

# Research on enterprise supply chain management from the perspective of information sharing

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**Abstract:** Supply chain management is an integration to the maximum extent of all kinds of internal and external resources, so as to satisfy the customer, reaching the optimal goal of operating with the least expenses. The sharing and integration of effective information among enterprises can ensure the sound development of the whole supply chain, improve product quality and service capability, and strengthen the overall market competitiveness. Under the new era background, though Chinese firms has obtained commendable achievements and results from information sharing perspective, numerous subjective and objective problems are still confronting in realistic practice. This paper mainly starts from the three modes of information sharing mode, summarizes the important problems of information sharing barriers and information sharing security risks in enterprise supply chain management, and finally puts forward the optimization strategy of enterprise supply chain management, in order to promote the development and innovation of enterprise supply chain management in the new era.

**Keywords:** Information sharing; Supply chain; Existing problems; Optimization strategy

## 1. Introduction

Under the new market circumstances, supply chain management is an effective method of improving competitiveness and performances of firms and supply chain is established to strengthen co-operations between firms. Therefore, it is necessary to ensure information sharing in supply chain management and collaborative operation of supply chain depends on the high-quality information transmission and sharing of every node and hence if firms want to optimize supply chain management, they need to conduct from the information sharing perspective.

## 2. Basic overview of information sharing mode

### 2.1. Point-to-point information sharing mode

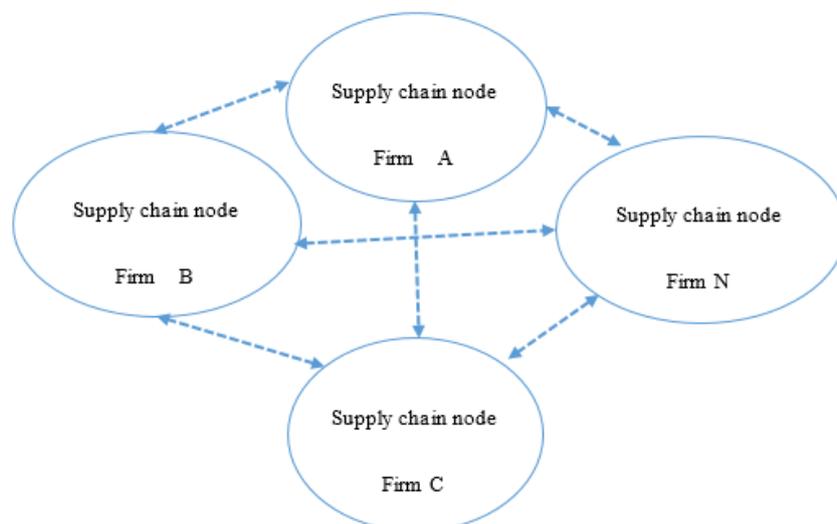


Figure 1: Point-to-point information sharing mode

In the point-to-point information sharing mode, the enterprises in the supply chain share information through each other's information system, and realize the many-to-many information sharing and access when both sides have direct demands. As Figure 1 shows, this mode has the characteristics of easy information sharing, clear transmission and high single transmission efficiency. However, because there is no unified management standard, it can only be carried out in pairs. If there are a large number of firms in the supply chain, the repeated transmission of data will lead to information distortion and efficiency reduction. When different enterprises receive different information, it is difficult to form a unified understanding and cognition, thus affecting the overall synchronization.

## 2.2. Third-party platform sharing mode

The third-party platform sharing mode relies on third-party provider to establish and maintain the technical support and equipment, and develops corresponding functional modules which aim at the demands of firms. In terms of inter-enterprise information management, authorization is different between enterprises. Long-term strategic partners can get more authorization, while temporary and short-term trading partners can get less authorization, so as to prevent secret information leakage within the supply chain. This mode improves the consistency and fairness of information exchange between enterprises and reduces the frequency of distortion. In terms of security, because it involves the management of a third party, information may be leaked once the cooperation is terminated, so it is necessary to select a supplier with good trust in information service.

## 2.3. Comprehensive sharing mode based on enterprise information platform

This mode is generally managed by core enterprises. Enterprises are like a small network in the supply chain. They can use their authorization to carry out point-to-point communication and sharing on a public platform or within the company, which maximally ensures the correctness, security and accuracy of information, minimizing the distortion of information and maximizing the efficiency and coordination of integration. At the same time, the construction cost of the enterprise also increases correspondingly, which increases the management cost of the core enterprise. Thus, this model is suitable for the stable supply chain structure. The structure is shown in Figure 2.

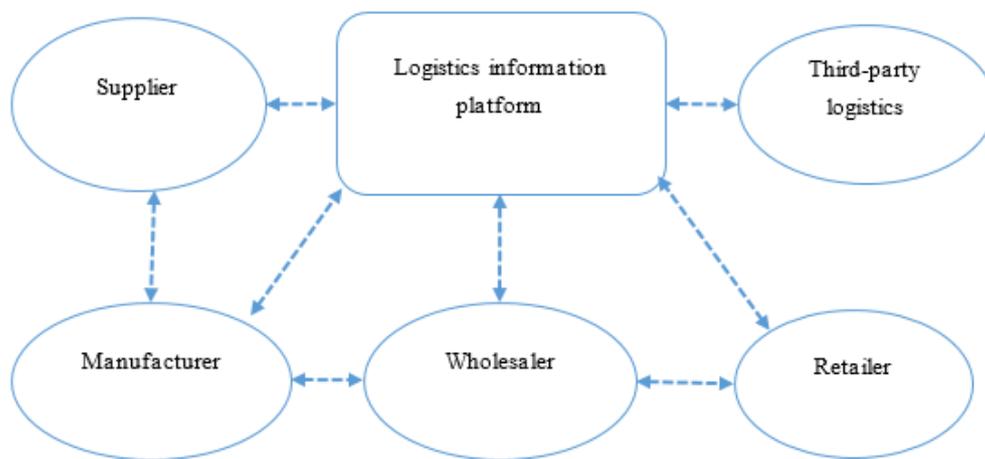


Figure 2: Comprehensive sharing mode based on enterprise information platform

## 3. Existing problems in enterprise supply chain management based on the perspective of information sharing

### 3.1. Obstacles to information sharing

The first is that information sharing is limited by cost. Although information sharing can play a certain positive role, such as eliminating the bullwhip effect, it is also costly. In order to realize information sharing effectively, it is necessary to invest in various aspects. On the one hand, a large

amount of funds should be invested in the construction of information platform; on the other hand, the early training and daily maintenance of equipment also need certain financial support. Even with the most advanced technical support, it requires a lot of manpower, material and financial resources.<sup>[1]</sup> Taking logistics EDI as an example, shippers and other units can use this system to exchange information, so as to achieve information sharing. However, the biggest problem encountered in practical application is high operation cost and high execution cost. When decisions are made, the costs of sharing information are weighed against the benefits. The second is the obstacle of unequal benefits. Information sharing can promote the profit growth of the whole supply chain, but not all nodal enterprises have profit growth. The main body of information sharing is downstream enterprises, while profit growth is concentrated in the upstream. Since each enterprise has its own interests, if the total income cannot be distributed to each enterprise, it will inevitably cause some enterprises to boycott, which will lead to the breakdown of the cooperative relationship. At the same time, if the downstream manufacturer provides its private information to the upstream manufacturer, it will strengthen its authority in the supply chain, thus making the downstream manufacturer at a disadvantage in the negotiation and thus losing its profit advantage. In the process of contract formulation, the information-dominant party has a greater say and can affect the interests of information-sharing enterprises by reducing the order or raising the supply price of suppliers. The third problem is the prisoner's dilemma. In this case, both supermarkets and suppliers will choose not to cooperate in order to get the maximum profit. In reality, no matter between enterprises or between enterprises and suppliers, the above situations will occur. Due to the opaque information between suppliers, wrong decisions will be made. For example, enterprises cannot accurately identify the ability of suppliers, which leads to the problem of reverse selection, and suppliers' fraudulent behaviors after signing contracts. At the same time, in order to pursue their own interests, the fierce competition within the industry will hinder the sharing of information, and even cause the appearance of false information.

### ***3.2. Security risks of information sharing***

The first is the risk of excessive information-sharing. The management of suppliers in the supply chain will produce excessive information sharing, which will affect the credit of enterprises. Excessive information sharing will cause mutual suspicion among enterprises, and they are afraid to disclose their information to competitors. The degree of such risk depends on the importance of the information content provided, while the probability depends on the degree of information sharing and the level of confidentiality provided. The second is the risk of insufficient information sharing. When conducting inventory management, suppliers need to have sufficient information support. If the shared information is not sufficient, it will affect the supplier's accurate grasp of inventory, thus affecting the accurate control of inventory, resulting in a weak supply and demand relationship in the supply chain, and thus reducing the competitiveness of enterprises. The risk depends on the type of information shared, and the probability depends on the degree of information sharing.

## **4. Optimization strategy of enterprise supply chain management based on the perspective of information sharing**

### ***4.1. Optimization strategies of information sharing barriers***

First, speed up the standardization of information sharing. In supply chain management, the standards of information sharing are: standardization of information, unity of name, unity of definition, standard of format, and mutual relationship of information. Information processing process should be standardized, information processing should follow certain rules; According to the unified database and management transaction processing standards, each enterprise based on the information provided by the unified database management decisions, in order to achieve the overall business objectives. The second is to establish a profit-sharing mechanism. As the core of the supply chain, enterprises must establish the incentive mechanism of benefits, costs and risks according to the information sharing between enterprises, so as to promote the information exchange between enterprises and prevent the vicious competition between enterprises.<sup>[2]</sup> According to the information provided by the upstream and downstream enterprises, the core enterprises can make different prices according to the information provided by them, so as to provide corresponding price compensation for them.

#### ***4.2. Optimization strategies for security risks of information sharing***

The first is the control of excessive risk of information sharing. Excessive concentration of information resources in the supply chain leads to excessive risks in information sharing between enterprises. Therefore, enterprises must strengthen the security and prevention of information technology, and use advanced information technology to achieve mutual trust between enterprises. If credit files can be established, their credit records can be put on record, and the credit relationship between enterprises can be improved. The second is to control the risk of insufficient information sharing. Develop a good coordination relationship. If the information in the supply chain cannot be fully shared, the loose supply chain will be caused, especially in the downstream, where the information is insufficient, there will be greater risks. In this case, the supply chain should have a good coordination ability, to stabilize the supply relationship, to reasonably resolve contradictions, especially to play a leading role at key moments. The third is the rational allocation of interests. The profit distribution of an enterprise is related to its contribution, and in the process of information sharing, the more information shared, the greater its contribution, and in order to enable enterprises to share more information, it is necessary to give more profit distribution.

#### ***4.3. Incentive countermeasures for information sharing***

The first is to implement price and order incentives. Pricing incentive is a price differential policy aiming at different enterprises on the same node. Instead of treating all companies equally in the past, we will impose pricing restraint on companies that do not want to share or share little information. For the companies that share the most information, the incentive pricing mechanism is adopted to make up for the loss of benefits of this group, realize the reasonable distribution of profits, and stimulate the willingness of enterprises to share information. Now many domestic companies will decide the quantity of the next order according to the completion of a deal. In this way, suppliers can share more real and sufficient data with corresponding companies in the next cooperation, so as to achieve better incentives. The second is equity incentive. Equity swap incentive means to exchange shares with other enterprises in the supply chain on the premise of not affecting the shares of the enterprise, so as to achieve better profit distribution and improve the trust of the enterprise. At the same time, the enhancement of mutual trust will also promote mutual trust in information sharing, thus realizing mutual benefit of information and forming a virtuous circle. In the supply chain, benefit redistribution can effectively improve the profit balance of enterprises and fundamentally solve the biggest obstacle to information sharing. CNPC and SINOPEC have swaps and equity purchases with oil-exporting countries to gain access to more information and quotas. The third is goodwill incentive. Goodwill is a kind of intangible assets of enterprises, which reflects the status and reputation of enterprises in the industry and society, and plays a decisive role in the market share and market expansion of enterprises. Large multinational companies such as Walmart and Dell will give them a certificate of excellence and recognize them in other channels. From the perspective of agents, agents should do their due diligence, take the initiative to share relevant information with core enterprises, and promptly communicate with them once problems are found, so as to promote agents to establish a reputation in the market and gain market share more easily. Fourth, formulate unified standards and supervision and evaluation systems. In order to prevent information distortion and improve transmission efficiency, the supply chain must establish a unified standard that everyone can follow. Upstream and downstream enterprises should carry out unified information sharing according to this standard, reduce information errors and distortions, and ensure the fairness and transparency of information.<sup>[3]</sup> At the same time, establish a monitoring and evaluation mechanism to penalize companies that do not cooperate to ensure the interests of the entire supply chain.

### **5. Conclusions**

In short, information sharing in the supply chain is related to the information of many levels and links of various enterprises in the whole supply chain. Therefore, it is a very difficult work to obtain all the information of all links in the supply chain and to share and integrate the information. Only under the strict monitoring and restriction of the market mechanism can the credit of enterprises be reconstructed, and a scientific and reasonable incentive mechanism of benefit sharing and risk sharing be established, so as to effectively share the information among the major enterprises, effectively improve the operation efficiency of the supply chain, and further promote the effective integration of resources in the whole supply chain.

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