

The impact of Inter-organizational information system on the investment strategy of different organization

Chiu-Jung Chen¹ Li-Ling Hsu^{2*}

¹National ChiaYi University

²National Kaohsiung First University of Science and Technology

Abstract

Specificity investment of Inter-organizational System (IOS) is getting more and more important to forge an alliance among enterprises. One of the most popular ways which inter-organizational enterprises adopted is the alliance on the basis of information technology. Although the alliance on the basis of information technology enhances corporate performances, enterprises still evaluate the benefits and risks carefully in order to prevent huge losses. The theory of this research is based on the level of specialized investment, Transaction Cost Theory and Resource-Based Perspective. The four electronic and steel companies have strategic alliance with the others. Two are electronic companies and two are steel. The four companies are chosen to do two pairs in two industries, competitive analysis. The result indicates that the domestic contractors adopt the strategy of specialized investment of IOS because of the request from customers.

Keywords: Supply Chain; Specificity investment; Transaction Cost Theory

1. Introduction

Many researchers have been carried out on the issue of coordination mechanisms within the supply chain and have demonstrated the improved outcomes of supply

chain coordination [1]. For example, innovative programs such as concurrent engineering, vendors-managed inventory, postponement and quick response (QR) are suggested by practical as well as academic fields to effectively reduce the inefficiency and to create flexible values in the supply chain [2]. To be effective, these supply chain improvement programs require not only strategic and operational levels of coordination efforts, but also sustained and closed cooperative relationship [3]. As a result, supplier selection and supplier improvements become the important supply chain management strategies when a firm seeks to keep or tighten the relationship between trading partners and themselves [4-6]

2. Literature Review

Firm might coordinate and manage inter-organization activity through inter-organizational information system of partner to response product shortening delivery requests from customers [7]. SCM helps a lot in coordinating contribution for electronic firms, especially in technology and management integration [8]. However, creating an innovated inter-organizational information system always contains strategic problems about which firm should be charged in the investment and how to distribute the new creative value in the future and so on [9]. The integration and coordination of inter-

organization management is the key problem of SCM. Therefore, inter-organization management becomes the focus of cross-filed research from now on.

Although Strategic alliances achieve extraordinary outcomes, maintaining closer collaborative relationship is not without risks. Strategic advantages through an IT-based alliance requires a merging of complementary interests, sharing of privileged information, and intimate collaboration and cooperation, which increases extra investments in capital to support the dyad's efforts [10]. It reduce bargaining power and increase individual firm's exposure to opportunistic behavior by its respective partner. The fundamental assumption underlying partnership or closer collaborative relationship is that this kind of relationship makes both the manufacturer and suppliers better off than when there is no such relationship [11]. Below two conditions must be maintained for sustaining a long-term partnership. The first condition is that the joint profits attained through the coordination must be larger than the sum of uncoordinated individual profits [12]. The second one is that at least in the long run, each individual participant in the supply chain must perceive that its allocated profit is larger than attain with no such coordination [13]. If the outcomes of dedicated coordination efforts not able to generate extra-revenue or values from outside the supply chain, any efficiency gains within the supply chain not be sustained, since they are traded off between the chain participants [11].

Resource-based view of firm is drawn upon, where a long-term alliance relationship and idiosyncratic investments are derived, and pie-expansion outcomes are created. Nevertheless, these are several conditions which firms might not favor these “pie-expansion” efforts. Therefore, this study goes on to investigate the impacts of idiosyncratic investments on the

adaptability/strategic flexibility of governance mechanisms. Interestingly, it has been validated through empirical tests that a high level of idiosyncratic investment decrease exit flexibility and increase modification flexibility [14]. As a result, firms need to face a trade-off between pie expansion efforts and profit, and decide which kind of strategic flexibility is needed to maintain in strategic alliances. To answer this question, this study further examines the effects of uncertainty on transacting firms' preference for flexibility. In addition, when we classify environmental uncertainty originated from different sources, the preferences of firms for flexibility also varies.

3. Research Model

Two electronic and two steel companies were chosen as the interviewees of this study. This study adopts multiple case studies to discuss the strategy of specialized investment of Inter-organizational System (IOS). Through multiple case studies, we discuss the strategic alliance with specialized investment of IOS. In the end, we infer the strategy as the reference materials for alliance.

This study mainly focuses on three dimensions: IT/IS Specific Investments, Buyers' Uncertainty, and Sellers' Uncertainty. Construct the model and 16 hypotheses.

4. Result

A positive correlation between a high level of IT/IS idiosyncratic investments and buyer-supplier relationship. The study shows that if the relationship between buyers or suppliers is intimate, both parties are more to invest in IT/IS idiosyncratic capital, and the benefits accrue to it increase as well. Meanwhile, the idiosyncratic investment made in IT/IS capital is correlated to modification and

exit flexibility. The companies interviewed indicated they were more inclined to modification alliance rather than exit alliance, after the investment of IT/IS capital, if the IT/IS capital not exert any influence on strategic flexibility or the investment is intervened by other factors. Take Company A as an instance. It chose to exit alliance with suppliers who encounter uncertain difficulties, regardless of the fact that they had invested in IT/IS idiosyncratic capital.

Modification in Alliance is desired under Highly Environmental Uncertainty. The findings show that Company A, B, C, and D either modify or maintain alliance as there is a low environmental uncertainty. Therefore, H1 and H3 are supported. Nevertheless, the authority of exit/modification alliance resides in the buyers. A large majority of manufacturers would choose the policy of modification alliance. If they take the lead in a supply chain, such as Company A and Company C, they would choose to exit alliance with customers who do not have significant influence on the revenue. As a result, H5 is partially supported, and H7 is fully supported.

Exit or Maintenance in Alliance is desired under Highly Technological Uncertainty. The findings show that Company A, B, C, and D prefer exiting or maintaining alliance under highly technological uncertainty. As a result, H9 and H11 are supported. Meanwhile, buyers usually take the lead in selecting exit or modification alliance. From a manufacturer's point of view, a high modification alliance is desired, when the technological uncertainty exists. As a result, H13 and H15 are not supported.

Under a highly environmental uncertainty, Company A, B, C, and D would choose to modify or maintain alliance with suppliers. Therefore, H2 and H4 are fully supported. In this case, it is manufacturer taking the lead in the selection of

alliance types. For them, a high level of idiosyncratic investments leads to a high level of interaction between the buyer and supplier. As a result, H8 is fully supported. To the contrary, a low level of IT/IS investment represents a low level of interaction between the buyer and supplier, in which case, Company A and Company C would exit alliance with suppliers, but Company B and Company D would modify alliance with suppliers, i.e. the headquarter. As a result, H6 is partially supported.

All the companies interviewed would exit or maintain alliance with suppliers, as the level of technological uncertainty is high. As a result, H10 and H12 are fully supported. Under technological uncertainty, it is manufacturer determining the alliance types. In Company A and Company C's case, they would modify alliance, but Company B and Company D would choose to exit alliance with suppliers. Therefore, H14 is fully supported.

From the analysis of interview data, found out that the degree of A and B companies of information/ electronic industry which are affected by the technological uncertainty are lower than the C and D steel industry. After extensive comprehension, discovering that A and B information electronic industry has a low level of technique that this study interview. Therefore, it was highly affected by technological uncertainty. Such as the A Company is IC backend packaging OEM. However, the B Company is the agent of packaging and device. It is not highly affected by technological uncertainty as well. On the contrary, though the C and D steel industry are quite mature and steady, when facing the technological uncertainty factor of command critical technology, material, processing technology and mass production, they gains the average score of 4.38. It is obviously higher than A and B company which is 2.93.

5. Conclusions

With IOSs, upstream suppliers are able to estimate forecasts and plan subject to customer forecasts in advance, and feedback to downstream suppliers in a timely manner for production [15]. Moreover, e-commerce allows firms to offer suppliers a complete supply status of the entire supply chain, so that every node in it be planned and managed timely and accurately, and resources are fully integrated [15]. IOSs offer visibility of information, which helps reduce inventories at each node of supply chain and increase the speed and agility to react to market demands. In a nutshell, the effective practice of IOSs in support of organizational strategies to achieve the overall benefits of an IOS is a major determinant to improved competitive advantage that excels competitors [16].

In order for supply chain members to enter into alliances, it is prerequisite for them to share resource/information, which leads to the reduction in inventory and cost, especially the cost of ‘guessing’. Nevertheless, the practice of alliance partnerships between suppliers and buyers is extremely difficult, especially when they are both competitive and cooperative partners. As such, sharing the same resource and information between supply chain members is one of the keys to successful IOS.

References

- [1] Rai, A.; Patnayakuni, R.; Seth, N., *MIS Quarterly*, (2006) **30**, 225.
- [2] Premkumar, G.; Ramamurthy, k.; Saunders, C. S., *Journal of Management Information Systems*, (2005) **22**, 257.
- [3] Wen-Bao, L., *Expert Systems with Applications*, (2008) **35**, 661.
- [4] Lambert, D. M.; Cooper, M. C., *International Marketing Management*, (2000) **29**, 65.
- [5] Garca-Dastugue, S. J.; Lambert, D. M., *Industrial Marketing Management*, (2003) **32**, 251.
- [6] Tage, S. L.; Herbert, R.; Martin, G., *Industrial Marketing Management*, (2003), 199.
- [7] Susan, L. G.; James, H. F.; John, T. M., *Journal of Business Logistics*, (2003), 57.
- [8] Cagliano, R.; Caniato, F.; Spina, G., *International Journal of Operations & Production Management*, (2003) **XXIII**, 1142.
- [9] Jap, S. D., *Journal of Marketing Research*, (2001) **XXXVIII**, 86.
- [10] Dyer, J. H.; Singh, H., *Academy of Management Review*, (1998) **23**, 660.
- [11] Kim, B., *European Journal of Operational Research*, (2000) **123**, 568.
- [12] Kim, K. S.; Knotts, T. L.; Jones, S. C., *Expert Systems with Applications*, (2008) **34**, 128.
- [13] Wang, W.-K.; Huang, H.-C.; Lai, M.-C., *Expert Systems with Applications*, (2008) **34**, 1795.
- [14] Young-Ybarra, C.; Wiersema, M., *Organization Science*, (1999) **10**, 439.
- [15] Williamson, E. A.; Harrison, D. K.; Jordan, M., *International Journal of Information Management*, (2004) **24**, 375.
- [16] Hsu, L. L., *Industrial Management & Data Systems*, (1999) **99**, 147.