# Research on the Strategy of Intelligent Supply Chain Management in International Transportation Enterprises

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**Abstract:** This paper studies the strategy of intelligent management of international transportation enterprises from the perspective of supply chain management of international transportation enterprises. This paper studies the over-cutting, necessity and sufficiency of intelligent management strategy requirements of international transportation enterprises. The technical route of humanization and modularization is put forward. Based on these technical routes, relevant research is carried out, and the strategy method of balancing economy and technology is put forward. It also points out the specific methods and requirements of intelligent supply chain management in international transportation enterprises. And the corresponding assessment methods are studied. It provides a whole scheme for related enterprises to realize intelligent supply chain management.

Keywords: International transport enterprise; Intelligent management; Supply chain; Humanization; Modularity

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# **1. Introduction**

At present, the international transportation enterprises are showing the trend of group group. Many transportation enterprises combine with other enterprises to achieve strategic alliance. Japan's three biggest shipping companies have merged. China's two largest shipping companies have also merged. The merger of these large shipping enterprises represents the development of a kind of management thinking. That is bigger and stronger, integrated management. Extend the service capabilities of large enterprises to relevant areas. Achieve horizontal and vertical integration. In this way, international transportation enterprises have basically adopted the supply chain management model. With the development of artificial intelligence, fast intelligent management methods are popular in large transportation enterprises. International transport enterprises themselves have a better level of information management. However, international transportation enterprises generally pay attention to transportation management, and other supply chain management business related to transportation is less involved. The ideas and methods of supply chain management have a good application effect for international transportation enterprises. However, the intelligent supply chain management method is still in continuous development and exploration. The implementation of intelligent supply chain management in international transportation enterprises generally has several difficulties. The first difficulty is that international transport enterprises have no experience in supply chain management. The second difficulty is that international transport enterprises do not have a good intelligent management information system. The third difficulty is that it is difficult for international transportation enterprises to achieve modular supply chain management with upstream and downstream enterprises in the supply chain. At this time, international transportation enterprises need to consider strategic issues in the implementation of intelligent supply chain managers.<sup>[1]</sup>

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# 2. Strategic Demand for Intelligent Supply Chain Management of International Logistics Enterprises

#### (1) Technical strategies for implementing intelligent supply chain management

The implementation of intelligent supply chain management in international transportation enterprises generally requires that the associated enterprises have a good information foundation. Generally speaking, international transport enterprises have a good information management foundation. Once supply chain management is realized, the informationization level of upstream and downstream enterprises in supply chain becomes an important factor restricting enterprise informationization management. In other words, although the informatization level of large enterprises is very high, the informatization ability of supply chain management is low due to the lack of informatization ability of other related enterprises. Therefore, many enterprises in order to achieve intelligent supply chain management, put forward a series of information standards and requirements. In this way, the information basis of supply chain management has a technical standard. The unification of technical standards and the formation of rules provide a common technical guarantee for each supply chain node enterprises to implement intelligent construction. The unification of technical standards and the coordination of technical capabilities provide the basis for the information-based and efficient operation of supply chains. Also for intelligent supply chain management. The technical basis is provided. At this time there is a practical problem, the first to achieve information. Enterprises are often not the leading enterprises in the supply chain, once integrated into the supply chain management, the original information management system may be abandoned. In this way, the sunk cost of these enterprises in the process of informatization becomes a problem of technical economics. Some enterprises implement a high degree of informatization and intelligence, and the sunk cost is very large, which leads to a decline in the enthusiasm of integrating into the intelligent supply chain. In other words, the earlier the supply chain node enterprises implement information engineering, the higher the sunk cost of technical investment is often. After participating in the intelligent construction of supply chain enterprises, there is no technical sunk cost. This leads to a paradox in the incentive of technology investment. This leads to a natural resistance to the rapid formation of intelligent supply chains. This resistance comes from technological investment. But the strategy is a matter of economics. It involves the main content of game theory and information economics. Once the initial investment of supply chain enterprises in informatization construction changes from sunk cost to effective cost, the empirical negative incentive will change to positive incentive. This is also an important purpose of the author's study. The technical strategy of intelligent supply chain management must follow the laws of game theory and information economics. Let the rules become the promotion role of promoting enterprises to increase information construction and investment, rather than letting enterprises wait and see each other. The technical standards of supply chain intelligence should be formulated by the first few enterprises that initiate supply chain management. In this way, the sunk costs of these enterprises can be effectively solved. After joining the large enterprises if they want new technical standards, they must have sunk costs with the initial investment of the wind beach. This creates a sunk cost sharing mechanism. In this paper, the allocation mechanism of sunk cost is proposed to solve the problem of negative incentive in technology input.<sup>[2]</sup>

#### (2) Implement flexible strategies for intelligent supply chain management

An important purpose of intelligent supply chain management is to adapt to changes in the external environment in time. Through the rapid changes within the supply chain, we can adapt to the drastic changes in the external environment. At this time, the ability to change within the supply chain is an important factor in supply chain management. This transformative capability requires a comprehensive supply chain of resources and capabilities. The capacity of resources in the supply chain is diverse and requires intelligent scheduling. The intelligence of this kind of scheduling is mainly reflected in the optimization of capability scheduling. Scheduling optimization has two main dimensions. One dimension is the intelligent collection of scheduling information. Another dimension is the intelligence of the scheduling algorithm. Both of these dimensions are intelligentized to achieve scheduling optimization. The ability of the supply chain to quickly adapt to external changes reflects

the flexibility of the supply chain. The intelligent application directly serves the flexible strategy of the supply chain. In the past implementation of the flexible strategy of supply chain, the main obstacle is the insufficient level of intelligent management of supply chain. Two trends of intelligent and flexible supply chain optimization management. The two trends are characteristic of matching. Flexible management needs have produced specific demands for intelligence. The intelligent management method provides technical and management guarantee for the flexible supply chain management.<sup>[3]</sup>

Flexible supply chain management urgently needs intelligent information system. The original common enterprise information management system can not adapt to the flexible supply chain management. This is mainly because the traditional information management system is not dynamic in data collection. Individual dynamics is mainly the dynamic setting of data collection points. The dynamic setting of data collection points needs to adjust the setting of data collection points intelligently according to the change of supply chain management. The setting of dynamic data collection points is the technical difficulty of flexible supply chain management. The dynamic data collection point setting is the development trend of intelligent supply chain management in the future. The intelligent data collection point is what the current enterprise technology and management level can achieve. Dynamic and intelligent setting of intelligent data collection points is difficult to achieve for most enterprises at present. In other words, the fixed setting of intelligent data collection points is relatively mature in technology and management. At this time, the construction of supply chain management information system can adopt the traditional idea of information management construction. Compared with the traditional enterprise information system construction, the construction personnel mainly rely on experience. Now the construction of intelligent information system mainly relies on intelligent technology. In other words, intelligent information systems often rely on intelligent construction methods and means, and the implementation of construction has shifted from engineering and technical personnel to intelligent tools. In this way, the construction of intelligent supply chain information system, but gradually get rid of the dependence on traditional engineers and technicians.<sup>[4]</sup>

The strategy of flexible supply chain is firstly the intelligentization of information system construction. The goal of information system construction is also intelligence. The process and means of construction are intelligent. In this way, the intelligent level of enterprises has become a prerequisite for the implementation of flexible supply chain strategies. The intelligence level of all node enterprises in the supply chain constitutes the intelligence level of the whole supply chain. Therefore, if some enterprises on the supply chain have a large lack of intelligent management level, it will affect the intelligent construction of the entire supply chain. This is, a quick emergency method is to let the core enterprise weak enterprise information management. That is to say, the core enterprises can play their own intelligent advantages, directly lead and manage the weak enterprises. Information construction. At this time, the construction of intelligent information system has become the responsibility of the core enterprise, and it is also the basic driving force for the core enterprise to develop the supply chain capability. The level of intelligent core enterprises will become the benchmark of intelligent supply chain construction. The standard of supply chain intelligence is actually dynamic. With the change of business model and the development of information technology, the core enterprise management ideas are constantly changing. The change of management ideas and the development of information technology lead to the development and change of supply chain management model. The management idea of flexible supply chain is also deepening and developing. Flexible supply chain information management technology continues to develop. There are four important supporting points for the development of information management technology. The first support point is the managers' ability to recognize enterprise informatization. The second support point is the ability of employees to accept information management work. The third support point is the economy of enterprise informatization and intelligent applications. The fourth pillar is the attitude of the government and the public towards intelligent work. These four support points are very important for enterprises to develop intelligent business management. Historically, many enterprises have failed in the process of implementing management informatization and intelligence. Most of these failed cases have problems and defects in the above 4 supporting points.

Flexible supply chain management strategy has formed new challenges for the four supporting points of information work. Because of the dynamic nature of supply chain management, the intelligent level of flexible supply chain has become the bottleneck of supply chain information construction. Some supply chain management is normal management, less dynamic, and the chain length of the supply chain is also short. At this time, the node enterprises have strong information matching ability, and can realize unified information standards among each other. The international experience management usually needs to deal with the dynamic external environment, which leads to the urgent need for dynamic supply chain management in the international supply chain. At this time, supply chain management should adapt to the complex economic and legal environment at home and abroad. The dynamic management of international supply chain is very difficult. The external environment of international supply chain has a strong problem for the construction of intelligent information system of supply chain. Because domestic and foreign and information construction requirements are different. Domestic and international information and intelligence confidentiality requirements are also different. Many foreign communication software cannot be used in China. Similarly, many communications software in China does not work properly in the United States or other countries. This leads to the transnational supply chain in the information construction. Natural difficulties. At this time, the flexible supply chain construction scheme can better overcome the technical barriers. This is also one of the important advantages of flexible supply chain strategy.<sup>[5]</sup>

#### (3) Implement the modular strategy of intelligent supply chain management

Intelligent supply chain because of the need to deal with the business and data is relatively large, and even can be called a massive data. Just use a modular strategy to simplify the processing of business and data along the supply chain. Modularity can simplify the construction of the entire system in intelligent construction. The construction of each module is relatively independent, with good autonomy and independence. The modular intelligent supply chain has a relatively short construction cycle. And there is parallel fault tolerance between each module. Intelligent supply chain requires a certain degree of robustness and fault tolerance. Because the entire intelligent supply chain system is extremely large, it needs to activate the enthusiasm and autonomy of each module. From the perspective of management incentive mechanism, modularity. The supply chain intelligent system has strong parallel function and can realize the characteristics of construction and use. The efficiency and effectiveness of economics are related to the design rules of technology. The design of technical rules should be based on economic considerations. But the basis for both technical and economic measurement is dynamic. This is the difficulty in designing an intelligent supply chain. Modularity technology can abstract and simplify the application of data. This simplification has a certain degree of similarity in theory, and can achieve better similarity in most cases. Modular processing is not optimal, but it is feasible. This technical similarity has good economic value. In other words, among various feasible technical solutions, modularity has better economy. This modularization can be constructed from two aspects: resource modularization and capability modularization. Based on modularity is the basic work. Capability modularization is a higher stage of development. Intelligent supply chain is further developed on the basis of the original supply chain management. Capability modularization has become an important development direction of intelligent supply chain management. Capability modularization is the core of virtual logistics application. In the aspect of intelligent supply chain, the application of virtual logistics has been developed, and the integration of social resources has been better realized. To quickly form the core competitiveness of enterprises, one of the main purposes for enterprises to participate in intelligent supply chain. Modular management can realize this management goal of some enterprises.

#### 3. Strategy Analysis of Intelligent Supply Chain Application in Transportation Enterprises

#### (1) Necessity analysis of the application of automated supply chain in international transportation enterprises

Transportation enterprises are currently facing the constraints of global supply chains. The constraints of global

supply chains have an important feature, that is, they are dynamic and uncertain. In theory, the constraints of fastchanging globalization have many unforeseen trends. Such uncertain constraints are difficult to deal with through ordinary supply chain management. And intelligent. Supply chain management has automatic adaptability to the external environment. This automatic adaptability comes from two aspects, one is the intelligent and rapid collection of external information, and the other is the intelligent and rapid adjustment of external changing information. The intellectualization of these two aspects directly solves the problem of uncertainty of external constraints. This is also the necessity for logistics enterprises to adopt intelligent management.

#### (2) Path analysis of intelligent supply chain application in transportation enterprises

The application of intelligent supply chain in transportation enterprises is generally based on the core enterprises. This is the logical starting point for intelligent supply chain applications. Well, this benchmark starts to design the rules that govern intelligent supply chains. This management rule includes the management contract relationship between enterprises and the management information base rules. Once the rules of these two aspects are accepted by all enterprises in the supply chain, intelligent supply chain management has its own management framework. Under this management framework, we make full use of modular technology to carry out process reengineering for all enterprises. When the work of enterprise process reengineering is basically completed, the efficiency and effect of intelligent supply chain management will have the basis for implementation. The efficiency and effectiveness of supply chain management can also be evaluated by both qualitative and quantitative aspects. When the assessment results of the efficiency and effectiveness of supply chain enterprises can be realized. At this time, intelligent supply chain is feasible and controllable for transportation enterprises. This is the basic formation of the path for the application of intelligent supply chain in transportation enterprises.

### 4. Conclusion

In the complex and changeable external environment, international transport enterprises urgently need a management mechanism that can quickly respond to external changes. This kind of management mechanism needs to be realized through intelligent supply chain management. Once the supply chain management is intelligent, international transportation enterprises will have the ability to respond quickly and effectively in participating in global business work. This ability to cope is based on a new process reengineering effort. The establishment of intelligent supply chain has good efficiency and effect for international transportation enterprises. And. This effect can be measured. Therefore. Intelligent supply chain management is of great practical significance for transportation enterprises.

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