Mode of Agile Supply Chain Based on Competitive Intelligence

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ABSTRACT

Market competition has turned fiercer as customers’ demands keep on changing. In this environment, the competition among enterprises and supply chains, to a large extend, is a struggle for time and speed. Competitive intelligence would help enterprises to obtain competitive advantages of predicting, grasping and responding to customers’ demands agilely through environment monitoring, early warning and information actions in sequence, etc. In this paper, we put forward the competitive mode of agile supply chain based on competitive intelligence for the first time. The competitive mode mainly includes the subsystems of information collecting, information analysis, intelligence forecasting, and intelligence service. The application of competitive intelligence in agile supply chain strengthens the competitive advantages of agile supply chain by improving the service level on the aspects of speed and accuracy.

Keywords: agile supply chain, competitive intelligence, quick response, competitive mode

1. INTRODUCTION

The concept of supply chain originated from military logistics in 1980s and was initially brought forward by CALS (Computer Aided Acquisition and Logistic Support) plan of American Defense Department [1]. Generally speaking, supply chain manages acceptance of customers’ orders, purchase of raw materials, manufacture of products and products assignment to customers, making supplier, manufacturer, distributor, retailer and customers integrate together through flows of information, fund and logistics [2]. At the beginning of 1990s, along with the proposing of agile manufacture and development of dynamic alliance, supply chain was endowed with new meanings and requirements, and the concept of agile supply chain came into being [3].

Agile supply chain can be summarized as following: in a competitive, cooperative and dynamic market environment; in order to obtain the greatest benefits from quick response to customers’ demands; led by core enterprise; the supplier, manufacturer, distributor, retailer and customers are integrated together to form a seamless and dynamic chain with large competitive advantages. Agile supply chain should be designed in a suitable mode so that it can be reorganized and adjusted quickly according to the change of customers’ demands. Information technology has facilitated the development of agile supply chain. For example, Internet provides an efficient platform for information sharing among nodes of supply chain. The technology of Web service and Semantic Web would hasten the automatic process of supply and demand. On the aspect of predicting, grasping and responding to customers’ demands agilely, competitive intelligence would play an important role.

In agile supply chain, the enterprise that first grasps customers’ demands and responds agilely is usually regarded as core enterprise. The core enterprise can possibly be arbitrary supplier, manufacturer, distributor or retailer. In order to be ready to become the core enterprise at any moment, each enterprise might be supported by the platform of competitive intelligence. The rest of the paper is organized as following. Section 2 analyzes competitive intelligence and agile supply chain’s demand for competitive intelligence. In section 3, we put forward the competitive mode of agile supply chain based on competitive intelligence and make some analysis.

2. AGILE SUPPLY CHAIN’S DEMAND FOR COMPETITIVE INTELLIGENCE

2.1 Competitive intelligence

The variability of market environment together with the uncertainty of customers’ demands makes information become key factor in the survival and development of enterprises. However, what’s more important is the processing of information to obtain value-added knowledge and intelligence. Competitive intelligence is just the measure to make full use of information to achieve competitive advantages. It is the process of obtaining and analyzing competitive information from publicly available sources to help achieve the objectives of the organization. The term is often viewed as synonymous with competitor analysis but competitive intelligence is more than analyzing competitors—it is about making the enterprise more competitive relative to its existing set of competitors and potential competitors who are abstracted by customers and key external stakeholders [4]. Further more, competitive intelligence is the enterprise’s systematical, continuous, legitimate intelligence research on competitive environments, competitive rivals and competitive strategies in order to gain competitive advantages [5]. As a support technology, a platform of competitive intelligence could continually, orderly and systematically collect various of information

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related to the competitive power of the enterprise in a changing environment, then make real-time organization, analysis and forecast of the information so as to obtain competitive intelligence that is transmitted and utilized in the enterprise’s competitive activities.

The United Nations Industrial Development Organization (UNIDO) once made the following description in a document on the competitive intelligence: “For an enterprise, any change in exterior environment, including technical, economical and political factors, will possibly exert great influence upon the benefit and even survival of this enterprise. If the enterprise can discover and predict these possible changes by “reading” the early warning signals, it can have enough time to take corresponding measures in advance so as to not only avoid the threats but also seek new opportunities. Nowadays, this kind of ability becomes more and more important”[6].

2.2 Analysis of agile supply chain’s demand for competitive intelligence

The success of a competitive mode depends on whether it can get more competitive advantages serving better for the enterprise and creating more values for customers than the rivals or not. Agility is the biggest competitive advantage of agile supply chain and it directly influences the benefits of node enterprises.

Agility of agile supply chain mainly depends on time saving of node enterprises in the process of apperceiving customers’ demands, designing products, purchasing raw materials, making products, distributing products and so on. Saving time would bring the competitive advantages. Competitive intelligence would help enterprises to obtain this kind of competitive advantage through environment monitoring, early warning and information actions in sequence, and etc. So, competitive intelligence plays an essential role in agile supply chain.

2.2.1 Environment monitoring would enhance the agility of responding to customers’ demands

Here, environment monitoring is the comprehensive and persistent monitoring of the macroscopic environment related to the enterprise (such as political, economic, cultural, legal, technical, natural environment and so on) and the industrial environment (such as existing competitive rivals, customers, substitutes and so on). Modern market has gradually turned to a state of integration and globalization and the factors influencing customers’ demands have become more complex. To keep its legs in such a market, the enterprise must be sensitive enough to the diversification of customers’ demands. Through monitoring the market environment by collecting and analyzing the correlative information, competition intelligence would help discover customers’ demands and make correct countermeasures, thus enhancing the agility of responding to customers’ demands.

2.2.2 Early warning would acquire time to apperceive the change of customers’ demands

It cannot lead to a successful enterprise in the future only by quick reaction to current environment. Responding to the change of customers’ demands is only “defense”. No matter how quick and accurate, it is only a good “defense”[7]. In order to obtain further competitive advantages, the enterprise should forecast the changing orientation of customers’ demands so as to make preparation beforehand for the future. Through analyzing the correlative information, competitive intelligence system could mine the changing orientation of customers’ demands, and provide early warning signals to correlative departments of the enterprise, so that the relevant departments take corresponding measures such as constructing dynamic alliance or organizing agile supply chain in terms of the warning signals.

2.2.3 Information actions in sequence would facilitate seamless integration of agile supply chain

To realize its speed advantage, agile supply chain needs not only high sensitivity of node enterprises to the change of customers’ demands, but also seamless integration of itself. Competitive intelligence provides an efficient exchanging and sharing platform for information intercommunication among node enterprises in agile supply chain. The node enterprises can integrate all resources into a whole and optimize the operational process through the platform and channel. The node enterprises can adjust their own production and management through sharing intelligence on the competitive intelligence platform and promptly feed the adjustment back to the platform. Sometimes, the feedback will be of great value to the decisions made by other node enterprises. Information actions in sequence brought by competitive intelligence could effectively solve the problem of “bullwhip effect”, enhance the instantaneity and fluency of flows of information, fund and logistics, thus strengthening the seamless integration of agile supply chain.

3. COMPETITIVE MODE OF AGILE SUPPLY CHAIN

The enterprise would inevitably meet different kinds of environmental changes in its management, and there is no exception for agile supply chain. But if agile supply chain can take advantage of competitive intelligence in quick response to the change of customers’ demands, fast formation and highly effective operation of agile supply chain, it would run well in spite of the dynamic and instant changes in the environment. Competitive intelligence has enormous superiority in helping gain competitive advantages of agility due to its own extraordinary function of providing timely and accurate intelligence in decision-making support. If based on
credible intelligence service, agile supply chain can not only keep sensitive to the environment but also team up very well. Therefore, we apply the theory of competitive intelligence to agile supply chain and research into competitive mode of agile supply chain based on competitive intelligence in this section.

To some degree, implementing competitive mode of agile supply chain to obtain competitive advantages depends on a good platform of competitive intelligence. This competitive mode should be able to meet node enterprises' needs for timely and accurate information, for predicting, grasping and responding to customers' demands agilely, also it should be a public and integrated system built with functions of information collecting, information analyzing, intelligence forecasting, intelligence issuing and exchanging, coordinated work, overall optimization and decision-making support. Therefore, it should mainly include the subsystems of information collecting, information analysis, intelligence forecasting, and intelligence service. In Figure 1, we put forward the competitive mode of agile supply chain based on competitive intelligence platform.

The main function of information collecting subsystem is to collect correlative information inside and outside core enterprises such as customer information and environment information; the subsystem of information analysis is to process and analyze the information submitted by the information collecting subsystem. One part of the consequences produced by this subsystem is transmitted directly to intelligence service subsystem while the other part is submitted to the subsystem of information forecasting for later use; the main function of intelligence forecasting subsystem is to forecast the changes through the consequences provided by information analysis subsystem in scientific ways, so as to remind of node enterprises to take measures before the generation of customers’ demands; the intelligence service subsystem is mainly to form intelligence products (report or other forms), and to transmit them to decision makers of node enterprises for decision-making support. Business plan center is part of the platform of competitive intelligence.

The supply chain contains three node enterprises of supplier, manufacturer and seller (including distributor and retailer), and the customer. The core enterprise might possibly be the supplier, manufacturer or seller. Business plan center makes plan and assigns subtasks to supplier, manufacturer and seller. As the plan is supported by subsystem of intelligence service, the supply chain has the ability of predicting, grasping and responding to customers’ demands agilely. Therefore, the platform of competitive intelligence that could acquire time is the base to bring competitive advantages of time to agile supply chain.

3.1 Subsystem of information collecting

Effective information collecting is the foundation for agile supply chain to win in the fight for time. The function of subsystem of information collecting is to scan and monitor data pools of correlative information in various fields such as competitive environment, competitive tactics, competitor, as well as customer, product, logistics service according to periodic subjects.
of intelligence based on using effective methodology of information collecting and perfect network of information investigation. The information collected by different methodology must first be examined in order to eliminate the false and save the essence. Then, depending on the semantics, the subsystem recognizes the useful part of information, and works out the structured glossary of the key extracted characteristics. Following these preliminary organization and processing, are the structured glossary stored in data warehouse for the next step of analysis.

In order to realize the agility of predicting, grasping and responding to customers’ demands, when the information collecting subsystem is established and executed, more attention should be paid to the following three points. First, the establishment of this system needs full consideration of industrial characteristics of node enterprises and other influencing elements such as changes of national and global policies. Second, intelligence professionals should concentrate on collecting information according to periodic subjects of intelligence, rather than emphasize on the amount of information. The periodic subjects of intelligence needed by agile supply chain mainly contain the change of customers’ demands and information actions in sequence among node enterprises. Therefore, the subsystem of information collecting should place the keystone to the information that can affect customers’ demands and influence the effective operation of agile supply chain. For instance, customers’ demands will change due to the change of national policy, the development of network economy will hasten customers’ desire for obtaining products dynamically, and when supplier’s supply plan changes from long term to short or from short term to long, the production process of manufacturer will be affected. Third, intelligence professionals should collect information from the angle useful for decision-making, rather than from the angle of convenience. Otherwise, the later reports of information analysis may deviate from the true need of decision makers of node enterprises. So intelligence professionals should be trained by special method to learn to collect information from the point of decision makers and superintendents’ views and this is an important premise for supply chain’ quick response to changes of environment and customers’ demands.

3.2 Subsystem of information analysis

The platform of competitive intelligence should not only discover the information that has obvious value to node enterprises, but also excavate the unknown beforehand and latent valuable information hidden in massive information considered irrelevant or trivial. The information excavated often plays a vital role to the development of node enterprises in agile supply chain. Therefore, after collecting enough information related to the prearranged intelligence subjects, intelligence professionals would analyze the information with the considerations of every side and various influencing factors, then seek the intrinsic rule or relationship, and finally discover the hidden valuable intelligence. The function of information analysis subsystem is to combine the uncertain factors from external environment, to analyze and process the information submitted by information collecting subsystem using the technology or skill of intelligence work, to discover various kinds of omen intelligence, and to help the decision makers seize business opportunity.

To meet the requirement of quick response by agile supply chain, the subsystem of information analysis should based on traditional database but on the data warehouse that is subject oriented, integrated, contains historical data, and has relative stable data [5]. Through comparing historical and actual data stored in the data warehouse about market environment and customers, the information analysis subsystem discovers and explains the changes of customers’ demands, and chooses appropriate node enterprises to organize agile supply chain. Through analyzing kinds of information in production management of node enterprises in agile supply chain, the information analysis subsystem together with the intelligence service subsystem provides useful intelligence products to support decision-making.

3.3 Subsystem of intelligence forecasting

The responsibility of experts of competitive intelligence is to help leaders of enterprises clearly discern the future and win the future. Ava D.Youngblood who once served in American SCIP (Society of Competitive Intelligence Professionals) expounded the great value of the function of early warning provided by competitive intelligence [6]. Supported by the technology of data warehouse, OLAP (On-Line Analytical Processing) and data mining etc, the intelligence forecasting subsystem could realize the aim of refining out the deep useful pattern among a large number of data [8]. By reviewing the changes that has taken place inside or outside node enterprises, the intelligence forecasting subsystem detects the useful pattern such as the changes in the future and the tendency soon appearing. The “useful pattern” here is in fact a kind of intelligence about the future development of the node enterprises.

3.4 Subsystem of intelligence service

Intelligence service is the ultimate purpose of establishing the platform of competitive intelligence. The main function of the intelligence service subsystem is to set up various of analysis reports and other service forms (such as kinds of video products, literature reproductions, etc.) dynamically according to the hidden intelligence analyzed by information analysis subsystem and forecasted by intelligence forecasting subsystem. Then, according to the intelligence demand of decision makers and interrelated nodes in agile supply chain, these intelligence products will be transferred to them timely in promissory ways. The intelligence products in this
period include inner analysis reports of agile supply chain such as the analysis report on sensibility of the cooperation in agile supply chain, the analysis report on optimization of value chain, the analysis report on the condition of node enterprises’ production and management and outer analysis reports of agile supply chain such as the analysis report on external environment of competition, the analysis report on changes of customers’ demands, the analysis report on competitors and competitive intensity, etc. The agility of node enterprises’ response is promoted since in the course of serving, dynamic “push” mode has filtrated the irrelevant intelligence products [9]. Also, in the course of serving, this subsystem needs to carry on intelligence consultation with the decisionmakers repeatedly, in order to help the decisionmakers to put forward the rational and effective countermeasures.

4. CONCLUSIONS

In modern society, the market environment changes quickly, and the competition among supply chains turns gradually from the traditional competition strategy based on cost to the competition strategy based on time [10]. In this environment, in order to win in the fight for speed and time, enterprises must incept modern competitive notions that pay instant attentions to the changes of customers’ demands, and associate with other enterprises to form agile supply chain to cater to various demands [11]. The agility requirement of agile supply chain requests that node enterprises first adjust quickly according to customers’ demands, then respond fast to the changes of node enterprises during the operation of agile supply chain. The functions of environment monitoring, early intelligence warning and information actions in sequence provided by competitive intelligence can exactly satisfy agile supply chain’s request for agility. On the basis of competitive intelligence, enterprises could efficiently manage flows of information, fund and logistics in agile supply chain and respond agilely to customers’ demands. So, effectively applying the platform of competitive intelligence in the formation and operation of agile supply chain can promote the competitive advantage of agility, and assist enterprises and supply chain in succeeding in the fierce market competition. In this paper, we put forward the competitive mode of agile supply chain based on competitive intelligence for the first time and make some analyses, and this is our contribution.

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