

Economic Analysis of Logistics Network in the Context of Supply Chain Management

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Abstract

At present, the market economy system is constantly reforming and upgrading, and the market competition is becoming more and more intense, which also brings new challenges and opportunities for various industries. The application of supply chain management in logistics network can effectively create revenue for enterprises, optimize the sharing and joint utilization of their information resources. It is a scientific and advanced management mode in today's environment. So how to effectively maximize the benefits of supply chain management logistics network and enhance the core competitiveness of enterprises, the following will be the background of supply chain management, logistics network economics of win-win strategy, risk and credit and other aspects of the specific analysis, the use of economic principles to explore the concept of enterprise logistics management, technology backwardness and other issues and put forward relevant strategies for reference.

Keywords: supply chain management, logistics network, economic analysis

1. Introduction

1.1 Supply Chain

The supply chain is the chain of interests formed by the combination of suppliers, manufacturers, storage depots and distribution logistics in the process of transforming goods from raw materials into finished products and delivering them to consumers through the sales network. The supply chain is a complex system, and it is important to develop a safe and efficient management model to make effective use of its role. The management of the supply chain is the main use of organization, coordination, management, control, and other ways to deploy the information flow and logistics that may be involved in the production process of the product, while already understanding and being familiar with the laws and interrelationships of each step, to improve efficiency and ensure the maximum added value for the user on the basis of quality and at the lowest cost.

If companies want to legally seek benefits in it, they need to guarantee the effective improvement of production efficiency and the appropriate number of products, and always pay attention to whether the communication and cooperation channels are good and smooth. The supply chain itself has the characteristics of globalization, and the cost is one of the more rapidly developing industries today, and the logistics network must have a well-planned logistics system to maximize the benefits for the enterprise, so it is necessary to optimize both the location of the equipment and the mode of transportation together.

1.2 Logistics Network in the Supply Chain Management Environment

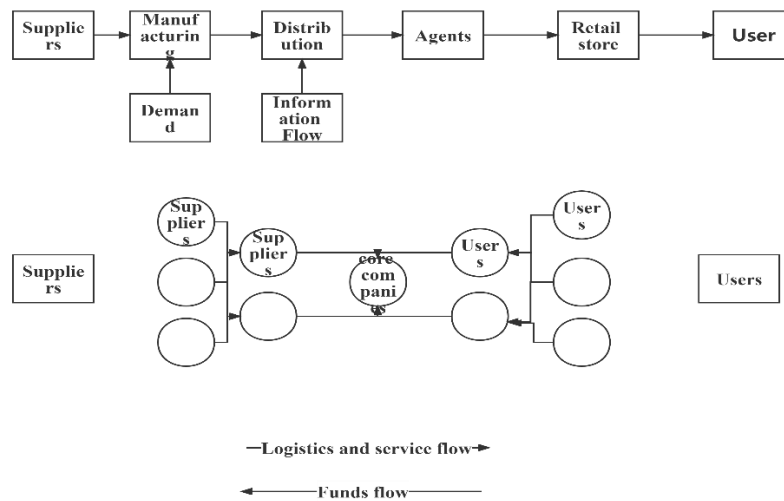


Figure 1. Logistics Network Flow Chart

The role of logistics for the whole supply chain mainly includes transportation, distribution, and communication, while the supply chain is the basic premise and service object of logistics existence, and the fundamental meaning of logistics existence is dependent on the supply chain, just like a bond that connects the three parties in the supply chain closely throughout, which can ensure pleasant communication and smooth cooperation among enterprises. As can be seen from the above diagram, the supply and demand cooperation relationship that exists at every stage from supply to demand, and the full extension of the logistics system to form the supply chain by integrating and classifying the enterprises upstream and downstream within the supply chain, is a value-added service for the process of information and product delivery from raw materials to consumers and unifies the process of managing all the actions of enterprises and logistics. Because global bulk purchasing is the main method among enterprises, it cannot be carried simply by human labor, so from the beginning of the purchase of raw materials, logistics has already played its role. The importance of logistics is highlighted by the supply chain of transporting products from suppliers to users, and many companies realize the improvement of corporate interests through the rational use of scientific and modern logistics systems within the supply chain. The significance of the extension and expansion of the supply chain to the logistics system is to realize the value process of products from raw materials to finished products, and at the same time, it can also control the latest market trends and the understanding of the latest product information in real time, so the supply chain and logistics are complementary and closely related to each other.

The core enterprise can be a large retail industry or a product manufacturing industry, and each joined enterprise will form one of the nodes under the impetus of professional union. This one node is driven by demand information and cooperates and divides labor through the functions of supply chain, such as production, delivery, distribution, sale, etc., and uses the shared control of capital flow and information flow, and then realizes the collective continuous value-added of the whole supply chain. Purpose There are generally two ways to manage logistics in the context of supply chain: the first one is to entrust the third-party logistics, and the second one is to operate by the enterprise itself. From the current development, people support the management mode of third-party logistics, and even infer that in the future, self-owned logistics will be outlawed by third-party logistics.

1.3 Upgrading of Information Delivery Model in the Supply Chain Environment

In the budding period of logistics enterprises, there are still certain limitations, the main way to transmit, feedback information, demand information is to "pass by level". Once the information is wrong, it will directly affect the accuracy and timeliness of the decision of the superior leaders, causing serious consequences such as slowing down or even regressing the market development. From the perspective of the practical interests of enterprises, if they cannot accurately grasp the market-related information, they cannot follow the market trend to produce the real needs and favorable angles of consumers at the moment, the leadership decision-making

ability decreases, there is no goal when working within the enterprise, and there is no accurate production plan, and eventually the enterprise will have serious economic losses and delay the future development of the enterprise.

Under the influence of the current supply chain environment and economic and social trends, the information transfer mode has changed from the old mode of passing on information from one level to another to "information sharing". The information transfer in the supply chain environment is supported by the network information data, which can share the information in the supply chain. For example, companies can access the latest market trends and other information in real time by checking the EDI website in the shortest possible time, so that they can find out the problems in the supply chain and deal with them in a timely manner. Therefore, the new information transfer mode in the supply chain environment is more rapid and convenient.

2. Research Overview

Early economists did not have the concept of logistics and they discussed it only in the context of production activities. However, economists were positive about the value created by transportation activities. Smith, when talking about the use of capital, pointed out that the capital used for transportation and distribution was also one of the methods of capital investment and was closely connected with the capital used for production and consumption. However, Smith was influenced by the agrarian school and did not consider the distribution sector as a non-productive sector and did not fully understand the value created by the transportation industry. In his discussion of the labor effects of commerce and transportation, Say argued that both expanded the value of goods. Most of the transportation of goods was done by merchants before the transport industry was developed and became independent. He affirmed the role of logistics activities in the process of commodity circulation in increasing the value of goods. Marshall fully inherited Say's mantle and argued that logistics activities do not produce matter but utility, which also creates value.

As some development economists have studied the laws of economic development, logistics infrastructure development has entered the scope of discussion among economists. Rostow particularly emphasized the importance of social prior capital investment, commonly known as infrastructure investment, in the process of economic take-off phase to sustained economic growth phase of the transformation process. He believes that the most important function of this type of investment is to reduce transportation costs and expand the domestic market, effectively combining existing resources to create a market environment for the emergence of a dominant sector. In discussing the relationship between the development of social indirect capital and direct production activities, Hochman emphasizes that an adequate supply of social indirect capital will induce the expansion of production activities and the coordinated development of both will contribute to the development of the economy.

With the proposed industrial division combined with the shift of industrial focus economists have divided the economy into different stages. When discussing the advancement of economic development stages, it is inevitable to talk about the role of the transport, communication and storage industries related to the logistics industry. However, most economists focus on the shift of industrial focus to the tertiary sector, which has increased in importance in the process of economic development, but not on the role of the logistics industry in promoting economic development. They believe that the transport industry played an important role in the take-off stage (Rostow) and that it developed significantly in the industrialization stage and played an important role in the advancement of industrialization (Colin). However, the role of the transport industry has been weakened in the stage of rapid development of the tertiary sector.

3. Method

3.1 The Economic Analysis of Logistics Network in the Context of Supply Chain

The analysis of logistics network under the perspective of economics is mainly aimed at the parties that promote the interests and promote the satisfaction of Pareto Optimality (Pareto Optimality) related phenomena for all parties. At this point, efficiency maximization is formed when the remaining transaction volume is reasonably distributed so that the vested interests of each party show an upward trend compared to the previous one. Logistics economics is the study of the economic relationship between logistics system and logistics activities, through the rational use of macroeconomics, logistics, industrial economics, engineering economics, operations research and other related disciplines of theory, in-depth investigation of logistics market supply and demand, logistics resources allocation, logistics industry growth, logistics industry organization and macro logistics industry development and other multi-room issues of an applied Science. Through the application of mathematical methods, it analyzes the problems of the entire logistics system and proposes strategies to solve them, thus helping enterprises to achieve increased benefits. Then, it can be seen from the definition of logistics

economics that logistics network in the supply chain environment has a very close relationship with logistics economics. The following paper analyzes three aspects of network economic effects, risk, and credit, and win-win strategies.

4. Results

4.1 Network Economic Benefits

1). The overall characteristic of the network is interdependence and survival among members, and the interdependence among network members amplifies the value of efficiency and existence of all individuals in the network. In the network logistics under the supply chain environment, the overall effectiveness of many enterprises interconnected and interacting with each other is far more than the sum of the individual effectiveness of each enterprise. For example, China Storage Group has 64 warehouses in major ports and economic centers throughout China, forming a huge network that is closely connected and covers the whole country. Customers choose CPS because it can provide warehousing, transportation, and logistics services, and for the reason that the enterprises can complement each other, such as logistics intermediate processing, international freight forwarding, electronic distribution centers, etc. The members of its logistics network are interdependent on each other, and these businesses can provide high quality services and quality efficiency, providing multiple convenience to customers, while other enterprise members can achieve mutual profits. The logistics network constitutes a logistics system, and the service is the most important product in this system. If a logistics enterprise's main output product is service, then only a good combination of information processing, packaging, storage, handling, transportation, circulation processing and other service functions can run the logistics network smoothly.

If you want to successfully realize enterprise sales, you can't do without strong support and strong development of multiple auxiliary function products. And there is an interdependence between auxiliary products, which is the network effect in economics. Logistics network can give full play to this network effect, and then achieve synergy and cooperation, complementarity, diffusion and checks and balances.

2). From the consumer's point of view, logistics network organization has the unique characteristics of flexibility, which can provide more goods that meet the consumer's needs for production. The meticulous production methods and management ideas of multiple categories, low consumption, high quality, and small lots are very different from the products into a refined market, within which companies do not need to compete directly and can fully propose prices to consumers based on the principle of price discrimination in economics. Such a marginal revenue enhancement and price can yield more consumer surplus to the firm or producer.

4.2 Risk and Credit Theory

The resistance to risk is one of the reasons that make the formation of strategic alliances between firms, excluding financial risks, there are a variety of technical, strategic, and commercial risks. The key reason for logistics networks to reduce risk and to reduce losses by sharing risks is the possibility of bringing more specialized resources associated with an issue. Of course, there are some risks associated with strategic alliances themselves. The actual relationship between firms under the supply chain is a principal-agent relationship, and then because of the principal-agent process there is a common risk of moral hazard of agents and the risk of making decisions in the context of incomplete information, etc. Moral risk arises from the fact that agents have private information. Through information asymmetry, it is "adverse selection" to mislead the partner before signing the contract. However, in most cases, when a principal and an agent enter a contract, both parties subjectively believe that they have the relevant information about each other and that they agree about the information, but after a principal-agent relationship is established, this situation changes, and the principal cannot directly observe the level of effort and private information of individual agents. In such a situation, the principal's interests may be weakened or directly harmed by the agent's use of private information by certain means. Moreover, in economic activities, there is often information asymmetry, and economic contracts are executed under the condition of information asymmetry, so it will be difficult to prevent moral hazard effectively.

Assuming that both the agent and the principal are risk-neutral, uncertainties about the agent and the level of effort do not matter. The entire risk will be fully borne by the risk-neutral agent, and the principal will be required to pay a benefit that is fixed and unchanged by any factor. Since the benefit received by the principal has been a constant and constant, and the agent's level of effort and supervision will not bring him any form of benefit, there is no need to supervise the agent, and this assumption guarantees an efficient distribution of institutional arrangements and reduces risk.

Assuming that the principal is risk neutral, but the agent, unlike the principal, is a risk avoider, the only way to get a lucrative benefit and accelerate the agent's contracting is if the risk neutral, i.e., the principal, takes all the risk. If the conclusion of the contract depends on the outcome, a fixed contract is tantamount to forcibly removing the agent's motivation, so that his reward is completely unrelated to his efforts. Therefore, the agent must be motivated to work in such a way that his effort is closely linked to the final payoff to stimulate the agent.

However, since the structure of output is influenced by many factors, this means that the agent must bear many risks and should be provided with "insurance" regardless of whether his principal is risk neutral or not, to reduce the proportion of the principal's return that is affected by uncertainty.

The degree of supervision cost and risk sharing is a way to measure the organization of logistics networks, and the above discussion of the two assumptions that one party is insured cannot constitute network cooperation. Therefore, within a logistics network partnership, it is relatively more effective if a richer partner or risk-reducing neutral takes on more risk. In the event of unforeseen disputes, they can be negotiated together, while the market will turn to the courts for a decision. This is because of the credit base that exists in logistics networks.

4.3 Win-Win Strategy

The current situation in China is that the development of technology has gradually led to many advanced and scientific manufacturing methods, including lean manufacturing, global manufacturing, virtual manufacturing, rapid manufacturing, etc. However, the most original organizational form of most enterprises has changed and updated into a new model, whose basic characteristic is a dynamic alliance based on the formation of a network of aggregated enterprises, and the main feature is resources.

In this context, the market competition object has also changed, not in the original competition between enterprises and enterprises, really over the days of the supply chain, logistics alliances and other objects between competition. So, companies must start exploring cooperation skills, and the object of cooperation is other companies.

When enterprises compete while joining the new logistics alliance, it is more necessary to clarify the way of competition between enterprises, which is also called "competition and cooperation" in the process of logistics alliance under supply chain management, this benign competition is intended to test the core competence of enterprises. Therefore, it is necessary for enterprises to effectively create enterprise value based on their own strengths and to maintain them for a long time, and to have some key means to be better at competing with competitors, which is a win-win strategy.

5. Discussion

To sum up, this paper illustrates logistics, supply chain, and healthy competition among enterprises in the supply chain in simple language. Network information technology can effectively improve the logistics network mobility, and thus achieve the purpose of cost reduction, information sharing, and win-win cooperation, so that the problem can be solved in a more diversified way. Of course, no matter how large-scale logistics enterprises to a certain extent cannot avoid the financial, technical, commercial and other aspects of risk. These risks are mainly determined by the nature of the enterprise itself and the future transformation and upgrading. The strategic alliance of logistics network is dynamic, which can maximize the win-win strategy among enterprises, mutual benefit and maximize the benefits.

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