

## Research on Cooperative Technology Innovation of Logistics Service Supply Chain

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**Abstract.** Under the guidance of the theory, a comprehensive commentary on the current situation at home and abroad, from the synergy targets, collaborative body, collaborative environment, collaborative relationship between the angle of the service supply chain logistics influencing factors are analyzed and presented on the basis of lack of trust of each node enterprise, vendor selection inappropriate, inadequate crisis management, task allocation unreasonable question, proposed the establishment of trust mechanism, optimizing supplier selection processes, improve crisis management capabilities, task allocation process is recognized programs to improve strategies to this end of this article, hoping to promote future development of collaborative operation of logistics service supply chain.

**Keywords:** Logistics Service Supply Chain; Supply chain coordination; Synergy targets; Synergies.

### 1. Introduction

The collaborative supply chain is a hot research field of supply chain management, but most of the current studies focus on products supply chain in manufacturing or retail business as the leading. But in actual operation, especially under the environment of e-commerce in the enterprise operation, there is a transfer of logistics service products supply chain model -- logistics service supply chain. It refers to the process of providing professional logistics services, supply and demand structure of chain enterprises from the earliest functional logistics service provider to integrated logistics services to the end customer formation. Among them, the dominant logistics service integrator. Logistics service supply chain coordination refers to the logistics service supply chain is established, in the course of the operation of the logistics project, each member of the supply chain dynamic resource sharing, for a variety of business activities of mutual dependence between management and decision-making of integration, to improve the overall performance of each member of the supply chain and the supply chain goal. It is not only a kind of management behavior, is a kind of cooperative, harmonious state. Coordination is the core of logistics service supply chain operation and development, understand and grasp the essence of collaborative logistics service supply chain and cooperative mechanism, for logistics service supply chain construction, operation and management to provide ideas and direction.

Research on logistics service supply chain technology innovation, need to carry on the analysis from the downstream demand side and supply side upstream, on the demand side, the main embodiment can obtain a large demand for industrial customers in logistics service supply chain technology innovation, maintain consumer lower search cost. In addition, in the process of innovation of a good innovation idea is communication and interaction between users and suppliers from logistics service in the supply chain.

Technology innovation is not a kind of recessive knowledge coding, knowledge, people need through frequent face-to-face communication to transfer.

## **2. Logistics service supply chain technology innovation synergy effect factors**

Logistics service supply chain technology innovation synergy refers to the logistics service supply chain (LSSC) between enterprises make full use of modern information technology, communication and coordination and management, from the functional logistics enterprise to integrated logistics enterprise, and then to the whole process of the customer, information sharing, overall optimization of each node enterprise, so as to achieve the lowest, the whole chain cost-effective, and ultimately achieve the overall income maximum process. Therefore, cooperation between the nodes enterprises will be crucial, particularly important influence factors of collaborative research between the node enterprises.

### **2.1 Cooperative target**

Collaborative goal should be to every node expects to achieve the result of collaborative target including the overall and individual objectives. The overall goal is the common goal of LSSC cooperation. In general the common goal of collaborative LSSC is efficient, high level of implementation of LSSC operation and healthy development, to maximize the synergy degree. Including reduce operating costs, improve service levels, increase the income of the enterprise, raise the utilization rate of resources, reduce operating risk, enhance the competitiveness of enterprises, expand the market scope. For each node, individual targets in coordination are which cannot be realized in order to obtain the benefits of separate operation.

### **2.2 Collaborative subject**

Cooperation main body namely LSSC on each node. LSSC is a node member symbiosis society ecosystem cooperative node, its members include: the logistics service demand that is the source power promote the development of logistics activities generated; provider of logistics services, including integrated logistics business and functional logistics business. Integrated logistics business through planning, integration and management of LSSC resources, technology and capacity, organization and coordination of logistics service operations from the global, usually integrated logistics business is the core of LSSC. All kinds of professional logistics enterprises functional logistics companies that implement specific logistics activities, such as transport fleet, warehousing company, distribution companies; the final service users, namely logistics final service object. Logistics service supply chain is a chain link, it will be all the node enterprises through the common goals and interests effectively together, it includes integrated logistics business, functional logistics providers, clients and other enterprises, and these enterprises of logistics service supply chain collaborative process each link of the processing capacity and bad environment the coping ability have important influence on the whole process of collaborative, a good node enterprises can effective collaborative effectively drive the whole logistics service supply chain.

### **2.3 Collaborative environment**

Collaborative environment is set for the synergy effects of the substance, energy, information and other things exist in the outside of the LSSC system, such as a variety of political, economic, legal, social systems, natural and social cultural environment, the level of economic development, science and technology, energy and transportation, logistics industry, logistics industry development level structure. Between the main body and the environment coordination ongoing material, energy, information exchange, mutual influence, interaction. The environment for the influence of LSSC, not only positive but also negative aspects, therefore, should be good at making full use of positive factors of environment, effective coordination to promote the LSSC, also want to pay attention to take the appropriate ways and means, as far as possible to avoid the environment for the development of LSSC collaborative effect, but also pay attention to the collaborative environment is not immutable and frozen, so be ready to deal with various situations ahead. Between the main body and the environment coordination ongoing material, energy, information exchange, mutual influence, interaction. A good environment to promote the role of collaborative, bad environment has effects on the cooperation, how to deal with all kinds of environment without loss of finishing interests and their own interests and does not affect the entire supply chain logistics services is particularly important.

### **2.4 Collaborative relationship**

The key research of collaborative LSSC is forward, backward and lateral coordination, the relationship between the three collaborative interface members also include collaborative relationship between the integrated logistics business and customer collaborative relationship, integrated logistics business and function of logistics business cooperative relations, functional logistics business three. Collaborative integrated logistics business and customers, essentially represents a collaborative supply main body with customers on LSSC, there are three kinds of cooperative relation theory: independent type, cooperation type depends on the cooperation and reliance on symbiotic type. Cooperative relation integrated logistics business and function of logistics business may also Verb Confusion independent cooperation type, cooperation type dependent and dependent symbiosis. Functional logistics providers are of independent interest subject, in order to maximize their own interests, mutual between resources, tasks, etc. there are customers must competition, at the same time in order to survive and develop in common, members still exist between the mutual cooperation and dependence, therefore, between functional logistics business performance for the collaborative relationship a separate concurrence type complex relationship.

### **3. Logistics service supply chain coordination problems in technology innovation**

#### **3.1 The lack of trust between the node enterprises**

More and more enterprises have gradually realized that the future supply chain competition is no longer competition between individual enterprises, but between the supply chains of enterprise competition. Therefore in the logistics industry is also in the continuous development of logistics service supply chain, a single enterprise through the chain link all together mutually promote common development through logistics service supply chain, that is, to achieve the overall objective is to achieve individual goals. However, in the logistics service supply chain coordination process, because the logistics service supply chain integration degree is not strong, the lack of long-term cooperation relationship between, integrators and functional service provider customers and integrators, each member chain tend to focus on the maximization of their own interests, collaborative decision making level is low, the local optimization resulting in logistics service supply chain instead of the whole optimization; not the longstanding trust between the integrators and functional service providers, making between enterprises reluctant to share information, asymmetry of information between members of the prominent; for their own interests, there are varying degrees of hidden behavior, in the logistics service process such as: functional service providers transport or storage plan adjustment, different production levels of labor personnel replacement, do not meet customer requirements of equipment replacement, integrators in freight vehicles and personnel season false demand. This behavior is often neglected or later discovered, reducing the overall operation efficiency of logistics service supply chain will cause hidden behavior and the processing of hidden behavior of the.

Conversion of logistics service partner cost is an important factor affecting the trust relationship. Conversion of logistics service partner cost refers to the demand for logistics services providers from a logistics service provider for the total cost spent another logistics service providers, if converted to cost less than the conversion brings profit, logistics service demand of business of logistics service provider's trust level will be relatively low, if the conversion the cost is higher than the conversion of the benefits of logistics services, demand for business logistics service supplier for the trust level will be higher, logistics service switching costs include customer development cost, transaction cost and learning cost, cost of loss of trust, so logistics service providers in order to win the trust of the demand for logistics services should as far as possible to increase the switching costs.

#### **3.2 Supplier selection error**

In logistics service supply chain, general integrated logistics service chamber of commerce occupies the core leading role, but the core resources of logistics services integrator in general do not grasp the logistics operation, or their own resources relative to the use of the whole service resources, smaller proportion, it is to integrate the functional logistics service provider, to provide customers mining the third profit headspring. In addition to the main members of integrators, logistics service

providers is the supply chain, they provide a competitive advantage of logistics services, for customers to provide logistics services, is the actual operation of logistics business. However, some logistics service integrator in the choice of logistics service providers, the choice of logistics service suppliers without the correct analysis, choose the wrong logistics service provider, affect the logistics service supply chain collaboration.

Logistics service supply chain is different from the general and supply chain, in particular operation, integrator is responsible for accepting orders, and then by the logistics service providers in the provision of logistics services, the implementation of logistics solutions, providing logistics service for customers, meet the logistics demand. In logistics service supply chain environment, a lot of integrated logistics service enterprise although has been recognized and logistics service suppliers to establish strategic cooperative partnership, stability is the key to gain sustainable competitive advantage, but in practice, due to various cooperation obstacles and supplier selection and improper management, strategic and cooperative partnership the failure rate has been high, the strategic partner relationship is serious lack of stability and durability. It is precisely because of these strategic partner selection is improper, because the partner relationship is serious lack of stability and durability, affects the process of logistics service supply chain coordination, resulting in a loss to themselves and the whole, reduce income. So choosing a right partner in logistics service supply chain coordination plays an important role in the process of.

### **3.3 The lack of crisis management**

Closely related to collaborative environment and logistics service supply chain, is an important factor to consider in logistics service supply chain enterprises to achieve the overall goal and plan of the. Collaborative environment consists of all the political, economic, legal, social systems, natural and social cultural environment, the level of economic development, science and technology, transportation energy, logistics industry, logistics industry development level structure. The production of environmental uncertainty occurs mainly manufacturing links in the supply chain of production, the main reason is caused by their own production of various during emergencies, emergency refers to internal and external supply chain from accidental factors directly or indirectly caused, formed in a short time, and the outbreak of unexpected events will bring the tremendous influence to break off a supply chain operation it is hard to predict, small probability, high impact. During LSSC operation, will inevitably have some influence the normal operation of emergencies, such as terrorist attacks, earthquakes, tsunamis, storm and so on, but these incidents is sometimes unavoidable, so will cause the staff not in unexpected events occur after timely decision to deal with the crisis, the LSSC plan and goal cannot be scheduled to achieve, failure, cause service delivery system failure, service failure caused by staff on customer needs and requirements of the service behavior of staff service failure and so on logistics service supply chain caused a loss. The main problem to cause this to happen is that many enterprises lack of crisis management ability. In this emergency cases make how to cause the unexpected events of the failure to remedy, normal operation as soon as possible, restore the LSSC to reduce the crisis management decision loss is very urgent. Under emergency rescue service is a collaborative layout and service operation objective of the supply chain is to satisfy their own needs to provide emergency services demand, to produce timely and effective satisfaction.

Although in many enterprises in the formulation of relevant plans and goals, and before implementation will change on these sudden environment is expected to cost calculation and, after the occurrence of possible losses are expected, but sometimes neglected to exit burst after remediation, the important problem which is caused by the loss of logistics service supply chain. The staff in the emergency after the correct implementation of remedial measures can greatly reduce the losses of enterprises.

### **3.4 Task allocation is not reasonable**

In logistics service supply chain in the process of constructing the service integrators, flow in order to play the advantages of integrated logistics service management, to maximize the return on investment, integrated logistics service chamber of Commerce for task allocation of logistics supplier.

The so-called supplier task assignment, refers to the logistics service integrators get customer demand, the integration of logistics tasks and assigned to each functional logistics supplier, by the various functional logistics supplier by providing logistics capacity corresponding to complete logistics tasks. On the one hand, the logistics service integrators can be integrated functional logistics supplier's service ability and service resources, meet the overall demand for services, improve the overall service level; on the other hand, the logistics service integrators can take multiple service provider strategy, introducing competition mechanism, and fully guarantee the quality of logistics services. In actual operation, the logistics service supply chain with random task allocation, task allocation process is a complex dynamic uncertain decision process environment, in the face of many logistics service providers, service cost, each supplier's service quality and ability etc. the differences, logistics service integrators in fully meet the requirements of customers logistics services at the same time, how the various functional logistics supplier reasonable distribution of logistics tasks is important issues to guarantee the sustained and stable operation of the entire logistics service supply chain. Unlike in the face of a single logistics service provider, when there are multiple providers of logistics services, logistics services integrator should not only consider the minimum purchase cost of itself, but also guarantee the quality of service, satisfaction of the maximum optimal supplier. But in the choice of functional logistics supplier after the allocation of tasks to the often occur selected functional logistics supplier not many aspects to meet the needs of customers, service cost, supplier error estimation to choose good service quality and capacity, to ensure sustained and stable operation of the whole logistics service supply chain, lack of task distribution planning reasonable, impact on the entire logistics services supply chain collaboration.

#### **4. Logistics service supply chain cooperative promotion strategy of technology innovation**

##### **4.1 The establishment of trust mechanism**

First, establish a mechanism for sharing information between partners. In the process of logistics service supply chain operation, logistics service demand is decided by the end consumer, but because of the logistics service provider cannot directly contact to final customers, the whole service chain demand will produce amplification phenomenon in the process of information transfer will, in theory called "the bullwhip effect". In logistics service supply chain operation, can make use of the establishment of logistics service supply chain information system platform, to realize the information fast, efficient transmission. Through information sharing, logistics service providers can directly to retailers or consumers of information to arrange production, accurate prediction of supply services, affecting the effective less bullwhip effect, enhance logistics partner trust.

Secondly, establish the credit record of the examination mechanism. The assessment mechanism to build a credit history, evaluation of the partner is strictly abide by the contract, keep the high quality service, whether to have occurred is not conducive to cooperation relations, the bad record whether the transaction, and the supply chain logistics service regularly or irregularly check, the establishment of such a mechanism, every other period of time for an examination, remind all enterprises to abide by the agreement to ensure quality, thus maintain the trust relationship between enterprises, to strengthen to the other partners trust through this mechanism.

Third, establish cooperation mechanisms. Logistics service supply chain partnership enterprise strength range, the weakest service partner has become the bottleneck of the whole supply chain operation, which restrict the development of the whole logistics service supply chain. Through the establishment of the mechanism for mutual assistance, support the development of logistics service partner, in order to help the weaker or the ability to solve problems in certain activities lack cooperative enterprises, through the help of each enterprise to increase mutual trust relationship, to promote the development of logistics service supply chain collaboration.

Finally, the establishment of dynamic contract control system. Dynamic contract namely flexible contract, refers to the change progress and market according to the logistics service partner work in the content of the flexible set of terms, the contract in the form of application form sequence is

completed, by the provisions of existing contract task, to renew a contract, at the same time, the contents of the contract also reflects the different stages of completion the task and the standard, will be given appropriate rewards and incentives, dynamic contract execution process with corresponding dynamic inspection mechanism, incentive and punishment mechanism, benefit allocation and risk sharing mechanism and the clearing mechanism. Finally, the corresponding punishment mechanism can also be set up to prevent the deceive each other, mutual concealment of information and prevent the occurrence of opportunistic behavior in the internal logistics service supply chain, improve partner cheating cost, enhance the mutual benefits of logistics service supply chain of enterprises.

#### **4.2 Optimization of supplier selection process**

Functional logistics service providers as an important member of the logistics service supply chain, its excellent service to ensure the service quality of logistics service supply chain, at the same time, functional logistics service provider service reliability and stability, can reduce the risk of logistics service supply chain, excellent logistics service provider has a positive effect on the integration of enterprise, is considered is the foundation to improve the performance of the whole supply chain logistics services.

In the design and construction of logistics service supply chain, some basic principles should be followed, in order to ensure the efficient and stable supply chain. In actual operation, the optimization selection of logistics service provider is a system process, first carries on the investigation of the suppliers. It is through the proper channels, using appropriate methods, understand the logistics service provider information, and find potential suppliers. Supplier survey content usually includes: basic conditions, enterprises have logistics resources, staffing levels, financial status, and management system and so on, and the qualified suppliers as partners into the supplier system of enterprise. Secondly, perfect the information management of suppliers. The supplier information management is an important content of logistics service supplier management. At this stage, to collect and process the need for supplier information, so as to construct the supplier database, set up supplier file, in order to better manage the supplier. By processing the supplier information, when resource integration by screening conditional on the entire supplier database, plus professional scheduling the deployment of personnel, can achieve reasonably efficient allocation of resources. Based on the extensive collection of potential logistics service provider information, invite suppliers bid and proposal, the establishment of evaluation index system for different types of suppliers, select the appropriate evaluation methods for supplier's primary. The distribution of supplier selection and complete the final task in logistics supplier screening out the first step in. Then we must consider to the supplier, supplier satisfaction in service quality, service cost, service quality, and other aspects of the performance index. Finally, it should supplier evaluation and assessment. After the task allocation, make adjustment timely according to the assessment results, and supplier performance evaluation,.

#### **4.3 To improve the crisis management ability**

In this fast changing and increasingly competitive era, it can reduce the impact can reduce the uncertainty of risk the entire logistics service supply chain and vulnerability, to gain or maintain the competitive advantage, therefore to improve the crisis management ability has become the primary objective. Can first be logistics service supply chain under emergency collaborative development cooperation recovery strategy is divided into the game phase and decision phase.

The establishment of LSSC service quality evaluation system. The main LSSC products are a service, so that the performance of LSSC is mainly reflected in the quality of service. In the premise of the establishment of LSSC service quality evaluation of complete, help to accurately judge the service failure types, service failure, determine the degree of service failure attribution and reduce supply chain members of the cognitive differences of service failures.

The establishment of collecting LSSC emergency event case database To improve the data updating and system in every emergency recovery, which can provide the basis for the next emergency decision.

It should real-time information tracking after the outbreak of unexpected events. LSSC is characterized by high integration of information, reduce information asymmetry is the key factor of

making the rational cooperation recovery strategy. The real-time tracing information in sudden incident broke out, not only conducive to the rapid develop cooperative recovery strategy, but also to provide information and data for the LSSC emergency warning system.

It should strengthen contract management in LSSC. To improve the system on the basis of LSSC cooperation recovery strategy, strengthen the rationality of LSSC contract and close, make emergency procedures and steps can have standard as the basis for decision making.

In coping with emergency LSSC is one of the focus on the problems in the management of the enterprise to strengthen the employee training in this area is very important, the use of correct remedial measures in emergency after can greatly reduce and avoid enterprises don't loss, improve logistics service supply chain collaborative smooth operation.

#### **4.4 The establishment of the task allocation process**

In order to select the function type supplier reasonable, and task allocation is correct, I think should be based on scientific planning process in the selection and given tasks. The first quality of service for all functional suppliers' logistics service in the supply chain, analysis of the service cost and service ability, according to the customer will choose suppliers, reasonable arrangement in accordance with the requirements, formulate the corresponding distribution planning.

In the course of operation of logistics service supply chain, according to the specified planning and allocation of tasks corresponding reasonable procedure. Logistics services integrator from start to undertake the logistics project to final completion task allocation of logistics supplier can be roughly divided into logistics service content definition, feasibility analysis, benefit analysis, logistics task synthesis and decomposition, logistics task allocation and several stages.

## **5. Conclusions**

Logistics service supply chain is to adapt to the development of the logistics industry collaborative requirements, meet the increasing emergence of modern integrated logistics service demand, technological innovation synergy is a hotspot in the field of supply chain management, so the logistics service supply chain technology innovation synergy is the present logistics industry development important direction, is the core problem of logistics service supply chain development, understand and grasp the logistics service supply chain synergy effect factors and existing problems, to promote the logistics service supply chain collaboration has a positive effect.

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