

# Study on Trust and Cooperation of Logistics Service Supply Chain Based on Attributes of Network Relationship

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## ABSTRACT

With the development of the logistics service supply chain, the Chinese Government and logistics industry have put forward the requirement of “increasing efficiency”. From the perspective of trust, this article studies network cooperation capabilities of logistics service supply chain based on the attributes of network relationships in social network theory. We use social questionnaires to measure trust, and then use trust indicators and time indicators to show the strength of logistics service supply chain network and network durability. Finally, the logistics service supply chain relationship attributes will indicate their network cooperation capabilities, and demonstrate their effectiveness through two examples.

**Keywords:** logistics service supply chain, Network strength, Relationship persistence, Trust

## 1. INTRODUCTION

With the continuous development of the Logistics Service Supply Chain (LSSC), the Chinese Government has proposed “cost reduction and efficiency increase” at the macro level and the LSSC member company competition at micro level, to prompt higher efficiency of LSSC.

Michael A *et al.* (2002) believe that trust is valuable, rare, difficult to imitate, and irreplaceable, that is, trust is the core competitiveness. Trust is a kind of resource. It exists in the form of common assets, and if used properly, it can gain a huge competitive advantage. Economists believe that trust can reduce transaction costs. If there is a lack of trust in trading activities, they must spend a lot of resources to measure and monitor to prevent fraud. Xu Ting *et al.* (2017) believe that the trust between enterprises has play a significant role in promoting equity cooperation and contractual cooperation. Some scholars have also studied trust from the perspectives of interpersonal relationships, internal relationships in organizations, and types of trust. However, the scholars pay less attention to the question about what composes the LSSC member company trust and the cooperation behavior, and the relationship between trust and cooperation.

Therefore, it is of great significance to study the relationship between trust and cooperation of LSSC member company.

With regard to social network theory, Bae and Gargiulo (2004) discussed the influence of network properties such as network density and structural holes on the performance of corporate assets in alliance networks. Nooteboom(2004) analyzes the innovation networks’ density and the impact of the intensity of node relationships. Zhao Yan, Wang Bing and Zhou Ruibo (2012) proposed the new thinking of studying strategic alliances from the perspective of social networks, namely network attribute thinking, and they put forward the main problem model of strategic alliance research based on the concepts of structural attributes, resource attributes, and performance. Wang Shanshan, Xu Yanzhen, Li Li *et al.* (2014) described the network properties of standardized emerging industries from the aspects of network nodes, strong and weak relationships, structural holes, and whether they are small-world networks. Scholars have hardly applied social network theory to the study of the relationship between LSSC trust and cooperation.

We study the relationship between LSSC trust and cooperation based on the attributes of social

networks relationship. Then, we make further study according to the thinking of “trust → network relationship attribute → cooperation” and obtain LSSC network cooperation capability formula. The reason why the network cooperation ability is different will be obtained by compare two LCCS examples. From the perspective of trust, it proposes to improve the ability of LSSC network cooperation.

## 2. LITERATURE REVIEW

The study of trust began in sociology and later it gradually expanded into fields such as psychology, management, and economics. The current definition of trust is not uniform. Most scholars agree with the definition given by Mayer (1995): trust is based on the expectation that the other party will take beneficial actions on the side of the party, and the willingness of one side to expose vulnerability points to the other side will replace the management and control of the other side's actions.

Sako (1992) divides trust into contractual trust, competency trust, and goodwill trust. Contractual trust is a kind of trust that depends on contracts. The more detailed the contract, the more it can form the trust of the parties to the transaction. In fact, the trust of both parties to the transaction is the trust of both parties in the contract. Competency-based trust refers to the ability of a party to complete a certain behavior according to the requirements and expectations of the other party, such as the ability of a supplier, not only refers to quality requirements, but also includes quality assurance, supply time, and reliability of supply, etc.. It forms an important content of value evaluation of an enterprise. Good faith refers to the trust that one party to a transaction gives to others out of kindness. Good here means common faith, friendship, sympathy, etc..

Ganesan (1994) believes that the ability trust and goodwill trust of manufacturers and suppliers in the supply chain increase the manufacturer's transaction-specific asset investment of suppliers, make suppliers feel respect, ability trust and their own important position in the cooperative relationship, and reduce the imbalance between the two parties. Dependence, Maintain and develop a long-term cooperative relationship with each other. A good partnership is an agreement that spans a certain period of time. It

promises the continuation of the relationship between partner members and the calculation of trust and goodwill trust between them. It shares and communicates information held by partners, and shares risks and benefits.

Benner *et al.* (2001) believes that trust is related to the other party's trustworthy value. Eckel *et al.* (2004) demonstrated that trust and risk choices have nothing to do with risk appetite through experiments. Bohnet *et al.* (2004) believes that trust is related to the psychological cost of being betrayed because of believing someone else. Ho *et al.* believe that trust is affected by expected interests. Rousseau *et al.* (2005) pointed out that different environments play a key role in understanding the meaning of trust. Moorman *et al.* (1992) believe that trust is willing to trust trading partners, and trading partners are considered reliable. Dyer *et al.* (2000) believes that trust is to believe that partners are willing and able to fulfill their obligations and commitments. At the same time, partners have good intentions for the behavior of the entire alliance. The two parties will not do anything to harm the other side. Currall *et al.* (2002) believe that trust is that both parties are willing to comply with the agreement and assume responsibility. For any party will not use the other's weaknesses. Johnson *et al.* (1996) believes that trust between supply chain companies refers to the trust between suppliers, manufacturers, and customers in the supply chain. It is one of the partners that believes that other partners are willing and able to their commitment to corresponding obligations. Ye Fei *et al.* (2009) believe that supply chain trust refers to the confidence of manufacturers, suppliers, customers, and distributors in the supply chain that they believe each other's willingness to take responsibility, and that all partners believe that no one will use the other partner weaknesses. Zhang Xumei *et al.* (2011) proposed a structural equation model to empirically study the relationship between trust, relationship commitment, knowledge transfer, and cooperative performance among supply chain companies. Zhang Yuhua *et al.* (2017) proposed the role of trust in information sharing. By synthesizing the above definition of trust according to different scholars, we can find that the beliefs of the partners reflected in the trust or beliefs of the promises are reliable, and

that each partner will fulfill its obligations in this kind of cooperative relationship, and at the same time, it is also a belief that both parties will cooperate and be voluntary to take responsibility and no party will use the other party's weakness to do other thing. This article focuses on the trust of LSSC. It refers to the trust between integrators, subcontractors, integrators and demanders, that is, they consider each other to be reliable and perform obligations. Chen Yezhen *et al.* (2010) illustrated two measures of trust level. There are two methods for measuring the level of trust. The first is the social survey questionnaire method. Before the rise of experimental economics, the measure of trust level generally used social survey questionnaires sent out by GSS (General Social Survey) and WVS (World Values Survey). The questionnaire survey mainly includes three aspects of individual trust, fairness, and attitude toward helping others. The second is the experimental method of trust game. This paper mainly uses social questionnaires to study the measure of trust. In the supply chain (sc), the meaning of trust includes competence, reliability, and friendliness. His paper gives detailed indicators for the LSSC's trust implications. Capabilities include the capital strength of member companies, their ability to maintain normal operations, their ability to provide various functional services, their ability to obtain revenue, and their ability to assume social responsibility. Reliability includes the degree of the completion of commitments or contract and corporate culture. Among them, the degree of fulfillment of commitments or contracts includes the consistency of the contract, the punctuality of payment, the timeliness of services, etc. Corporate culture includes legal compliance, corporate ethics, and industry reputation. Friendship includes attention, information disclosure, and price fairness.

In the social network theory, the network relationship attributes are mainly used, namely the strength of the relationship and the durability of the relationship. Relationship strength is an important dimension of innovation network characteristics. Referring to related theories of inter-organizational networks, network strength generally refers to the frequency of communication between organizations. Granovetter (1973) defined the characteristics of

network strength by using "the maintenance of emotional intimacy, interaction length, mutual trust, and reciprocity." Strong relationships include close feelings, long-lasting friendships, and constant interaction. In a strong relationship, it can effectively promote mutual trust and deepen cooperation to obtain high-quality information and tacit knowledge. Through strong relationships, network members are often more willing to help each other and resources between networks are easier to share effectively. In addition, according to the theory of weak relationships, weaker relationships between firms can help convey fresh information and knowledge to each other and avoid the redundancy of information and knowledge. Kraatz (1998) has proposed that weak links between organizations can improve the breadth of content exchanged between them, maintain flexibility in the dynamic evolution of network relationships, and increase organizational flexibility; and strong relationships between organizations are more likely to focus on communicating content with one another. The depth can enhance the operational efficiency of the organization, but it is easy for the member companies of the network to create inertia and constraints, which limits the development of the network. Jiang Lan (2016) believes that both ability trust and benevolence based trust between the supply chain companies can promote the cooperation stability of supply chain. And the supply chain internal and external integration, supply chain knowledge sharing, supply chain resource dependence are the mediator variable of them. Li Dan *et al.* (2018) proposed a theoretical framework for the strength of network connectivity and technology innovation with trust, and pointed out the relationship between trust and strength of network connectivity. Persistence refers to the persistence of the relationship between technology, knowledge, and experience exchanged among network member companies. The longer the duration of communication between them, the higher the durability of the network connection, and the more stable the mutual connection relationship becomes. Therefore, the durability of the relationship is an important indicator of the degree of stability of the network relationship, that is, the length of time that the core enterprise cooperates with other network member companies. In general, long-

lasting relationships will deepen mutual trust, thereby reducing the cost of mutual supervision, and at the same time improve the consistency of actions, which helps exchange and share some more important information and knowledge, and have a positive effect on the performance of both companies. This article is based on the above indicators based on research, combined with the characteristics of the development of LSSC, to analyze the relationship between trust and network relationship attributes.

This article will study how trust connotation affects the attributes of LSSC network and how the attributes of network relations affects the ability of network cooperation.

### 3. PROBLEM DESCRIPTION AND QUANTITATIVE EXPRESSION

#### 3.1. Problem Description

In a logistics industry park, there are subcontractors  $N_1, N_2, N_3, \dots, N_n$ ; integrators  $M_1, M_2, M_3, M_m$ , and demanders  $T_1, T_2, T_3, T_r$ . In this paper, we use the three indicators of capability  $A$ , reliability  $K$ , and

friendliness  $Y$  to measure trust. Giving a certain weight to the ability, reliability, and friendliness, indicating the impact on the strength of the network  $F$ . The relationship persistence  $S$  is represented by the length of the integrator's cooperation period. The goal is to make the greatest capacity for network cooperation in the entire logistics service supply chain, that is, network strength and relational durability.

In this paper, the scores of the questionnaires for the trust measurer  $A$ , reliability  $K$ , and friendliness  $Y$  between the integrator and the customer and between the integrator and the subcontractor are presented, as is shown in Table 1.

#### 3.2. Assumptions

Taking into account the gap between expression and actuality, this paper proposes the following assumptions:

1. The integrator is a structural hole. There is no direct contact between the demand side and the subcontractor. There is no transfer of trust here. Therefore, the trust exists only

Table 1: Trust measure item details

Item details	Integrators $\rightarrow$ Subcontractor $M_j \rightarrow N_i$	Subcontractor $\rightarrow$ Integrators $N_i \rightarrow M_j$	Integrators $\rightarrow$ Demand side $M_j \rightarrow T_k$	Demand side $\rightarrow$ Integrators $T_k \rightarrow M_j$
capability	Capital capability	Scale: Number of subcontractors and demanders; Registered capital of integrators; Total volume of subcontractors and demanders	Capital capability	Scale: Number of subcontractors and demanders; Registered capital of integrators; Total volume of subcontractors and demanders
	Operational capacity	Coverage: Regional service scope (citywide, national, global); business function scope	Paying power	Coverage: Regional service (citywide, national, global); scope business function scope
	Profitability	Reputation		Word of mouth
Reliability	Social responsibility			
	Fulfil the validity of the contract	Fulfil the validity of the contract	Legal compliance	Subcontractor screening power
	Conformance of the quality of the industry	Customer screening power	Legal compliance	
Friendliness	Legal compliance	Legal compliance		Supervise the ability of subcontractors
		Supervise customer capabilities		
	Responsiveness: recovery rate, recovery quality / specialization, recovery speed, response level.	Responsiveness: recovery rate, recovery quality / specialization, recovery speed, response level.	Corporate culture favorability	Responsiveness: recovery rate, recovery quality / specialization, recovery speed, response level.
	Fairness and fairness: prices, materials	Fairness and fairness: Admission fees, time limits		Offer

between the subcontractor and the integrator and between the integrator and the demand side.

2. The trust relationship is two-way. There are integrators to subcontractors, subcontractors to integrators, integrators to demanders, and demanders to integrators. In order to simplify the calculation, the two-way trust relationship is described by the mean. Because trust is bi-directional, the trust measure in this paper selects a value with less trust between two parties, that is, a weaker one in the reverse or positive direction.
3. The degree of trust includes only three factors: ability, reliability, and friendship. No other factors are considered.
4. Consider the strength of the network and the durability of the relationship only from the perspective of trust. Therefore, the network strength and the durability of the relationship only consider the influence of trust.

### 3.3. Symbol Description

**Table 2: Network cooperative computation model symbol description**

Symbol	Instructions	Symbol	Instructions
N	Subcontractor	M	Integrators
T	Demand side	C	Network cooperation capabilities
F	Network strength	S	Persistence
$\alpha_1$	weight of Network strength	$\alpha_2$	The weight of relationship persistence

### 3.4. Equation establishment

In an LSSC system, the logistics service supply chain network cooperation capability is derived from the weighted sum of the network strength of the logistics service supply chain and the relationship persistence. It is shown in equation 1:

$$C(N, M, T) = \alpha_1 * F(N, M, T) + \alpha_2 * S(N, M, T) \quad (1)$$

$$\alpha_1 + \alpha_2 = 1$$

The network strength measurement of a logistics service supply chain network should consider the directionality of the network, so equation 2 define the network strength of the network as the minimum of the forward network strength and the reverse network strength.

$$F(N, M, T) = \min (F(NM, MT), F(TM, MN)) \quad (2)$$

The strength of the forward network in the logistics service supply chain network is weighted by the network strength of all the subnetworks included in the network. Its weight is the proportion of the network strength of the sub-network in the forward network. It is shown in equation 3:

$$F(NM, MT) = \frac{F(N_1, M_1, T_1)}{\sum F(N_i, M_j, T_k)} * F(N_1, M_1, T_1) + \dots + \frac{F(N_n, M_m, T_t)}{\sum F(N_i, M_j, T_k)} * F(N_n, M_m, T_t) = \frac{\sum (F(N_i, M_j, T_k))^2}{\sum F(N_i, M_j, T_k)} \quad (3)$$

Similarly, the strength of the reverse network in the logistics service supply chain network is shown in equation 4:

$$F(TM, MN) = \frac{F(T_1, M_1, N_1)}{\sum F(T_k, M_j, N_i)} * F(T_1, M_1, N_1) + \dots + \frac{F(T_t, M_m, N_n)}{\sum F(T_k, M_j, N_i)} * F(T_t, M_m, N_n) = \frac{\sum (F(T_k, M_j, N_i))^2}{\sum F(T_k, M_j, N_i)} \quad (4)$$

In a logistics service supply chain network, we define the relationship persistence of the system as the product of the persistence of the relationship between the subcontractor and the integrator, and the product of the integrator's and the demander's relationship. It is shown in equation 5:

$$F(N_i, M_j, T_k) = F(N_i, M_j) * F(M_j, T_k) \quad (5)$$

The durability of the relationship of the network in the logistics service supply chain network is composed of the weighted relationship durability of all the sub-networks included in the network. Its weight is the proportion of the persistence of the sub-network in the network. The expression is as shown in equation (6):

$$S(NM, MT) = \frac{S(N_1, M_1, T_1)}{\sum S(N_i, M_j, T_k)} * S(N_1, M_1, T_1) + \dots + \frac{S(N_n, M_m, T_t)}{\sum S(N_i, M_j, T_k)} * S(N_n, M_m, T_t) = \frac{\sum (S(N_i, M_j, T_k))^2}{\sum S(N_i, M_j, T_k)} \quad (6)$$

The relationship persistence of the logistics service supply chain network itself is the time measurement of the cooperation between the two parties. Therefore, the durability of the relationship between the positive network and the reverse network in the network is the same:

$$S(NM, MT) = S(TM, MN) \quad (7)$$

$$i = (1, 2, \dots, n), j = (1, 2, \dots, m), k = (1, 2, \dots, t)$$

#### 4. EXAMPLE

There are two logistics parks A and B in one place. There are three subcontractors, two integrators, and three demanders in the park. The survey obtained ISSC's mutual cooperation time in the two logistics parks and the trust measure between integrators and customers as well as integrators and subcontractors. According to the above model, EXCEL is used to calculate the ISSC network cooperation capabilities of the two logistics parks. According to the research, the weight of the capability, reliability, and friendliness are 4:4:2. According to the trust scores of ISSC in the logistics park, the strength of the logistics park A sub-network is shown in Table 3:

**Table 3: Sub-network strength table of logistics park A**

N1-M1	7.2	M1-T1	8.8
N1-M2	8	M1-T2	7.6
N2-M1	6.8	M1-T3	7.6
N2-M2	7.4	M2-T1	9.2
N3-M1	8.2	M2-T2	7
N3-M2	6.8	M2-T3	7.4
M1-N1	7.6	T1-M1	8.6
M1-N2	6.8	T1-M2	8.2
M1-N3	7.4	T2-M1	8.2
M2-N1	7.8	T2-M2	8
M2-N2	8	T3-M1	6.4
M2-N3	6.8	T3-M2	8

$$\begin{aligned} F_A(NM, MT) &= \frac{\sum(F_A(N_i, M_j, T_k))^2}{\sum F_A(N_i, M_j, T_k)} \\ &= 0.596 \quad (i = 1,2,3; j \\ &= 1,2; k = 1,2,3) \end{aligned}$$

$$\begin{aligned} F_A(TM, MN) &= \frac{\sum(F_A(T_k, M_j, N_i))^2}{\sum F_A(T_k, M_j, N_i)} = 0.592 \quad (i = \\ &1,2,3; j = 1,2; k = 1,2,3) \quad F_A(N, M, T) = \\ &\min(F_A(NM, MT), F_A(TM, MN)) = 0.592 \end{aligned}$$

Logistics Park A has a positive network strength (N-M-T) of 0.596 and a reversed network strength (T-M-N) of 0.592. Therefore, the network strength of Logistics Park A is 0.592 based on the assumption.

According to the survey, the length of the ISSC cooperating time in logistics park A is shown in Table 4 (unit: year/10 years):

**Table 4: Issc cooperating time of logistics park A**

N1-M1	8	M1-T1	6
N1-M2	9	M1-T2	9
N2-M1	10	M1-T3	8
N2-M2	8	M2-T1	7
N3-M1	9	M2-T2	9
N3-M2	9	M2-T3	8

$$\begin{aligned} S_A(NM, MT) &= \frac{\sum(S_A(N_i, M_j, T_k))^2}{\sum S_A(N_i, M_j, T_k)} = 0.683 \\ &(i = 1,2,3; j = 1,2; k = 1,2,3) \end{aligned}$$

Since ISSC's subcontractors and integrators, integrators and demanders have the same forward and reverse cooperation time, the durability of Logistics Park A is 0.683.

The network cooperation ability of Logistics Park A is:

$$\begin{aligned} C_A(N, M, T) &= \alpha_1 * F_A(N, M, T) + \alpha_2 * \\ S_A(N, M, T) &= 0.592\alpha_1 + 0.683\alpha_2 \end{aligned}$$

The logistics park B is calculated by the same method. The sub-network strength table of logistics park B is shown in Table 5:

**Table 5: Sub-network strength table of logistics park B**

N1-M1	4.2	M1-T1	6.4
N1-M2	4.2	M1-T2	4.2
N2-M1	4.8	M1-T3	6.2
N2-M2	6.8	M2-T1	7
N3-M1	5.6	M2-T2	5.8
N3-M2	5	M2-T3	6
M1-N1	4.8	T1-M1	6.6
M1-N2	5.8	T1-M2	5.2
M1-N3	6.2	T2-M1	5.6
M2-N1	6.8	T2-M2	4.8
M2-N2	5.4	T3-M1	5.2
M2-N3	5	T3-M2	5.2

$$\begin{aligned} F_B(NM, MT) &= \frac{\sum(F_B(N_i, M_j, T_k))^2}{\sum F_B(N_i, M_j, T_k)} = 0.321 \\ &(i = 1,2,3; j = 1,2; k = 1,2,3) \end{aligned}$$

$$\begin{aligned} F_B(TM, MN) &= \frac{\sum(F_B(T_k, M_j, N_i))^2}{\sum F_B(T_k, M_j, N_i)} = 0.315 \\ &(i = 1,2,3; j = 1,2; k = 1,2,3) \end{aligned}$$

$$\begin{aligned} F_B(N, M, T) &= \min(F_B(NM, MT), F_B(TM, MN)) \\ &= 0.315 \end{aligned}$$

According to the survey, the length of the ISSC cooperating time in Logistics Park B is shown in Table 6 (unit: year/10 years):

**Table 6: Issc cooperating time of logistics park B**

N1-M1	6	M1-T1	8
N1-M2	8	M1-T2	7
N2-M1	7	M1-T3	9
N2-M2	8	M2-T1	6
N3-M1	9	M2-T2	8
N3-M2	8	M2-T3	6

$$S_B(NM, MT) = \frac{\sum (S_B(N_i, M_j, T_k))^2}{\sum S_B(N_i, M_j, T_k)} = 0.579$$

$(i = 1,2,3; j = 1,2; k = 1,2,3)$

The network cooperation capability of Logistics Park B is:

$$C_B(N, M, T) = \alpha_1 * F_B(N, M, T) + \alpha_2 * S_B(N, M, T) = 0.315\alpha_1 + 0.579\alpha_2$$

This chapter applies the EXCEL software to calculate the network cooperation capabilities of the two logistics parks A and B in a certain place using the model described in the previous section. The results show that the network cooperation capacity of logistics park A is 0.592, and the network cooperation capacity of logistics park B is 0.315. The network cooperation capabilities of the two logistics parks are different, which also proves that the model is suitable for measuring LSSC network cooperation capabilities.

## 5. CONCLUSION AND SUGGESTION

### 5.1. Conclusion

This article uses the attributes of network relations in social network theory, starts from the trust measure, and quantifies the LSSC network cooperation capabilities. Trust is the key factor in promoting cooperation, trust is the basis of cooperation, and trust is the guarantee of cooperation. Therefore, the supply chain partners trust each other can cooperate efficiently, and the efficient cooperation must show through the various aspects of cooperation, can produce the good cooperation effect. Different levels of trust in the supply chain lead to different levels of cooperation. The more trust the supply chain partners have, the better the integration of all aspects of cooperation, and the greater the degree of cooperation. Trust-based cooperation will reduce many unnecessary economic costs and time costs. The greater the value of the

trust measure index is, the longer the cooperation time and the higher the network cooperation capability are. In this paper, we use the network strength and the relationship persistence to indicate the network cooperation ability, use the degree of trust to express the strength of the network, and use the cooperation time to show the durability of the relationship. Among them, the degree of trust has three measures of the degree of trustworthiness, reliability, and durability. The measure of cooperation time is the duration of cooperation, and there are specific details on the three measures of trust. Based on the above measures, integrators gave the score to the sub-contractors, sub-contractors to the integrators, integrators to the demanders, and demand-side to the integrators on social questionnaires to obtain the final LSSC network cooperation capabilities. This paper has the following conclusions: First, LSSC trust degree is positively correlated with network strength. The higher the trust measure value is, the more frequent the cooperation between member companies is. Second, the LSSC network cooperation ability is positively related to its network strength and relationship persistence. The more frequent the cooperation between member companies is and the longer the time of maintaining the cooperative relationship is, the stronger the network cooperation ability of the LSSC is.

### 5.2. Suggestion

Capacity trust, goodwill trust, and higher computational trust among supply chain enterprises lead to the full recognition of each other's ability to perform tasks, resulting in loyalty, goodwill, integrity, and reliable attitudes and motives among each other. When the other party is in a difficult situation, it sincerely provides help at the expense of its own cost, realizes that the benefits derived from maintaining the relationship of trust between the two parties are higher than the costs and losses of suspending and destroying the relationship of trust, actively renewing and fulfilling the contract, and opportunism. Trust each other to communicate and share information, acting on supply chain cooperation stability through the following paths: First, promote supply chain

Exchange and complement scarce resources among enterprises, form resource bundling effect,

optimize resource allocation and increase resource dependence. Second, on the one hand, trust provides external pressure, external pressure is converted into internal motivation, and cooperation between enterprises and suppliers and customers reduces external integration costs, strengthens operational coordination and relationship intimacy, and improves the stability of supply chain cooperation; On the other hand, trust enables enterprises in supply chains to learn and collaborate, absorb and digest knowledge, share customer demand information, improve product design and production processes, optimize and allocate resources, and improve production processes and organizational operating patterns. Promote product and technology consistency and standardization, and integrate within the supply chain. Third, increase the frequency of communication and communication between enterprises in supply chains, increase the willingness of enterprises to share knowledge, share knowledge and customer information, supply information, etc., reduce the bullwhip effect, and cooperate to respond to uncertain customer needs and changing external environment. Therefore, supply chain enterprises should strengthen the ability trust, goodwill trust and higher computing trust through communication and exchange, perfect the incentive mechanism, establish and consolidate the attitude commitment, strengthen the supply chain resource dependence, actively carry out the internal and external integration of the supply chain, and guide the knowledge sharing behavior of the supply chain.

The examples fully demonstrate that there is a certain gap between the two LSSC network cooperation capabilities, and also indicate that there is a gap between the strength of the two LSSC networks and the durability of the relationship. Therefore, the following suggestions are proposed to improve the LSSC's network cooperation capabilities: First, improve the capabilities of member companies, and improve substantively in terms of capital capabilities, business capabilities, and profitability. In addition, taking use of advertising, public welfare and other forms to expand the visibility and improve the industry reputation; Second, Strictly fulfil the contract and the integrator on the chain shoulders the task of supervising and

executing subcontractors and demanders. Each member company fulfills its obligations on time according to its quality. Clear responsibility, not mutually making excuses. Third, establish a LSSC system culture, achieve friendly cooperation, fairness and fairness, and create a good atmosphere on the chain.

### **5.3. Prospects**

First of all, in this paper, there are some limitations in the setting of the weight of the network strength, relationship persistence and the weight setting of the three measures of trust. In the future, we can seek a better method to set. Second, this paper considers the positive and negative correlations, and does not distinguish which direction is more important for the cooperation that facilitates LSSC. Furthermore, Relational persistence expressed with cooperative length of time, one of the motivations behind this is trust. For the sake of simplification, the duration of cooperation is directly expressed in this article. Finally, there is a certain degree of subjectivity in the methods used by the company for scoring. The above questionis also worth studying in the future.

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