

The Typology of Carriers by Partnership Intensity and Role in SCM

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Abstract

This study classifies types of carrier in SCM according to partnership intensity and the role of carrier. The authors designate the partnership of low intensity as transactional partnership and that of high intensity as integrated partnership. The level of carrier's role is two types. The one of them is routinized carrier and the other is partnership carrier. By the combination of these, four types of carrier have categorized as transactional, reactive and integrative, proactive, and totally integrated carrier. Then hypotheses on differences in partnership satisfaction and logistics service quality by types of carrier are proposed and tested. This research use survey data acquired from Korean manufactures for analysis. The results show that partnership satisfaction and logistics service quality are highest in the totally integrated carrier group where carriers actively participate in partnership and have lots of roles to perform.

Keywords: *supply chain partnership, partnership satisfaction, logistics service quality, role of carrier, partnership intensity*

1. Introduction

Recently many companies are using 'supply chain partnership' approach as a strategy to sustain competitive advantage. Supply chain includes the physical flows such as transportation, manufacturing, warehousing, and sale. It also encompasses redesigning of new product development, customer service, and customer satisfaction. In fact, these tasks are involved with partnering relationship. The basic dimensions of supply chain are decisions on physical, informational, and monetary flows. And partnership between the parties that are in charge of the flows is the most important part in building and managing supply chain [1].

Supply chain partnership may be able to obtain the highest goals when established from a long-term perspective and managed collaboratively with the participants [2]. Because supply chain partnership is co-work of the newly related companies, more efforts may be put in to be managed successfully and it inevitably can be changed during the implementation. And also unexpected risk can damage the partnership performance. Therefore research on how to improve effectiveness of the relationships between the channel members with some advanced transactional functions is most needed. Such research should focus on the partnership between the companies involved and how to improve the performances through the long-term partnership.

Research on supply chain partnership is composed of two different view-points [3, 4, 5, 6]. One of the research directions is the importance, techniques, determinants, and performance of the supplier-buyer relationship. This approach barely copes with the role and performance of the carriers. Thus its emphasis is only on the earlier format of partnerships. The other

direction is focusing on the relationship between the supplier and the third party logistics companies [7]. This approach only focuses on the relationship between the two parties, and lesser emphasis is on the actual supplier-buyer relationship where the transportation services are provided. Consequently, the previous research has focused on the relationships of supplier-buyer and supplier-logistics companies, thus it cannot show the framework of the role the carrier, which has the crucial impact on the partnership satisfaction and performance. Hereby we propose the necessity of the research on the relationship among the main participants such as supplier, buyer, and carrier.

Supply chain partnership research should take into account the role of carrier to explain more than the simple relationship between the dyads. The previous research of supply chain partnership has been done about the relationship of their participants and determinants of the partnership. Some of the research viewed the transportation function of third party logistics companies may be similar with that of the company-owned transporters. However the performances of the partner company can be varied by the partnership intensity. Thus how the relationship is organized and maintained can differentiate quality of the service outputs.

Recent study discovers that long-term partnership with the core partner is more effective than the relationship with the portfolio of the partners [8]. The strategies of differentiation from the partnership with the core partner can be the devices that can not only down the cost, also up the value of the partnership. From a relationship perspective, this research proposes an integrated framework of partnership among the supplier, buyer, and carrier. This triad framework is designed to show how the intensity of partnership can differentiate the outcomes of the relationship. To develop this research model, the dichotomous role of the carrier (partnership carrier/routinized carrier) and two dimensions of the intensity of the supplier-buyer partnership (transactional partnership/ integrated partnership) are invented.

2. Theoretical Background & Hypothesis

2.1. Supply chain partnership

Supply chain partnership of supplier-buyer can be most effective and efficient when the two parties agree on the terms of trade, goals, policies, and the processes. It is a long-term and ongoing relationship enabling both side can control and coordinate each other through the exercise of their own power. At the same time, each side shares every environmental factors derived from the partnership. When the partners have such values as mutual trust, openness, risk, and reward in common, the service outputs will be synergistically effective. To enhance the performance of the partnership, the relationship between the partners should be equipped with the perspectives of long-term relations and integration rather than short-term relations and single transaction. By this long-term and integration perspective, the participants will gain more of the competitive advantages and able to emphasize the partnership itself.

Until 20 century, the previous studies of supply chain partnership have focused on the role, determinant, and output of the relationship with the ideas to improve the service quality and satisfaction of the partners. These studies didn't place importance on the role of the transporters. In the supply chain partnership research, the relationship between the supplier and the third party logistics company that is the transportation provider has not been to the fore. Specifically, of the function of the third party logistics company, transportation service make up for the large portion. When the third party logistics companies do not own the whole transportation facilities, they make use of outsourcing. By outsourcing the carriers out of the third party logistics company may be involved.

2.2. The role of transportation service in the supply chain partnership

Transportation is one of the most important components of the physical distribution system. The major functions of transportation service are to make raw material procurement, production, tracking, and consumption be connected in an efficient way. Transportation service is beyond the simple delivery of product and service. It requires more complicated decision-making as time goes by. If the transportation service is provided improperly, inadequate service and uncertain delivery time can cause extra stocks and cost. This mismanagement of the transportation section may lower the physical distribution service quality and customer service quality.

The participants of the supplier-buyer relationship are concerned about how to improve the customer-orientation and react sensitively to the customer needs changes. Thus they crave the effective and efficient partnership with the carrier that can give high quality delivery and tracking system. With the tight relationship with carrier, they generate the inter-functional information and foster the flexibility of the planning and implementation on the basis of long-term commitment. The performance of the carrier can be evaluated by the achievements of the role performance such functions as information sharing, sharing of the risk and reward of the relationship, improvements on cost reduction and quality, and long-term commitment. Information sharing of carrier may be achieved by involving frequently in the communication process. These activities may include the ability of carriers to have access to production forecasts or shipping schedules with the connected network of the electronic system of each participant.

Sharing of the risk and reward can be achieved by making clear how to take the responsibilities when the contract is failed or how to manage the service failure, and also preparing devices on the possible changes of surroundings that are to be the sources of risk and reward. Improvement on cost reduction and quality can be achieved when the carrier takes its role as a generator of the ideas to reduce the cost of the partnership system and improve the quality of service. Long-term commitment can be achieved by the active participation of the carrier in the strategic planning program and taking the essential role for the improvements of strategic management performance with a long-term contract.

2.3. Logistics service quality

Logistics service is essential task of supply chain management in that it offers ideas on the whole functions between the raw material procurement to the end-user consumption. By adding more quality services, supply chain can be able to obtain competitiveness [9]. The concept and dimension of logistics quality is varied by the environmental factors and industrial characteristics [10]. In the early days of logistics research, the major measurement were such as product availability, ordering cycle time flexibility, information, system, product management after sale, inventory level, location of facility, network design, timeliness, accuracy of order processing, rates of shipment, speed of error correction, ordering frequency, interaction, order processing, computer ordering system, and so on. These measurements were followed by measurement about the individual customer's demand that is consists of recovery service failure, after service, and response to information request. And recently, logistics service quality factors explained systematically and classified into such dimensions as information quality, ordering process, ordering quantity, timeliness, accuracy, ordering quality, and ordering condition. Ordering and tracking is examined by references of process quality, output quality, and performance quality [11].

Of the logistics service quality dimensions, flexibility, timeliness, and interaction can be achieved by transportation service. To enhance logistics service quality, carrier's role should

be emphasized which can strengthen flexibility, timeliness, and interaction [12]. It means that the crucial factor which determines the logistics service quality is transportation. The previous research has provided the evidence that successful supply chain partnership can gain improved responsiveness for customers and partnership satisfaction. Additionally, higher logistics service quality can create time and place utilities that will improve the timeliness of product delivery and flexible handling of the transportation system, thus it will heighten the usefulness of logistics system.

2.4. Partnership satisfaction

To measure the performance of supply chain partnership, both the financial section and nonfinancial section might be taken into account. However, because the credible statistics regarding the logistics cost is not available, we focus only on the non-financial measurements. The partnership satisfaction is typically used as a nonfinancial performance. Partnership satisfaction reveals the amounts of satisfaction with regard to the experience. The purpose of partnership study is to find out the way to enhance the performance. To measure and assess partnership performance, the previous researches focused on sales, satisfaction, cooperation, asset turnover rate, customer service, margin, and market share individually or in combination. However, because partnership contains aspects of social organization, the boundary for the performance may be broadened wider than the scope of economic sector [13]. Thus we can measure satisfaction as a qualitative item. The evaluation with regard to the transaction between the partners and equity of the reward is described as satisfaction. Satisfaction may include both economic reward and affective reward. Satisfied participants will raise their adhesiveness to the relationship, thus it can be the energy to maintain the relationship [14].

Partnership satisfaction can be defined as how well the result of partnership meets the expectation of the participants [9, 15, 16]. The quality of service provided by the partner viewed as a result of the partnership. The most common attribute of partnership is that it changes from time to time. Ever-lasting efforts are necessary to control and coordinate this variability [17]. When the relationship is composed of single transaction, it may be hard to form partnership. While when the relationship is accumulated, partnership is built and satisfaction can be increased [14, 18, 19]. Thus channel member satisfaction is related to the longevity of the relationship.

2.5. Dimensions by the role of the carrier and partnership intensity

Partnership satisfaction and logistics service quality depend on the role performance of the carriers. In this research, the four different types of carriers are proposed on the basis of both 'role of the carrier' and 'partnership intensity' (Figure 1). When the role of carrier is low, the name of carrier is viewed as passive partnership carrier, and when the role of carrier is high, and then the title of carrier is viewed as active partnership carrier. When the partnership intensity is low, then the name of the partnership is viewed as transactional partnership, and when the partnership intensity is high, then the name of the partnership is viewed as integrated partnership.

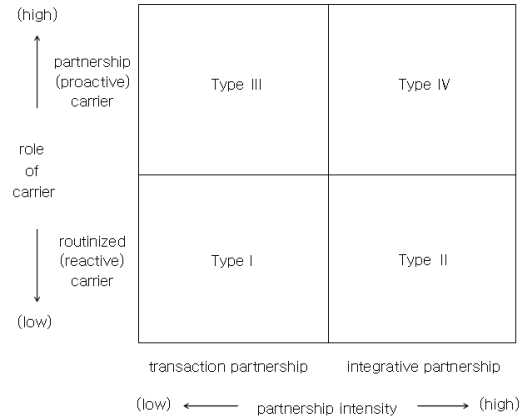


Figure 1. Dimensions of carriers by role and partnership intensity

At the Figure 1, type I carrier is named 'transactional carrier', which has the low level of partnership in the supplier-buyer relationship. On one hand, because of low partnership, even though the participants perceive counterpart as a partner, the focus tends to be short-term orientation. In this case only limited department and function is likely to be involved in the relationship. On the other hand, because the role of the carrier is low and limited, the expectation level for long-term commitment, open communication, sharing of the risk and reward, and cooperation for cost reduction and quality improvement is supposed to be low.

Type II carrier is named 'reactive and integrative carrier', which has on one hand, the high level of partnership in the supplier-buyer relationship and the other hand, the role of the carrier is low. The carriers of this type pursue integration with the other participants and commit long-term relationship. Multi-functions or departments are likely to be involved, however, because the role of the carrier is still limited, the contract tends to be short-term oriented.

Type III carrier is named 'proactive carrier', which has both the low level of partnership in the supplier-buyer relationship and the high level of the role of carrier. These carriers can be expected to achieve higher level of partnership results such as long-term commitment and the like. However the focus of the participants tends to be short-term oriented.

Type IV carrier is named 'totally integrated carrier', which has both the high level of partnership in the supplier-buyer relationship and the high level of the role of carrier. These carriers have strong points of each side, thus can achieve long-term commitment, open communication, sharing of the risk and reward, and cooperation for cost reduction and quality improvement. And the focus of the relationship tends to be on long-term orientation and more departments or functions are likely to be involved.

In summary the types of carrier can affect the performance of the supply chain partnership. By using the logics explained from the figure 1, we propose the following two hypotheses.

Hypothesis 1: Partnership satisfaction will be significantly different regarding the role of carrier and partnership intensity.

Hypothesis 2: Logistics service quality will be significantly different regarding the role of carrier and partnership intensity.

3. Methods

3.1. Operational definition and data collection

The role of carrier is manipulated as long-term commitment, information sharing, trial for cost reduction, trial for quality improvement, and sharing the risk and reward. The measurement items are redeployed from the previous research [20]. Questions are asked to the boundary personnel of manufacturers to evaluate each of the measurement items with regard to the behavior of performance of carriers. Partnership satisfaction is manipulated as how well the expectation of the participant is met [15]. The measurement items are margin from the partnership, cost down, financial performance improvement, customer service improvement, core competitiveness, and overall satisfaction. The respondents are asked to describe how much their expectation and result of the partnership is corresponding. Logistics service quality is manipulated as how much the logistics system contributes to the creation of time and place utility [12, 21]. The measurement items are timeliness of order processing, the adaptation of supply chain to the contingency, speed of response to customers, flexibility to demand changes, and flexibility of transportation services. Long-term orientation is manipulated as the desire to maintain current partnership on a long-term base. The measurement items are perceptions regarding the profitability of the long-term partnership, intention to maintain current partnership, and the amount of effort to maintain the partnership. Respondents were to answer on the Likert-type 5 point scale. To select appropriate respondents, several questions are provided including current relationship with other participants, partnership level, and the role of the carrier. Final respondents consisted of the manufacturers which had the partnership with both more than one distributor and more than either one carrier or logistics company. The boundary personnel in charge of logistics and transportation replied to the questions. A total of 500 questionnaires were distributed and 282 returned. The responses of inadequate companies or respondents were eliminated and finally 218 questionnaires were analyzed with SPSS and Lisrel 8.30 programs.

3.2. Respondents

The gender of the respondents is composed of 142 males (65%) and 76 females (35%). Ages of the respondents are composed of 49 twenties (22%), 93 thirties (43%), 59 forties (27%), and 17 fifties (8%). These demographics are thought to be very general considering the population compositions in Korea. The number of respondents in industrial categories are 14 (6%) of electricity and electronics, 21 (10%) of machinery, mechanics, and steel, 34 (16%) of computer and telecommunication, 38 (17%) of fabric and clothing, 27 (12%) of medicine and pharmacy, 31 (14%) of food and drink, 7 (3%) of petrochemistry, 27 (12%) of car manufacturing, and 19 (9%) of the rest. These compositions of descriptive statistics are well balanced considering the industrial surroundings in Korea.

3.3. Hypotheses test

Hypothesis 1 implied that different level of partnership satisfaction by the four distinctive categories. To examine the differences of partnership satisfaction, ANOVA was used (Table 1). Partnership satisfaction of the each types of carrier were 3.40 for type I, 3.02 for type II, 4.14 for type III, and 4.18 for type IV. As expected at hypothesis 1, these differences were statistically significant, supporting hypothesis 1. And partnership satisfaction of type IV was highest among the four types.

Table 1. ANOVA of partnership satisfaction

Type	Role of carrier	Partnership intensity	N	Mean	S.D.	Duncan test	F- value	P- value
1	Low	Low	57	3.40	0.38	A	116.15	0.00
2	Low	High	44	3.02	0.33	B		
3	High	Low	45	4.14	0.38	C		
4	High	High	72	4.18	0.37	C		

To examine the differences between the four categories, Duncan test was used. Type IV was the highest and significantly different with the rest of three groups. This means that both the high level of the role of carrier and high level of partnership intensity can produce the highest partnership satisfaction. Using the analyzed data, we see the moderating effect of the ‘role of carrier’ on the partnership satisfaction (Figure 2). From the Figure 2, when the role of carrier changes from routinized carrier to partnership carrier, the satisfaction of transactional partnership changes from 3.40 to 4.14, and that of integrative partnership changes from 3.02 to 4.18, reassuring the effects of the role of carrier.

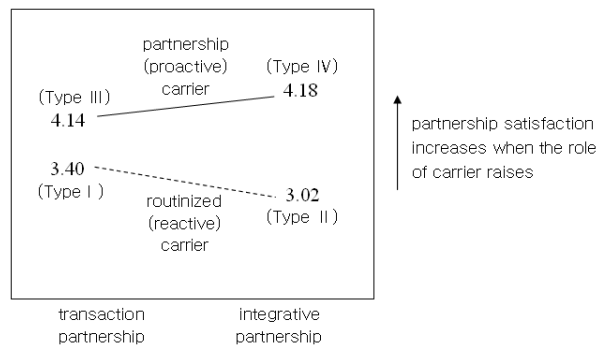


Figure 2. The moderating effect of role carrier on the partnership satisfaction

To examine the differences of logistics service quality, ANOVA was used (Table 2). Hypothesis 2 implies that the four distinctive categories will show different level of logistics service qualities.

Table 2. ANOVA of logistics service quality

Type	Role of carrier	Partnership intensity	N	Mean	S.D.	Duncan test	F- value	P- value
1	Low	Low	57	2.47	0.61	A	108.27	0.00
2	Low	High	44	3.69	0.43	B		
3	High	Low	45	3.49	0.28	B		
4	High	High	72	4.29	0.39	C		

Logistics service quality of each four types of carriers was 2.47, 3.69, 3.49, and 4.29 respectively for the four types, supporting hypothesis 2. Type IV showed the higher means than the others. This is emphasized in that the highest is equipped with the high level of role of carrier by the manipulation. We examined the moderating effect of the ‘role of carrier’ on the logistics service quality (Figure 3). From the Figure 3, when the role of carrier changes from routinized carrier to partnership carrier, the logistics service quality of transactional partnership changes from 2.47, to 3.49, and that of integrative partnership changes from 3.69

to 4.29, reassuring when the relationship is integrated partnership, logistics service quality of partnership carrier is increased more than that of routinized carrier.

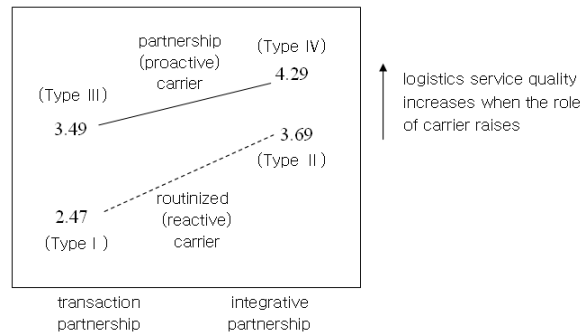


Figure 3. The moderating effect of role of carrier on the logistics service quality

4. Conclusion and implications

Because of hostile competition and various consumer needs, most of the businesses are concentrating on the sustainable competitive advantage. To be more efficient in sustaining competitiveness, partnership is gaining more acceptance as a method of maintaining collaborative competence. Supply chain management is composed of total flows from the raw material procurement through the possible transformational process to complete the product and service to the stock of the end-user. Of the whole process, out-bound logistics management takes care of commercial distribution from the factory to the end-user. Recently, logistics management focuses on the partnership with core partners, instead of managing the relationship with the supplier portfolio, which is the way they did the business practice decades ago. Nowadays more emphasis is on the partner relationship management to enhance marketing performance and sustain strategic competitiveness. This differential approach with the core partner enables qualified logistics performance rather than the mere cost reduction. The previous studies of supply chain management have been focused on two different approaches of supplier perspective and logistics company perspective. Thus these two approaches ignore the carrier perspective. New approach is developed to take in account the triad among supplier, buyer, and carrier. Supply chain partnership deals with two sides both the partnership between supplier and buyer and the partnership between supplier and the carrier. To oversee both relationships, the authors categorized the partnership intensity of supplier-buyer relationship into two parts and the role of carrier, as well. Here, the performance of the supply chain partnership is operationalized as partnership satisfaction and logistics service quality.

Four different groups of partnership were compared with regard to partnership satisfaction and logistics service quality. The satisfaction and quality of the partnership was highest when the supplier-buyer-carrier relationship showed highest commitment level. Regardless of level of the partnership intensity, when the role of carrier rose, then the satisfaction and quality reached the highest among the four groups. The previous studies simply focused on the relationship of supplier-buyer and supplier-the third party. The reason why they ignored the involvement of carrier in the partnership is that it's difficult to measure and verify the triad relationship. In this study, we explored the possible effects of carrier's role in the supply chain partnership. Because the role of carrier was able to affect partnership satisfaction and logistics service quality, the role of carrier may receive increasing attention in the related studies. In this respect, the role of carrier is thought to be important not only as a creator to

foster the relationship between the carrier and individual participant but also to encourage long-term commitment of supplier-buyer partnership. The role of carrier is perceived to encourage the logistics partnership rather than simply raise logistics service quality.

The results of survey indicate that the more the role of carrier is emphasized the more the partnership satisfaction and logistics service quality will be increased. If the business practices will achieve these ideas, the role of the carrier will be placed at the highest priority of budget and task. From the carrier's perspective, the win-win strategy to come along with the partners is needed to be developed to cope with the rapidly changing surroundings. In this study, the types of carriers were determined by two bases, one thing partnership intensity of supplier-buyer relationship another role of carrier. These combinations of bases include every possible transportation services rather than the simple and single mode of rail, airplane, ship, and road. When the role of carrier is divided into high and low, the strategic directions of partnership can be produced in detail. Because the role of carrier is composing carrier may be influenced more of the factors such as ability and characteristics of carrier, carrier's relationship with the other participants, and partnership intensity where the carrier is involving. And newly manipulated measurement items of the role of carrier can serve as a useful device for the practical field management.

In the further study, the four dimensions developed in this study can be applied to the specific industries where the role of carrier can be the multiplier for the goal of the supply chain partnership. With regard to the different types of supplier or manufacturer, the role of carrier can differently affect the satisfaction and quality of the partnership. Thus if new framework for the four dimensions is proposed, then it will facilitate to develop different strategic directions. For example, specific product category may be examined to classify the types of partnership. In this case, as is the usual case, the specific tendency or distinctive characteristics of product can be new bases for the segmentation of the dimensions. For the development of new dimensions which will replace the four dimensions, we propose market-orientation, customer-orientation, and the willingness to perform strategic marketing activities and so on.

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