

# Research on Supply Chain Collaborative Technology Innovation

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**Abstract.** In today's era, science and technology progress with each passing day, technology innovation ability for an enterprise, especially high-tech enterprises become increasingly important, become a key factor affecting the success or failure of enterprises. However, due to the constraints of their own resources and capabilities, individual enterprises are not always able to independently meet the requirements of technological innovation. Under the market conditions of rapid development of globalization and rapid changes of customer demands, collaborative innovation of enterprises points out a new direction for the development of enterprises. This article mainly discusses the related to supply chain collaboration technology innovation and so on has carried on the review, comparison of the advantages of supply chain coordinated relative to the horizontal collaboration, the influencing factors of supply chain collaborative innovation, supply chain collaborative partners shall comply with the conditions, finally summarizes the deficiency of previous studies and the direction of the future research can focus on.

**Keywords:** supply chain coordination; Technological innovation; Comparative advantage.

## 1. Introduction

In the era of knowledge economy, with the shortening of product life cycle and the acceleration of technology update, innovation has gradually become the key factor of the core competitiveness of enterprises. In terms of the word innovation, Joseph Alois Schumpeter believed that innovation was to establish a new production function, that is, to add a new combination of factors of production and production conditions that had never existed before in the production system.

For a long time in the past, many scholars did not have a deep understanding of technological innovation and believed that technological innovation was just a kind of technological behavior. With the continuous development of innovation theory, the research perspective of scholars on technological innovation has changed from simple to complex. Nowadays, most scholars believe that technological innovation is a whole process combined by multiple activities jointly participated by one or several organizations. Shengwu Jin and others believe that technological innovation refers to the process in which an enterprise obtains new technologies including product, organization, market and material innovation through its own or external forces in order to adapt to the changing technology and competition in the market environment. Different from the previous concept that technological innovation is classified into the field of technology by scholars, technological innovation should be a concept in the field of economics, because the ultimate purpose of technological innovation is to be applied in economic activities, and technological innovation includes the whole process from the generation of innovative ideas to the application of innovative achievements.

## 2. The Comparative Advantage of Supply Chain Collaboration Over Horizontal Collaborative Technology Innovation

Although collaborative technology innovation can make horizontal and vertical enterprises produce cooperative performance, it is not difficult to find from previous studies that enterprises in the supply chain are more effective and may carry out collaborative technology innovation compared with horizontal enterprises.

First, the main reason for the failure of collaborative innovation among horizontal enterprises is that enterprises maintain a dual relationship between competitors and partners. Therefore, during the period of cooperation, even if both enterprises try to learn the knowledge and skills of other cooperative enterprises, they will not fully participate in or participate in the innovative cooperation beneficial to the interests of the alliance out of concern for competitors, making the entire alliance fail to obtain the expected benefits and achieve the expected results. But companies in the supply chain can naturally avoid such situations.

Second, today's technological innovation requires the joint participation of all members. Every technological innovation achievement is the result of the joint efforts of all enterprises and the crystallization of the cooperation wisdom of all enterprises. Like a new energy vehicle, the biggest difference between new energy vehicles and traditional vehicles is the difference in energy supply mode, from traditional oil to electric, but the innovation of this supply mode requires the joint participation and innovation of enterprises in the supply chain. A new energy car is mainly composed by power plant, such as engine, motor, batteries and other energy device, as well as control system control unit to form, so before the final vehicles, need to various enterprises in the supply chain to field they belong to technical innovation, and finally to the integration of technology innovation, optimization of the enterprise.

Third, many studies have found that when the management of the overall collaborative technological innovation of the supply chain is at a high level, the positive effect of synergy on innovation will increase, and the overall effect of enterprises with more collaborative experience is better than those with less collaborative experience. Moreover, the overall effect of the alliance of enterprises with the same or similar knowledge or technology is better than that of the enterprise alliance without this advantage.

Fourth, knowledge transfer efficiency among organizations is low, so the technological differences of collaborative partners may have a negative effect on collaborative innovation. Differences in culture, management mode and knowledge technology between different enterprises will become barriers to the flow of knowledge between enterprises. As the supply chain synergistically promotes information communication and cultural interaction between upstream and downstream enterprises, it improves the communication ability and efficiency of technical knowledge among enterprises and reduces the barrier of knowledge and skill communication between enterprises.

Fifth, in the short term, partners established for the purpose of developing and building core technology competitiveness rarely achieve the expected results. This is because the core competitiveness needs a long time to build, so the short term alliance is natural lack of this condition. In terms of the formation and development of supply chain, it is not difficult to find that the long-term running in and cooperation between enterprises is the prerequisite for its formation. Upstream and downstream enterprises are communities of interests for a long period of time, so the supply-chain-based collaborative innovation has a significant role in promoting the development of core competitiveness of enterprises.

### **3. The Cooperative Partner Selection of Technology Innovation of Supply Chain**

#### **3.1 Influencing Factors of Collaborative Partner Selection for Supply Chain Technology Innovation**

Cooperative technology innovation requires multiple enterprise in the supply chain partners to participate in the implementation, participate in collaborative innovation of supply chain members levels of knowledge, skills, abilities and contribution to the process of its innovation, technological innovation is supply chain has important influence on the outcome, therefore, finding the right partners for cooperation is the key factor in supply chain collaboration is expected results. In the process of supply chain collaborative innovation, it is the key factor that the resource capability of enterprises participating in technological innovation can match with each other.

## **3.2 Supply Chain Technology Innovation Collaborative Partner Selection Process**

### **3.2.1 Opportunity Estimation**

This is the starting point for establishing supply chain synergy. Mainly includes, widely collect information of partners and the need of society, after the analysis of information processing, the evaluation of supply chain collaboration enterprise technology innovation ability, will face the opportunities and threats, the necessary and possibility of success, clear up the supply chain coordination of enterprise's market position and to deal with the uncertainty of the factors, and the future of supply chain cooperative technology innovation of preliminary evaluation.

### **3.2.2 Determine Objectives**

To properly evaluate the future situation after, you need to specify the coordination of supply chain enterprise future goals, including the determination of the overall objectives, main points of the goals in the process of decomposition, target and the process of quantification in order to determine the target value, should also be clear between supply chain collaborative enterprises during the period of division of labor, contribution, income distribution and cost sharing, knowledge sharing level and so on.

### **3.2.3 Determine the Premise**

The premise to determine the collaborative technological innovation among supply chains is to predict the environment that the supply chain will face in the future. Although the market environment in the future changes rapidly, it often follows certain rules. Therefore, reasonable estimation of the overall environment of the future supply chain needs the joint participation of enterprises. In order to maintain the long-term partnership between enterprises in the supply chain to carry out technological innovation, the premise should be determined by selecting the factors that have important and decisive influence on the collaborative innovation activities between enterprises.

### **3.2.4 Object Determination**

After determining the criteria for collaborative partner selection, collaborative enterprises in the supply chain are determined in accordance with rules, standards and principles. The matching between cooperative partners refers to the similarity and complementarity of supply chain cooperative enterprises in resources, technologies and other aspects, and the difference between the strength and weakness of cooperative enterprises is not very obvious, which affects the fairness of cooperation. For example, li cuijuan et al. found that if the status of the two parties is not equal, the weak party often suffers from poor skills and consciousness, which leads to the fact that their own benefits fall short of the input and gains fall short of the loss, failing to give full play to the synergistic advantage of the supply chain and making their position worse.

### **3.2.5 Evaluation Objects**

After determining partners, need to periodically evaluate the supply chain collaboration partners, assess its really meet the need of the development of supply chain for a long time, to enhance the contribution of the overall value of supply chain, the evaluation standard can be produced benefits of supply chain collaboration technology innovation evaluation, according to the standards set by the evaluation before its value. If the value created by the supply chain partners as a whole meets or is higher than the standard, it is believed that supply chain collaboration is effective for technological innovation, and enterprises in the supply chain can continue to cooperate to create greater value. If the value created does not reach the expected goal, the resources or partners invested in collaborative technology innovation should be considered.

## **4. Summary**

Globalization permeated various fields of the market, the market competition becoming increasingly fierce, in order to short production cycle, simplify production process and better meet the needs of the customers, all companies are stepping up to speed up their own innovation ability

raise, to constantly improve themselves in the position of the market, and market influence. However, due to the limited resources and capabilities of individual enterprises, they often cannot meet the requirements of their own innovation. In order to break away from the predicament of enterprises themselves, it has become a key concern of enterprises to seek suitable external partners for technological innovation. Compared with previous horizontal collaborative innovation, vertical collaborative innovation has many advantages and makes up for the disadvantages of traditional horizontal collaborative innovation, so it is more and more accepted by more enterprises.

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