply chain management is the organization, planning, control and regulating of flow of goods, starting with the reception of an order and purchase of raw materials and materials for production support, and further production and distribution and its final delivery with optimum costs of resources to the end user according to requirements of the market.

Successful variants of realization of the concept of supply chain management (in relation to economic growth) allow to single out specific models of behavior. To achieve the best level of performance and management of processes in a supply chain, it is necessary to consider the following principles:

1. The segmentation is implemented taking into account customers, their service requirements, including specific groups of customers.

2. The adapting of a chain of creation of material values considers requirements on maintenance and profitability of all segments.

3. The requirements planning during all supply chain aims at provision optimal distribution of resources.

4. The product differentiation is carried out on approaching the customers.

5. The strategic management of supply sources aims at total costs reduction.

6. The development of strategy of realization of technology intends for the whole supply chain, providing multistage decision-making with monitoring of flows of goods, services and information.

7. The determination of variable indicators in a supply chain is focused on providing effective and high quality service for end users [10].

Thus, it can be said that following these principles in supply chain management, it is possible to reach higher level of performance throughout all the chain.

Supply chain management can be organized in various ways:

1. The contract stipulates identical requirements to suppliers at all levels. In this case the system can be self-organizing; business competition and market principles of the organization of the process are preserved.

2. The multilateral agreement between the buyer, the logistic company or the companies and suppliers is entered into. This variant is good as it allows to work out an optimal supply chain and distribute money funds between the participants of the process reasonably. It results in decrease of cost price at the expense of liquidation of unproductive links. The competition in this case remains. One multilateral agreement may be replaced by two and three-party agreements. For this purpose the buyer should conclude an agreement with the direct supplier, the transport company, and the suppliers of the main raw material.

3. The organization of suppliers of one level in associations and the conclusion of contracts with them. Thus, the most part of administration work is removed from the buyer and is passed to executive groups of associations. But then the competition among suppliers of one level vanishes, and the suppliers who have joined the association receive essential competitive advantages over independent enterprises. In the future this scheme leads to the organization of a single, extremely big supplier, capable to dictate conditions to other participants of the market.

4. The organization of a chain of suppliers in associations, but this time in a vertical direction. In time, this form of organization can lead to the formation of corporations, capable to dictate conditions to other participants of the market; that is violation of antimonopoly laws [11].

The effectiveness of supply chain management in a generalized form can be presented as market, intercompany effect and effect of the supplier.

Market effect. Supply chain management allows to reach long-term competitive advantages. The consecutive orientation of processes on customers and their desires may lead to the possible increase in the level of service and customer satisfaction. Cumulative coordination in a supply chain gives an opportunity to reduce a lead time of the order and delivery, to increase level of trust and loyalty from consumers. Besides, supply chain management promotes a close cooperation between the organizations-participants, an acceleration of innovative processes and development of new market outlets.

Intercompany effect. Thanks to the optimized forecasts of the demands supported by information-technical base, and also a constant exchange of information on capacities and arising "bottlenecks", supply chain management system creates a transparency of the information on the quantity of stocks, sales amounts, terms of order processing etc. It gives the chance to considerably reduce stocks, to boost production and efficiency of infrastructure, to optimize the sizes of delivery lots, to raise a service level and, finally, management efficiency over all supply chain.

Effect (benefit) for suppliers. Within supply chain management alongside with customer-oriented approach the use of information technology allows to tap new markets, which gives the chance to suppliers to expand existing borders of the market.

Effective coordination of intercompany and interorganizational processes with the potential advantages described above is seen as an important factor of essential reducing of costs of processes on all the supply chain [10].

Let us consider the process of forming of international supply chain for such kind of output of industrial enterprises as acetonecyanohydrin.

Acetonecyanohydrin is used:

- for obtaining methyl ester of methacrylic acid;
- for production of methacrylic acid;
- during synthesis of other chemical products.

Acetonecyanohydrin is characterized by a high quality level; therefore it is in increased demand in the world market. Acetonecyanohydrin is used in fiber industries. The main sales markets for acetonecyanohydrin are China, Russia and Latvia.

In order to work out a complete supply chain of acetonecyanohydrin, we will formulate the initial data:

- the scope of delivery – 2000 tons;
- the transportation from Novopolotsk (Belarus) to the port of Lianyungang (China).

The first priority for achieving the stated objective is the development of shipping options for delivery of the acetonecyanohydrin from Novopolotsk to China. Thus, basing on the available data, and also points of departure and destination, we have developed the following variants:

- 1) the automobile transport from Novopolotsk to China. The route passes through Belarus, Russia, Kazakhstan, China. Total distance - 8900 km;
- 2) the automobile and sea transport from Novopolotsk to China. The route will be mapped through Belarus, Lithuania (to the port of Klaipeda), and then by the sea transport to the port of Lianyungang (China);
- 3) the railway and sea transport from Novopolotsk to China. The route will lie so that at first the cargo will be transported by rail transport to Estonia (the station of Vajvara), and then by sea transport from the port Sillamae (Estonia) to the port Lianyungang (China).

As the result of processing and analysis of the three possible routes of delivery of acetonecyanohydrin from Novopolotsk to China, finally, we chose the third variant "by railway and sea transport" as in spite of the fact that it is longer than the first, however it is much more reliable and more cost-effective than the others.

Proceeding from the developed shipping options acetonecyanohydrin from Novopolotsk to China, and also considering that the variant «railway and sea transport» has been chosen, we will consider two possible shipping options of cargo delivery - in tanks-wagons and in tanks-containers.

In tank tanks-wagons - delivery of cargo from Novopolotsk to the station Vajvara (Estonia) by railway (and tanks being own ones), then transfer and delivery to the port Sillamae and finally it will be transported from the port Sillamae to the port Lianyungang.

In tanks-containers – transportation will be performed in 20-foot bulk tanks-containers T14. Tanks-containers will be leased.

In the transportation of cargoes by railway the transportation agreement is made between the railway communications and the consignor. According to the regulations, the railway is obliged to deliver the entrusted cargo to the destination and to give out to its receiver; and the consignor - to pay the established payment for the transportation. The basic document at railway transportation is the waybill. It is filled by the consignor on each sending and at cargo issue is handed over to the consignee. Safety of cargo and observance of terms of its delivery in many respects depend on correct filling of a waybill. Besides, the precise drawing up of a waybill promotes safety of movement of trains, acceleration of wagon turnaround and correctness of calculations for transportation.

The transport railway bill of lading (waybill) consists of four sheets:

- Sheet 1 – the original of the transport railway bill of lading (together with the road sheet follows with cargo to a railway station of destination where is handed out to the consignee);
- Sheet 2 – the road bill;
- Sheet 3 – the counterfoil of the road bill (is left at a railway station of departure);
- Sheet 4 – the receipt on cargo reception (issued to the consignor).

Thus, the waybill has legal and settlement value, therefore its columns should be filled in by the consignor distinctly, without erasures and blots.

Under the agreement on maritime transportation of cargo the carrier undertakes to transport the cargo in the port of destination and to transfer it to its receiver, and the sender, in turn, undertakes to pay an established payment (or the freight) for cargo in advance

The basic document for transportation by sea transport is the bill of lading. The bill of lading is a document which is given out by a carrier of cargo to the freight owner. It certifies the property right to shipped good. The bill of lading has several functions. It is constituted in two or more copies by a carrier on the basis of the shipping order shown by a consignor, or the consignor. One copy follows together with the cargo, and the second is handed out to the consignor.

Also during the transportation of a cargo availability of financial consignment and allowing documents is necessary.

Summing up aforesaid, it is necessary to note that the cargo transportation will be carried out by railway and sea transport; the basic carriage documents are the waybill and the bill of lading, and also the variant of the transshipment bill of lading which is used when the maritime transport is only part of general transportation and that will probably be easier, than concluding contracts with each of the carriers.

REFERENCES

1. Логистика и управление цепями поставок [Электронный ресурс]. – Режим доступа: <http://logscm.ru/> /. – Дата доступа: 20.12.2015.
2. Сток, Дж.Р. Стратегическое управление логистикой / Дж.Р. Сток, Д.М. Ламберт ; пер. с 4-го англ. изд.– М. : ИНФРА-М, 2005. – 797 с.
3. Cohen, S. Strategic Supply Chain Management : The Five Disciplines for Top Performance / S. Cohen, J. Roussel. – NY : McGraw Hill, 2005. – 316 p.
4. Gattorna, J. Living supply chain / J. Gattorna. – London : Pearson Education Limited, 2006. – 337 p.
5. Gundlach, G.T. The changing landscape of supply chain management, marketing channels of distribution, logistics and purchasing / G.T. Gundlach, Y.A. Bolumole, R.A. Eltantawy, R. Frankel // Journal of Business & Industrial Marketing. – 2006. – Vol. 21. – № 7. – P. 428–438.
6. Mentzer, J.T. Fundamentals of supply chain management : twelve drivers of competitive advantage / J.T. Mentzer. – London : Sage Publications, 2004. – 304 p.
7. Аникин, Б.А. Логистика и управление цепями поставок. Теория и практика. Основы логистики : учебник / под ред. Б.А. Аникина и Т.А. Родкиной. – М. : Проспект, 2013. – 344 с.
8. Содержание концепции SupplyChain Management [Электронный ресурс]. – Режим доступа: <http://logsystems.ru/articles/soderzhanie-kontseptsii-supply-chain-management/>. – Дата доступа: 20.12.2015.
9. Петрова, А.В. Управление цепями поставок : консп. лекций / А.В. Петрова, А.В. Вохмянина. – Екатеринбург : Изд-во УрГУПС, 2012. – 56 с.
10. Концепция управления цепью поставок и потенциалы преимущества с позиции интегрального менеджмента [Электронный ресурс]. – Режим доступа: <http://old.creativeconomy.ru/articles/7323/>. – Дата доступа: 20.12.2015.
11. Хендфилд, Р.Б. Реорганизация цепей поставок. Создание интегрированных систем формирования ценности / Р.Б. Хендфилд, Э.Л. Николс, мл. ; пер. с англ. – М. : Вильямс, 2003. – 416 с.