The Relationship Model Between Suppliers and Retailers Based on System-collaboration

WU Jun, ZHANG Lei, WANG Mengya
Harbin Institute of Technology, School of management, XiDaZhi street number 92, Harbin, Heilongjiang Province, China
zhangleileaf@126.com

Abstract: In recent years, China’s distribution channel has developed considerably. Retailers are carrying out in scale and organization day by day, followed by the relational crisis between suppliers and retailers, even with increasing confrontation. This research devotes to solve this question effectively, realize the effective cooperation between retailers and suppliers and it hopes to bring benefits to the related enterprise's actual operation. On the basis of reading a large number of related literatures, this article mainly adopted literature research methodology to propose its own system frame, which means by deeply analyzing the relational crisis between suppliers and retailers, it proposes a feasible solution of this issue, that is to take the system coordination's thought as the strategic instruction and establish their relational model. This model divides the bilateral union cooperation into three levels, namely, the strategic level, the motivational level and the business level. It hopes to form a joint decision-making system on the basis of incentive mechanism and on the premise of bilateral information-sharing and knowledge-sharing, therefore it can optimize the overall interests, provide a new thought to the further exploration of the relationship between suppliers and retailers, realize the fundamental shift in relations between the two parties and achieve a win-win result.

Keywords: system-collaboration, suppliers and retailers, the relationship model

1 Introduction

1.1 The background of the research
In recent years, with the development of the distribution channels, represent by Wal-Mart, Carrefour and Guomei, the confrontation between suppliers and retailers which located upstream and downstream of the supply chain are growing continuously. On one hand, retailers have more bargaining power and negotiating capacity. In order to reduce inventory, tie up funds and maximize their own interests, they tend to reduce the purchase price and ordering time, so that suppliers face enormous production risks and inventory risks. On the other hand, in order to control the expansion of strong retailers, suppliers have begun to reduce operation costs, improve logistics speed and speed up the recovery of funds to enhance their own dominance. Thus, their relational crisis is escalating. The official language of the Proceedings is English.

1.2 Literature review
To solve this problem, the foreign scholars’ research started early. The results in recent years as follows. Marsha A. Dickson, Li Zhang(2004) investigated how Chinese retailers perceive their foreign brand apparel suppliers and explored the use of power theory for explaining these relationships by surveying of 150 apparel retailers operating in Beijing. Chwen Sheu, HsiuJu Rebecca Yen, Bongsug Chae(2006)proposed a model which demonstrates how eight critical social and technical variables are directly and/or indirectly related. This knowledge will enable the management of supplier-retailer networks to produce better supply chain collaboration and performance. Jae-Eun Chung, Brenda Sternquist, Zhengyi Chen(2008) provides insight into how cultural influences are embedded in distribution channel relationships. Although scholars in China started late, but the results were as good as foreign scholars, not only in-depth analysis of reasons for the formation of conflict, but also to form
the relationship improved framework. For instance, Ma Jinjun(2009) pointed out that the direct cause of the conflict is the profit, which can been see mainly in goal conflict, cost conflict, and physical process conflict. Wang Xuhui(2009) established a perfect relationship framework between suppliers and retailers, which consists of five core dimensions: evaluation system of collaborative performance, the information sharing, the incentive mechanism of members, the collaborative decision-making, the supply chain integration, and each of the dimensions related to others.

1.3 The study route and characteristics
On the basis of a lot of relevant literature, this article form the own research ideas. Part I, the description of the main conflict between suppliers and retailers, which means competition-oriented error, goal conflict, process conflict, asymmetric information. The second part, an effective solution to this problem, namely, in the instruction of system coordination’s thought, establishing the bilateral partner relations, distributing profit rational, sharing the risk, enhancing the sharing of information and knowledge, making decision together, then optimizing the overall benefit. The third part, constructing the suppliers and retailers’ relational model, which divides the bilateral union cooperation into three levels, the strategic level, the motivational level, and the business level. Under the instruction of system coordination’s thought, it hopes to form a joint decision-making system on the basis of incentive mechanism, and on the premise of both information-sharing and knowledge-sharing to achieve a win-win result. The forth part, Using a simple mathematical formula to calculate the coordination degree of the new system which composed by suppliers and retailers, to be the evaluation of this collaboration and the basis for the continued collaboration.

This article’s characteristics lie in, the firstly, former research, although proposed the model, the arrangement is not very clear. This article will divide the relational model into three levels to elaborate, namely, the strategic level, the motivational level, and the business level, which are easy to understand. Secondly, join knowledge sharing into information sharing, which has made up some deficiencies of just information sharing, moreover it conforms to the supply chain's new request in the knowledge economy times. Finally it has joined some mathematical computation in the article, although it is simple, it meet the transformation of qualitative to quantitative.

2 The Main Manifestations of Relationship Conflict Between Suppliers and Retailers

2.1 Competition-oriented error and the goals conflict
Suppliers and retailers both are independent economic entities and they want maximize interests. Their competition-oriented at this stage is to get their own interests through squeeze other's profit. The error of competition-oriented also leads to the objective conflict between suppliers and retailers. Take delivery or example, the retailer expects as little inventory as possible on the premise of not affect their daily occupation, but suppliers think it can reduce costs if productions reach a certain amount for distribution, so the two sides have conflict. But in fact, if suppliers and retailers can develop a common understanding of cooperation and adopt joint behavior, then the both sides can expanded the overall interests.

2.2 The information is asymmetrical
The retailers stand closest to consumers, they may gain information directly and accurately, many retailers will take the information superiority as a bargaining chip to suppliers, in this situation, the suppliers are unable to obtain the retailers’ stock informations and the sales message. Similarly, the suppliers will also not publicize their own information to the retailers. Thus, both sides keep secret, which causes the two sides’ benefit unbalanced in market transaction, which will affect the social fair, the fair principle and the efficiency of market allocation. Finally it increases the cost to gain
informations, enhances the product cost, drop the products’ competition power, and it’s easy to lead to the bilateral conflict.

2.3 Conflict in process
In the physicist distribution system, the nerve business relationship and the low level's system support causes the cooperation between suppliers and retailers not close, the process conflict is very serious. For instance, in the allocation process, the suppliers deliver the wrong goods frequently, not on time, the goods damage, and so on. Also the retailers take the goods inefficiency, take wrong goods, and so on. In the aspect of funds, the retailers often takes the suppliers’ funds excessively in the channel dominant by retailers, such as extending the account time, getting slotting allowance with no reasons, squeezing the suppliers’ profit, which cause the suppliers unable to undergo this situation, so the conflict occurs inevitably.

3 The Option to Improve the Relationship Between Suppliers and Retailers
Suppliers and retailers are two parters on the supply chain, they play the indispensable roles in value creation, but as a single body of supply chain, they always consider their own interests and needs habitually, apart themself from the whole chain and make plans and designs alone. So the strategy is always not appropriately and the conflict is unavoidable. The feasible scheme to solve the conflict is maximize the profit based on system coordination's thought. System is an organic which has specific functions and consists of many interrelated and interacted elements. The purpose of adopting the system collaboration’s thought is to organize or control the system in some way, so that the system can be in order, achieve a coordinated state, and make the system's overall function larger than the sum of the every part of sub-system. For the issue of relationship conflict between suppliers and retailers, under this idea is to coordinate their logistics, funds, informations, and knowledge, redesign them appropriate in a technical perspective, and build a mutual partnership, to distribute profits reasonably, share the risks, improve the degree of information sharing, and reduce the inventory. Thus it can reduce the total cost, and optimize the overall interests.

4 The Model Establishment of Relationship Between Suppliers and Retailers
The above analysis shows that at this stage, there is a relational crisis between suppliers and retailers. Under the thought of collaboration, suppliers and retailers can from conflict to collaboration, then achieve a win-win result. This collaboration is divided into three levels, the strategic level, the motivational level, and the business level. That is under the guidance of the strategic thought, it can form the common aspiration of both sides, then based on incentive compatibility mechanism in motivation level, which provide a motive for cooperation, finally complete the joint decision-making under the premise of information sharing and knowledge sharing and optimize the overall interests.

4.1 Strategic coordination: system collaborative thought
The method of system collaborative is a scientific method which is used for planning, researching or design the organization and management. It includes the overall concept, integrated concept, scientific attitudes and so on.
Strategic coordination,

the coordination in motivation level:

coordination in the business level,

Figure 1: The new model of relationship between suppliers and retailers.

**Overall Concept**
The overall concept requires a systematic method to do the research on a basis of planning comprehensively, and handle the problems coordinately. So that systems between general and partial, between the parts, and between systems and environment can achieve the dialectical unity. For the model, which require the functions of the system which compose by suppliers and retailers greater than the sum of their respective function, and the function will lead to a qualitative change.

**Integrated Concept**
The requirements of integrated concept is from the system’s overall objective, the various relevant experience and knowledge will be combined and used coordinately, so that it can develop a new system concept. For the model, which called for collaboration between suppliers and retailers to create a new system to low the costs, increase profits and access to comprehensive benefits.

**Scientific Concept**
The requirements of scientific concept are setting up the science attitude when analyzing questions, doing things according to scientific rules, and trying our best to develop the potential value of the system. For the model, the requirements are when handling the problem, on one hand, there must be a strict sequence of work, and combine the qualitative with quantitative. On the other hand, we should recognize that the new system formed by suppliers and retailers has a certain structure, levels and specific features, the components of the whole system interrelated and interactive, and we must pay attention to both the state and the change.

4.2 The coordination in motivation level: incentive compatibility mechanism

In the marketing economics, every rational people have a self-interest inside, the individual behavior follows the rules of self-serving. The institutional arrangements, which enable people to pursue individual interests, and just consistent with enterprises’ objectives to maximize the collective value, is incentive compatible mechanism. The establishment of mechanisms ensure that suppliers and retailers enhance their profitability through increasing the optimal overall performance. Also incentive compatible mechanism is often an afterthought compensation mechanism to solve the problem, such as
earnings are not synchronized, the commitment of risk, and so on, which means that this mechanism guarantees the risks and benefits of the rational distribution between suppliers and retailers.

**Income**

The foundation of forming the union is the competitive pressure, but which maintains their relations and enhance their cohesive force must be superior earnings sharing. We must observe the following principle when distribute the income: (1) the mutually beneficial principle, namely, the allocation scheme may give the full guarantee to suppliers and retailers' basic income and will not influence the bilateral enthusiasm. (2) the structure income optimization principle, namely, according to the actual situation, we should consider each kind of influencing factor fully, determine the most superior structure of the income distribution reasonably, urge the best cooperation between suppliers and retailers and realize the coordination development. (3) corresponding principles of risk and return. When we formulate the distribution programs, we should give full consideration to the level of risk which suppliers and retailers bear and to compensate the partner who has much risk, so that it can enhance co-operation initiatives. (4) the principle of individual rationality, suppliers and retailers who participate in the synergies will gain a return greater than the individual actions, or there would be betrayal phenomenon.

**Risk sharing**

The risk of suppliers and retailers in collaborative activities means the possibility of loss in coordination, and it is related to the expect benefits, it shows that the rising cost, the decline of actual income, or benefit-cost ratio drops. In risk sharing, the risk distribution can be reflected by combining the whole income distribution with the cost allocation, after comparing and contrasting, we can find the differences between their actual income and expected income, namely the risk loss.

### 4.3 Coordination in the business level

**Information Sharing**

The information sharing refers that suppliers and retailers may gain the private information mutually to monitor the products’ mobile condition in the various links, thus we can have the clearly understanding of the products’ supply and demand, not the order information from upstream and downstream, which means that suppliers will make the prompt response to the customer demand change, and retailers also does not need to worry about the suppliers’ supply capacity, that may cause their large inventory. Therefore, the information sharing has met the visualization between suppliers and retailers and has provided a basis for the union decision-making.

**Knowledge sharing**

The development of modern economics brings a new requirement for supply chain. Knowledge becomes the key to rise the efficiency of operation day by day. The existence and development of the supply chain is not only to increase the value, but also to create new value, and knowledge is the most basic way of creating new value and the most feasible way of maintaining competitive advantage of supply chain. So the improvement of the relationship between suppliers and retailers must realize knowledge sharing on the basis of information sharing.

The chart describes the whole process of knowledge sharing clearly. On the basis of information sharing and information systems, suppliers and retailers can realize the exchange between different databases, complete automatic exchange of information, and provide premises for knowledge exchange and sharing. Then it must carry on the processing and discovery of knowledge, which is the process that reorganizing chaotic knowledge between suppliers and retailers. Knowledge processed, mainly includes making the knowledge coherent, standard, classified, and so on. The knowledge discovery is to excavate the information reasonably, extract useful information, and produce the new knowledge, the technology are the data mining, the method of decision tree, the neural network, and so on. After tidy the knowledge, it must be screened before enter the knowledge base. But if it is part of the unique knowledge and core knowledge in a company, the knowledge need not to share and should remain in the company's Knowledge Base, or access to knowledge sharing base, which is the protection of
intellectual property and the maintenance of competitive advantage. At the same time, knowledge sharing base should also include public knowledge and marketing knowledge which do good for absorption and innovation of suppliers and retailers. Finally, there must be a knowledge-sharing platform so that any staff not only can get in touch with other members in any time, find experts who can provide help and connect to the relevant knowledge quickly, but also can share resources from the partners and get the latest information.

![Figure 2: The process of knowledge sharing](image)

*Joint decision-making system*

Based on the CPFR system, suppliers and retailers could show the enterprise internal planning work to both sides and make the decision together, like the stock plan, the allocation plan, the sales program, and so on, which can realize forecast and replenishment jointly. Its process as follows: Both sides make the business plan, set the demand and supply target, draw up the product sales program and supply plan in retail outlets and complete the union plan. Retailers collect information from various retail outlets and establish demand forecasting and promotional schedule on item-level, while suppliers predict the supply of products at the projection level, exchange information with retailers, complete the joint prediction. Suppliers supply goods according to forecast. Once there is a lack of goods, retailers must issue the necessary replenishment orders immediately. Suppliers respond rapidly and deliver the goods according to replenishment orders, then the two sides complete the joint replenishment. Joint decision-making system can perform the following functions.

1. **coordination**
   Only with the union goal, suppliers and retailers can enhance the performance and obtain comprehensive results. The establishment of joint decision-making system achieves a new type of cooperation, both sides communicate openly, share information, and establish the collaborative
management strategy, which is the only way to achieve long-term development and the good performance for all sides.

(2) Planning
Through the joint decision-making system, it can realize the cooperative planning. In order to achieve a union goal, they make the plan cooperatively, such as promotion plan, inventory changes plan, distribution plan, product introduction and suspended plan, and so on, so as to maximize profits.

(3) Predict
Using joint decision-making system, both suppliers and retailers can make a forecast, thereby reducing low efficiency of the value system significantly, promoting sales and saving the resources. Meanwhile, both sides should be involved in the prediction of the information feedback, modify the model timely, handle the fluctuate and update of the prediction data to make the collaboration more accurate.

(4) Replenishment
Although the joint decision-making system can make a forecast, but it may has a certain error after all, so the joint replenishment is particularly important. This system can realize the rapid reaction of replenishment orders from suppliers to retailers in the shortest time, which is a powerful complement for the forecast.

5 Comprehensive Evaluation of the Improved Model

For the relationship conflict between suppliers and retailers, under the guidance of system collaboration’s thought, an improved model is constructed. Finally there should be the evaluation of the joint-degree for this improved model as the performance evaluation standards of the overall operational efficiency and the basis of the continued joint collaboration between suppliers and retailers. The following use a simple mathematical formulas to explain:

Figure 3: The process of joint decision-making system.
Using $\pi \left( q^0 \right)$ express the optimal benefits function of the new system composed by suppliers and retailers. $\pi_r(q)$, $\pi_s(q)$ express that their actual income of retailers and suppliers, $\pi^0_r$, $\pi^0_s$ express the retained earnings of new system, which are the benefits that they will be able to get but do not need to join the new system. $\pi_r(q) + \pi_s(q) - \pi^0_r - \pi^0_s$ called the remainder of the new system, which is the profit of new system minus the profit before. The existence and rational allocation of the new system remaining is the basis for a collaboration between suppliers and retailers, the formation of collaborative relationships requires not only the existence of the new system left, but also the rational, fairly allocation between suppliers and retailers. And the maximum residue for the new system is $\pi \left( q^0 \right) - \pi^0_r - \pi^0_s$. Thus the joint-degree of this new system is defined as,

$$\text{cop} = \frac{\left[ \pi_r(q) + \pi_s(q) - \pi^0_r - \pi^0_s \right]}{\left[ \pi \left( q^0 \right) - \pi^0_r - \pi^0_s \right]}$$

(1)

In the practical application, as $\pi^0_r, \pi^0_s$ are inconvenient to get, we can also use the following formula,

$$\text{cop} = \frac{\left[ \pi_r(q) + \pi_s(q) \right]}{\pi \left( q^0 \right)}$$

(2)

For example, through some design of contract, purchase quantity of retailers is $q^0$, the new system’s income is equal to suppliers and retailers’ profits. By now, the new system realize the coordination completely. The larger the value is, the better the cooperation's situation is. Therefore the formula (1) is the reasonable measure to the improved model, simultaneously it may also as the foundation of the continued joint collaboration between suppliers and retailers.

6 Conclusion

With the fast-pace growth of China's retail, there appear a lot of large retail enterprises which have the power of holding the channel terminal. Meanwhile, the relational crisis between suppliers and retailers occurred, even deepened. There have been some contradictions, such as forcible replacement of Samsung products, bloodshed against between Mengniu and Carrefour in Zheng zhou, and so on. This is an immature action in the early time of marketing economics in our country, the inevitable choice of suppliers and retailers is to from confrontation to cooperation. This paper describes the relationship between suppliers and retailers, which is competition-oriented error, goal conflict, process conflict, asymmetric information. And there is an effective solution to this problem, namely, under the instruction of system coordination’s thought, establishing the bilateral partner relations, distributing profit rational, sharing risk, enhancing the sharing degree of information and knowledge, making decision together, and optimizing the overall benefit. Meanwhile it constructs suppliers and retailers' improved model, which divides the bilateral union cooperation into three levels, the strategic level, the motivational level, and the business level. Under the instruction of system coordination’s thought, there can form a joint decision-making system on the basis of incentive mechanism and on the premise of both information-sharing and knowledge-sharing, thereby it can achieve a win-win result. At last, the article uses a simple mathematical formula to calculate the coordination degree of the new system as the evaluation of this collaborative and the basis to the continued collaboration. I hope this model can provide a new thought to the further exploration of the relationship between suppliers and retailers, realize the fundamental shift in relations between the two parties and create more surplus value.

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