



Resource fit in inter-firm partnership: intellectual capital perspective

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Abstract

Purpose – Previous studies on strategic alliance and network have not paid sufficient attention to resource fit based on intellectual capital perspective. This study aims at understanding the input resources and transformation in a dyadic inter-firm partnership, given different types of value logics.

Design/methodology/approach – This study adopts a multiple case study approach by in-depth interviews in three inter-firm cooperative cases, which represent three different types of value-creating logics – value chain, value shop, and value network. This study applies the intellectual capital navigator (ICN) to analyze the resource transformation among human capital, organizational capital, relational capital, physical capital, and monetary capital that was produced by two sides in three inter-firm partnerships.

Findings – The results show that: given value chain logic, while the inter-firm partnership emphasizes standardization, efficiency and economy of scale, resource fit in physical, monetary, and organizational capital forms the basis of value creation; given value shop logic, while the inter-firm partnership emphasizes problem solution and economy of scope, resource fit in human and organizational capital forms the basis of value creation; and, given value network logic, while the inter-firm partnership emphasizes network economic behavior, resource fit in human, organizational, and relational capital forms the basis of value creation.

Research limitations/implications – Taking the unit of analysis at dyad level, this study demonstrates the detailed resources contributed by the focal company and its partners based on different value logics.

Practical implications – This study extends the use of the intellectual capital approach for analyzing the resource fit in the inter-firm context.

Originality/value – Theoretically, this study contributes as a starting-point for analyzing the resource input and transformation in the inter-organizational context by using an intellectual capital approach. Practically, this study contributes to more practical references so as to reveal, given different types of value-creating logic, how two partnering companies can manage and deploy their intellectual capital and traditional resources in order to fit in the inter-firm cooperation.

Keywords Intellectual capital, Organizations, Partnership, Resource management, Value analysis

Paper type Case study



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Introduction

In the field of strategic management, strategic fit is a core concept in normative models of strategy formulation (Zajac *et al.*, 2000), and the pursuit of strategic fit has traditionally been viewed as having desirable performance implications. Scholars have proposed conceptual frameworks to explore the strategic fit. Two concerns of mainstream strategy research are to explain what determines firm performance and what affect firm strategy (Farjoun, 2002). From the internal aspect, strategy coordinates goals and means, internal resources and administrative infrastructure, which constitute internal strategic fit. Scholars such as Yin and Zajac (2004), Wright and Snell (1998), Parthasarthy and Sethi (1992) have put their efforts on internal fit. They have studied strategic fit focusing on how firms reach strategic fit between strategy and internal factors such as structure and resource. However, as inter-firm cooperation has become one of the dominant strategies, none of them emphasizes the strategic resource fit and resource transformation in the context of inter-organizational cooperation based on an intellectual capital (IC) perspective.

Scholars interested in alliances and networks have recognized the knowledge and resources from partners and their links with competitive success. Although there is a well-established body of literature underscoring important correlation between resource and inter-firm cooperation (Inkpen and Tsang, 2005), little attention has been paid to understanding the resource fit between partners, in terms of ICs. Although various variables that affect network resource exchange and transfer have been posited, such as firm intent, absorptive capacity, and control system (Inkpen and Tsang, 2005), prior studies failed to examine how a pair of cooperative firms individually contribute their ICs and create resource fit for cooperative relationship.

Barney (1991) presented a comprehensive framework to identify the needed characteristics of firm resources to generate sustainable competitive advantages. According to Hoskisson *et al.*'s (1999) analysis, one of the criticisms of Barney's framework is that the framework does not account for boundless resources. To remedy this, some scholars, for example, Grant (1991), Black and Boal (1994), propose that resources are nested that have specific interrelationships and that there is a need to examine the dynamic interrelationships among resources. In this study, we argue that partners' commitment of resources does not guarantee that they both benefit from the partnership. Particularly in the context of a cooperative relationship, resources do not create value unless they were deployed, transformed, and combined appropriately and effectively. In order to benefit from inter-firm cooperation, not only the resource commitment between partners is essential, but also the resource transformation for collective value creation.

From the intellectual capital management (ICM) perspective, firms should deploy and manage their IC resources in order to maximize the value creation. The process of resource transformation may vary with different value-creating logics of firms. This is true for IC resource management not only within the boundary of the firm, but also in the inter-firm partnership. Therefore, this study focuses on the resource transformation at the inter-organizational level rather than at intra-organizational level to understand how inter-firm partners individually deploy their ICs and how the contributed resources can transform between partners so as to meet with value creating logics.

This study tries to link the concept of strategic resource fit and IC perspective. The following research questions were raised:

- (1) Given different types of value logics, what are the IC and traditional resources contributed by two partners in a dyadic inter-firm partnership? What is the relative importance of each input resource?
- (2) Given different types of value logics, what is the representation of resource transformation in the dyadic inter-firm partnership?

By applying an analytical approach, intellectual capital navigator (ICN), this study investigated three inter-firm cooperative cases representing three different types of value-creating logics. The next section addresses theoretical backgrounds. Research setting and data collection are then described in the third section, which is followed by the detailed IC transformation in three cases of the results and discussion section. The last section summarizes research findings and contribution.

Theoretical backgrounds

IC perspective

In the field of strategic management, the resource-based view (RBV) has emerged as a widespread application and important research approach (Acedo *et al.*, 2006). A fundamental question for strategy researchers is the utilization of the RBV in developing meaningful management tools in the form of actionable prescriptions for practitioners (Nohria, 1992; Mosakowski, 1998, Priem and Butler, 2001). From the RBV, Eisenhardt and Schoonhoven (1996) view alliances as “cooperative relationships driven by a logic of strategic resource needs and social resource opportunities.” A firm may acquire its essential resources from inside and outside the boundary of the firm. Not only building internally on its own but also obtaining externally from alliances or networks can a firm extend its resource base (Peng *et al.*, 2006).

Barney (1991, p. 101) defines firm resources as firm attributes that may enable firms to conceive of and implement value-creating strategies. Of all different kinds of resources, intangible assets are considered the most important resources for value creation. In line with the RBV, IC represents as valuable, intangible and inimitable resources for facilitating productive activities and value creation of a firm (e.g., Roos *et al.*, 2005; Nahapiet and Ghoshal, 1998; Bontis, 1998; Roos and Roos, 1997). Grounded in an RBV logic, IC-based view (ICV) represents one specific aspect of the more general RBV, in that it more narrowly considers intangible resources that have been theoretically linked to a firm’s competitive advantage (Reed *et al.*, 2006). ICV focuses on the stocks and flows of intangible resources embedded in an organization, and is posited to have direct associations with financial performance (Youndt *et al.*, 2004).

Scholars have proposed various categorizations to classify IC (e.g., Johannessen *et al.*, 2005; Edvinsson and Sullivan, 1996). Despite considerable apparent differences and overlaps among those categorizations, the broad domain coverage is basically the same. In accordance with Roos *et al.* (2005) definition, IC can be classified into human capital (HC), organizational capital (OC) and relational capital (RC). HC relates to all the resources embodied in the individual employed by or linked to the organization in a way that makes it possible for the organization to deploy these resources (Roos *et al.*, 2005, p. 76). OC relates to all the resources that the organization has developed or produced and that the organization legally owns that are not physical in nature, e.g. brands, image, reputation, processes, routines, systems, structures and information in databases or on paper (Roos *et al.*, 2005, p. 30). RC resources encompass all those

relationships the organization has with entities outside the organization and that influence the organization's ability to create value (Roos *et al.*, 2005, p. 74). Reed *et al.* (2006) adopted the similar classification, proposing that IC consists of three basic components: human, organizational and social capital.

Value-creating logics

In order to understand the economic behaviors of firms for value creation, it is necessary to analyze the value-creating logics, which describe the economic behavior of the resources deployed by the firms. Based on Thompson's (1967) typology of long-linked, intensive, and mediating technologies, Stabell and Fjeldstad's (1998) typology of value chain, value shop, and value network are three distinct generic value configuration models for understanding and analyzing firm-level value creation logic, as follows:

- (1) *Value chain*. A value chain model is a long-linked technology where value is created by transforming inputs into products. This type of value creation relies on standardized process and repetition (economies of learning) and mass production (economies of scale). The activities executed in the value chain logic are sequential and linear. The major driver of cost is scale, capacity utilization and economics of both internal and external scope. For firms with value chain logic, relationships between scale, capacity utilization, market scope, and uncertainty in input and output markets are the critical generic determinants of the strategic position.
- (2) *Value shop*. A value shop model relies on an intensive technology to solve a customer or client problem. Value information asymmetry is the important attribute of an intensive technology. Clients problem often involve more or less standardized solutions, but the value creation process is organized to deal with unique cases. The professional often has standard information acquisition procedure to make sure that the problem has been correctly framed. Therefore, this type of value creation relies on the ability to continuously reconfigure a given resource portfolio to address economies of scope. The activities executed in this logic are cyclical and sequential, and reciprocal.
- (3) *Value network*. A value network model relies on a mediating technology to link clients or customers who are or wish to be interdependent. The mediating technology facilitates exchange relationships among customers distributed in space and time. That is, linking and value creation in value networks is the organization and facilitation of exchange between customers. Thus, the basis for value creation lies in connecting people or organizations. This type of value creation relies on balancing network economic resources. The activities executed in this logic are parallel and non-linear. For firms with value network logic, value is derived from service, service capacity, and service opportunity. Therefore, scale and capacity utilization is a potential driver of both cost and value. Mediation activities are performed simultaneously. Standardization enables the mediator to match compatible customers and to effectively maintain and monitor the interaction between them.

Based on the IC perspective, the process of managing IC emphasizes on the value creation of the organizations. Differences in value creation reflect different economics.

While the chain has a cost orientation, the shop is oriented towards value. The value network needs to balance cost and value as scale and value as scale and capacity utilization are drivers of both (Stabell and Fjeldstad, 1998, pp. 433-4). Therefore, it is important to identify what value-creating logics mean for the organization. For each of the activities in the different logics, the requirements for resource deployment and transformation are different (Roos *et al.*, 2005, pp. 43-7).

Resource transformation in inter-firm partnership

All resources, including knowledge, are created through combination and exchange. Allee (2008) proposed the concept of value conversion, which is the act of converting or transforming financial to non-financial value or transforming and intangible input or asset into a financial value or asset. Whenever one type of value has been created or realized from another type of value, a value conversion has been executed. In the cooperative relationship, the anticipation of or receptivity to learning and new knowledge creation has been shown to be an important factor affecting the success of strategic alliance (Hamel, 1991). Das and Teng (2000) assert that the overall rationale for entering into a strategic alliance is to aggregate, share, or exchange valuable resources with other firms when these resources cannot be efficiently obtained through market exchanges. This outcome is often referred to as synergy, which is driven by factors such as sharing resources. In order to realize the benefits, production has to be rationalized, systems have to be developed to share information or move people, and marketing efforts have to be coordinated (Shaver, 2006). Particularly in a cooperative network in that participants create value collectively, participants utilize their tangible and intangible asset base by assuming or creating roles that convert those assets into more negotiable forms of value that can be delivered to other roles through the execution of a transaction (Allee, 2008). Therefore, IC fit and resource transformation is critical for cooperative success.

Given a cooperative strategy, on one hand, the interactions with and learning from alliance partners enable firms to improve their capabilities and to expand their resource endowments that will further enhance their competitive advantages (Hitt *et al.*, 2000). As Dyer and Singh (1998) suggest that the competitive advantages of partnerships are generated from substantial knowledge exchange and the combining of complementary but scarce resources or capabilities. On the other hand, knowledge-sharing routines and relational mechanisms that enhance collaboration and mitigate appropriation hazards in alliances are primarily partner-specific (Gulati *et al.*, 2003). Because partners with either homogeneous or heterogeneous resources linked together, resource exchange, sharing and transformation between partners is especially critical to achieve a collective goal.

Based on the IC perspective, resource fit largely depends on a match between types of IC resources (Roos *et al.*, 2005). The concern about how to coordinate diverse production skills and integrate several technology streams has been the complex ways in which exchange contribute to the creation of IC (Nahapiet and Ghoshal, 1998). Therefore, IC management has become an even more essential and challenging issue in the inter-firm cooperation.

Despite scholars emphasize the importance of resource fit and transformation in strategic alliances, only very few of them adopted IC perspective in the inter-organizational context. For example, according to knowledge-based view,

Grant and Baden-Fuller (2004) proposed the efficiency of knowledge integration and knowledge utilization in alliances. They argue that efficiency of integration is maximized through separate firms specializing in different areas of knowledge and linked by strategic alliances. If different types of knowledge have different product domains, the problem of fits arises between the firm's knowledge domain and its product domain. The greater the uncertainty as to the future knowledge requirements of a firm's product range, the greater its propensity to engage in inter-firm collaborations as a means of accessing and integrating additional knowledge.

Huang and Chang (2008) examined the innovation process in the supplier-manufacturer relationship, in which they focused on joint problem-solving capability, trust, and innovation. However, they did not incorporate more IC resources in the study. Another example is a study done by Joia and Malheiros (2009), who examined the impact of strategic alliances in the formation of firms' IC resources, in terms of HC, internal process, innovation capacity, and relationship capacity.

Both of these studies were conducted by a survey method, however, they took the perspective from one-side aspect but not both-side aspect to examine the resource transformation. The Schotter and Bontis' (2009) study emphasized the capability transfer in intra-organizational context. Conducting by case study, they identified antecedents and barriers for reverse capability-transfer in multinational corporations. They focused on the autonomy, the mandate, the development process of new capabilities, and the capability exchange within the company network, but not on detailed capability transferring. Therefore, this study extends the scope of those prior researches by linking IC and strategic alliance and adopting IC approach to reveal the detailed resource transformation at the dyadic partnership from both sides.

ICN

The ICM is defined as the deployment and management of IC resources and their transformations (into other IC resources or into traditional economic resources) to maximize the present value of the organization's value creation in the eyes of its stakeholders (Roos *et al.*, 2005, p. 42). According to the ICV, one component of intellectual can leverage the value of resources in the other components (Reed *et al.*, 2006). The presence of resource is not sufficient to create value. Going beyond the mere presence of a resource, IC considers the organization's ability to transform one resource into another (Roos *et al.*, 2001). Therefore, the primary concept of ICM is to identify and evaluate the organization's resource transformation structure.

Roos and Roos (1997) propose the ICN, which then further refined by Roos *et al.* (2005). The ICN is a numeric and visual representation of how management views resource deployment to create value in the organization and about identifying transformations from one resource into another. By mapping how resources influence each other, the ICN provides an overall map of the logic used by management when it comes to resource deployment in a given organization. Moreover, In order to understand the value conversion and utilization of intangible assets, Allee (2008) proposed the technique of "value network analysis" to map out the value exchanges in that three elements are depicted: roles, transactions, and deliverables.

In the value network analysis, roles are played by participants in the network who provide contributions and carry out functions; transactions originate with one

participant and end with another; whereas deliverables are the actual things that move from one role to another. On the map of value network analysis, the nodes depict the roles and the arrows indicate the transactions through which deliverables are conveyed from one role to another. In this study, we follow the technique of ICN and value network analysis to represent the resource transformation in inter-firm partnership.

The study

According to Hoskisson *et al.* (1999) analysis, the unobservable poses a substantial measurement challenge to RBV researchers. Because intangible resources are more difficult to measure, RBV researchers have used proxies as measures of intangible construct. However, proxies may not be valid measures for underlying constructs. Therefore, the method of research using large data samples and secondary data sources appear to be inadequate, particularly when used to examine intangible resources, such as tacit knowledge (Zander and Kogut, 1995). Given that we do not know very much about the contents of IC resource transformation at the dyadic level, our intention is to provide new exploratory evidence grounded in an in-depth case study to give an insight into what is occurring. As Hoskisson *et al.* (1999) indicate, calls for the use of qualitative methods to identify a firm's resources are increasing as each firm is considered to have a distinctive bundle of resources. The case study methodology may be appropriate for the RBV research because it can provide much richer information about the firms' idiosyncrasies.

Research setting

This study focuses on the resource transformation between cooperative partners particularly from the IC perspective. The unit of analysis in this study is at the dyad level. In this study, we investigated three inter-firm cooperative projects that were executed by the focal company – ACE geo-synthetics Co., Ltd. ACE was established in 1996 and equipped with the first automatic production line in Taiwan for geo-grid manufacturing. The geo-grid provides high resistance to soil micro-organisms and chemicals, UV radiation and mechanical damage. Because of the installation flexibility, using geo-grid withstands earthquakes better than traditional methods. The annual production of ACE has exceeded 8 million square meters, which makes ACE become the leading company in the Taiwanese domestic market.

Recently, ACE has dedicated itself to develop the application of construction. ACE serves not only domestic market in Taiwan, but also international markets over 40 more nations in the USA, South America, Europe, and Asia. In this study, we explore the resource transformation in inter-firm partnerships by three inter-firm cooperative cases:

- (1) A dyadic cooperation between ACE and a turnkey machinery supplier offering services in automatic production line (Partner A), representing as a value-chain case.
- (2) A dyadic cooperation between ACE and an engineering consulting company (Partner B), representing as a value-shop case.
- (3) A dyadic cooperation between ACE and a labor agent company (Partner C), representing as a value-network case.

Research approach

Resource transformation. Based on IC perspective, resources were classified into five categories. Three of them are IC resources: HC, OC, and RC. Two of them are traditional resources: physical capital (PC) and monetary capital (MC). The presence of resource is not sufficient to create value. IC considers the organization's ability to transform one resource into another (Roos *et al.*, 2001). To create value, resources need to be deployed effectively and efficiently, to be put into a structure where one type of resource is transformed into another type of resource (Roos *et al.*, 2005). In this study, the ICN approach is used for analyzing the resource transformations between cooperative partners.

The resource transformation analysis was done in four steps. First, in the partnership, the informants from both focal company side and partner side have identified the resource elements in five categories that were contributed to the partnerships. Second, the informants measured the relative importance of resources, which gives the weight of each resource element. Third, the informants evaluated resource transformation from each party. For example, the informants in the focal company were asked to identify the resources transformation from focal company to partners. On the other side, the informants in partnering companies were asked to identify the resource transformation from partner side to focal company side. Fourth, the ICN was then analyzed in accordance with the resource importance and transformation that were evaluated from both parties.

Data collection

We collected data by in-depth face-to-face interviews. In order to control the respondent bias, we interviewed with eight informants including both focal company side and partner side. All the informants are the key persons in charge of those cooperative partnerships. Most of them are senior managers with eight to 30 years of experiences in their expertise. Table I shows the backgrounds of the informants and the times of interviews.

Results and discussion*Value chain: Case I*

Inter-firm partnership with value chain logic. The type of value chain logic relies on a standardized process and mass production. This logic has an inherent drive toward

Case	Informants	Expert areas	Experience (years)	Interview	Time (hours)
I	ACE – vice president	Textile technician management	26	Face to face	10
	Partner A – vice president	Mechanical design	20 plus	Face to face	8
II	ACE – sales manager	Civil consultant/sales management	15	Face to face	6
	Design engineer	Civil engineering design	3	Face to face	10.5
	Partner B – general manager Manager	Civil consultant Civil engineering design	30 plus 8	Face to face Phone	6 6
III	ACE – HR manager	HR relations	3	Face to face	8
	Partner C – manager	Foreign-labor service	10	Face to face	8

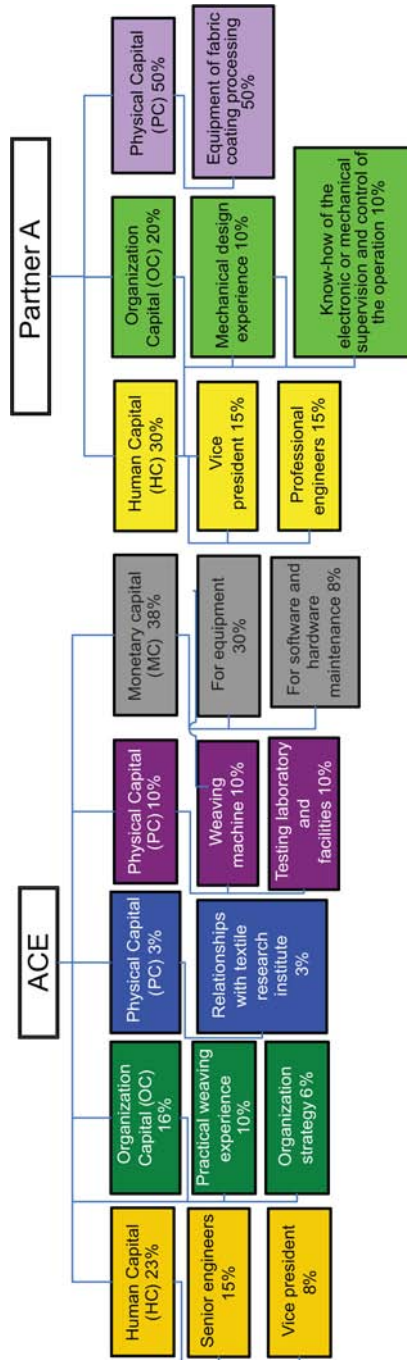
Table I.
The backgrounds of
informants

efficiency, meaning that the resources form the basis for a competitive advantage of economies of scale (Roos *et al.*, 2005). This study investigated Case I as an example of value chain logic. Case I refers to an inter-firm partnership between ACE and a turnkey machinery supplier offering services in the automatic production line (Partner A). In the early years when ACE was a traditional family business supplying agricultural grid, in order to diversify into the industrial-used geo-grid area, ACE had been struggling with a try-and-error process for survival. The lack of know-how and experience led to the unfavorable consequences such as unstable quality, inefficiency, and large waste. In 1999, ACE was equipped with fabric coating facilities for improving quality control in tension stability, heating temperature, and natural curling. With experience in design and assembly of an automatic production line, Partner A and ACE collaborated to develop coating and heating equipment that were designed to integrate originally separated production processes into an integrated sequential process. Benefiting from the cooperation, ACE was enabled to achieve higher production efficiency and quality stability whereas Partner A improved its technical applications in different business areas.

Contributed resources and transformation in the partnership. In this partnership, ACE contributed more MC (38 percent) and HC (23 percent) than PC (20 percent) and OC (16 percent). ACE also input a little RC (10 percent). In the category of MC, ACE invested its money in equipment such as an electric oven, transmission rollers, and fabric coating equipment. As for HC, senior engineers and the vice-president, also an expert engineer, all worked together on adjustments of production automation and optimization of weaving machines. Some R&D data were also provided to partner A as advice and references for customization. ACE also contributed its RC for research and development.

On the other side, Partner A contributed PC (50 percent), HC (30 percent), and OC (20 percent). In order to join some co-development projects with ACE, Partner A assigned engineers (15 percent) and the vice president (15 percent) to actively participate in conference meetings. Based on their well-experienced automation design, the engineers from Partner A are able to propose useful approaches. In addition, Partner A input in the OC included mechanical design experience, know-how of the electronic or mechanical supervision, and knowledge of operation control. Figure 1 shows the resources and relative importance contributed to the partnership in Case I.

Tables II and III show the transformation matrices from ACE to Partner A as well as from Partner A to ACE. According to the results in Tables II and III, Figure 2 depicts the resource transformation of ICN in this partnership. How did ACE benefit from Partner A's resource transformation? As can be seen, the PC contributed from Partner A has transformed into ACE's PC and HC, which strengthened the capabilities of ACE's engineers. The HC and PC contributed by Partner A was transformed into ACE's OC and PC, which enhanced the automation technology and reduced the defect rate in ACE. On the other side, how did Partner A benefit from ACE's resource transformation? The HC such as senior engineers and investment in physical assets from ACE was transformed into Partner A's HC and physical assets, which allowed Partner A to improve know-how and experience in production automation and then apply the knowledge to other similar industries.



Resource fit in inter-firm partnership

Figure 1. The resources contributed to the partnership in Case I

Value shop: Case II

Inter-firm partnership with value shop logic. The type of value shop logic focuses on solving a problem for the client. The value in this type resides not only in the solution itself, but also in the individuals who came up with the solutions and the way they reached it, implying that HC and OC are sources of competitive advantages. A firm with this value shop logic should enhance its ability to continuously reconfigure a

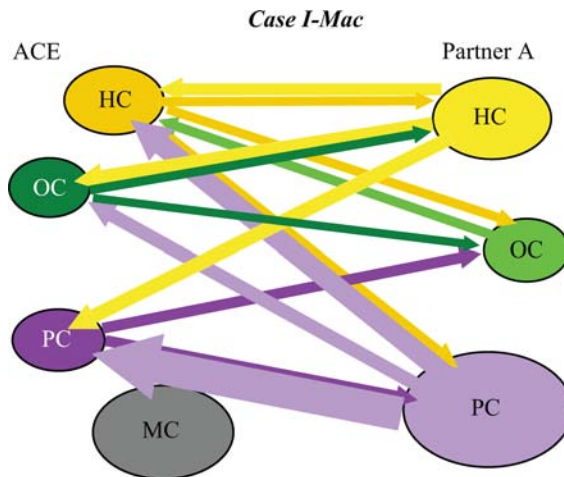
Table II.
Resource transformation matrix in Case I – value chain

From ACE	Case I – chain To Partner A					Sum(out) (%)
	HC (%)	OC (%)	RC (%)	PC (%)	MC (%)	
HC	6.9	6.9		9.2		23
OC	6.6	4.2		5.2		16
RC	2.7			0.3		3
PC	2.0	10.0		8.0		20
MC					38.0	38
Sum(in)	18.2	21.1		22.7	38.0	100

Table III.
Resource transformation matrix in Case I – value chain

From Partner A	Case I – chain To ACE					Sum(out) (%)
	HC (%)	OC (%)	RC (%)	PC (%)	MC (%)	
HC	9.0	10.5		10.5		30.0
OC	7.0	6.0		7.0		20.0
RC						
PC	15.0	10.0		25.0		50.0
MC						
Sum(in)	31	26.5		42.5		100

Figure 2.
The resource transformation between partners in Case I



given resource portfolio to address completely new problems, meaning that the resources form the basis for a competitive advantage of economies of scope. Therefore, monetary or physical resources can never be the basis for a competitive advantage. This study investigated Case II as an example of value shop logic.

Case II refers to an inter-firm partnership between the focal company and an engineering consulting company (Partner B). In the construction industry the engineering consultant company technically starts the design work based on the clients' (users) demands and requests, and then the construction company follows up with the construction design and purchases needed materials. Before 2000, the reinforced construction application had not been adopted popularly in Taiwan. In such a geo-technical engineering industry, material suppliers play a fundamental role of promoting the application for this ecosystem construction method. The material suppliers also integrate textile weave technology into civil engineering, which has become a competitive advantage in the construction and geo-technical engineering industry. Since 2002, ACE had organized a professional construction team with the intention to create and stimulate new market demands. In 2004, Partner B was invited by ACE to be an external consultant. The purposes of this inter-firm cooperation are:

- As a mentor and a well-known expert, Partner B instructs ACE to deal with complicated and difficult construction projects.
- By linking with Partner B's industrial relational connections, ACE is able to promote the geo-technical materials and to increase its reputation in the construction industry.

Contributed resources and transformation in the partnership. In this partnership, ACE contributed more HC (30 percent), PC (25 percent) and MC (20 percent) and Partner B contributed more OC (35 percent), HC (30 percent), and RC (25 percent). On the ACE side, the professional engineers and customer service staff were assigned to learn knowledge from the partner consulting company. ACE also input its facilities to work together with partner B for more kinds of geo-grid material research and development. On the partner side, Partner B dedicated its know-how of design methods, experience and capability in promoting the geo-grid materials, and knowledge of new material application. Partner B also contributed its RC such as connections with other consultant firms and academic institutions. Figure 3 shows the resources and relative importance contributed to the partnership in Case II.

How did the resources transform between ACE and Partner B? Tables IV and V demonstrate the transformation matrices from ACE to Partner B as well as from Partner B to ACE. Figure 4 shows the ICN in accordance with the results in Tables IV and V. As shown in Figure 4, the HC, OC, and RC contributed by Partner B transformed into ACE's HC, which strengthens the engineers' capabilities. Figure 4 also shows that Partner B's HC transformed into ACE's OC. Benefiting from the senior consultant's mentoring and instruction (HC) from Partner B, ACE has elevated its experience in design and practical construction (OC). On the partner side, the PC, HC, and OC contributed from ACE transformed into Partner B's OC. Benefiting from ACE who contributed its testing laboratory facilities (PC), engineers (HC), and production experiences (OC), Partner B is able to enhance its OC in design and application.

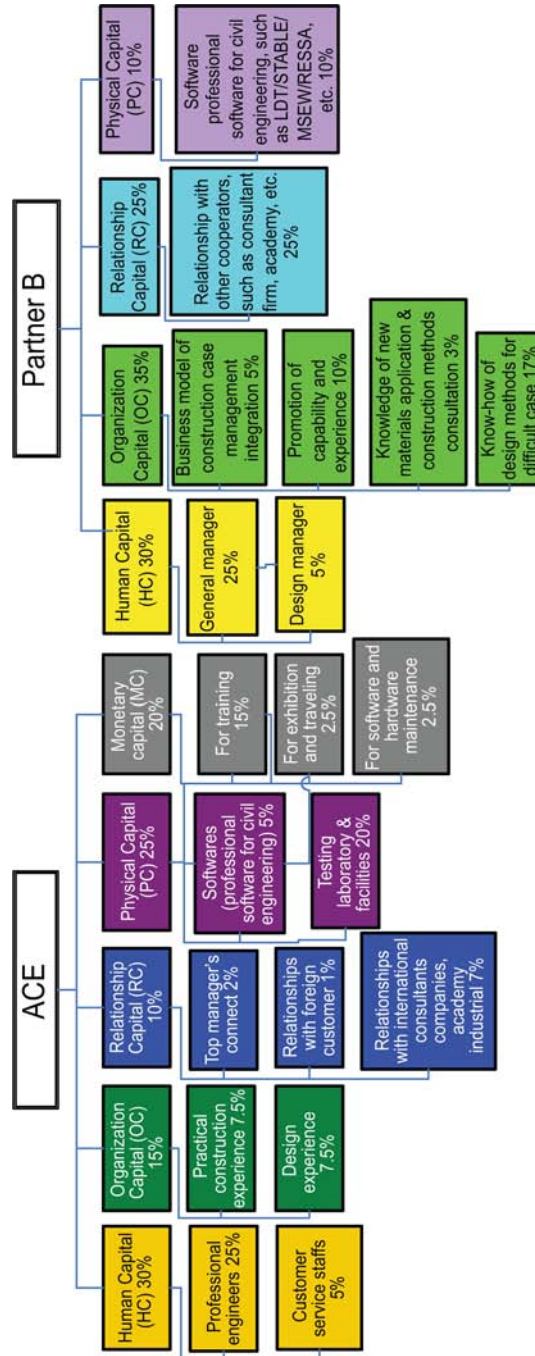


Figure 3.
The resources contributed to the partnership in Case II

Value network: Case III

Inter-firm partnership with value network logic. The type of value network logic relies on connecting people or organizations. This type of value creation relies on balancing network economic resources. The resources that form the basis for competitive advantage must show network economic behavior, meaning that the organizational and relational resources are the base of competitive advantage. This study investigated Case III as an example of value network logic.

		Case II – shop To Partner B					
From ACE	HC (%)	OC (%)	RC (%)	PC (%)	MC (%)	Sum(out) (%)	
HC	5.5	19.5	5.0			30	
OC	5.63	7.88	1.5			15	
RC	5.20	3.55	1.25			10	
PC	5.0	15.25	3.0	1.75		25	
MC					20.0	20	
Sum(in)	21.33	16.18	10.75	1.75	20.0	100	

Table IV.
Resource transformation
matrix in Case II –
value shop

		Case II – shop To ACE					
From Partner B	HC (%)	OC (%)	RC (%)	PC (%)	MC (%)	Sum(out) (%)	
HC	15.5	10.75	2.5	1.25		30	
OC	24.0	10.5		0.5		35	
RC	10.0	15.0				25	
PC	7.5	2.5				10	
MC							
Sum(in)	57.0	38.75	2.5	1.75		100	

Table V.
Resource transformation
matrix in Case II –
value shop

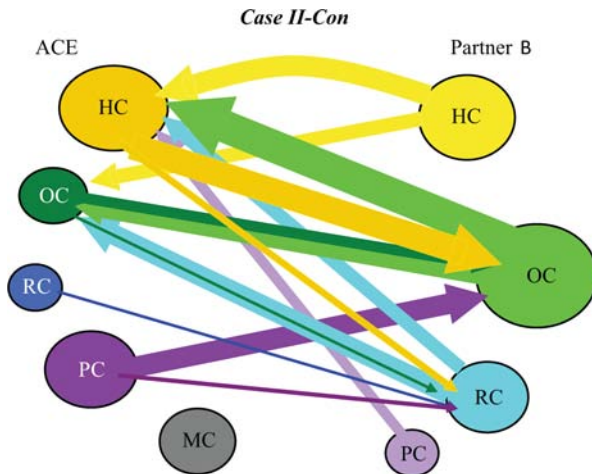


Figure 4.
The resource
transformation between
partners in Case II

Case III refers to an inter-firm partnership between ACE and a labor agent company (Partner C). Due to the complex and tedious procedures of importing laborers from less-developing countries, Taiwanese companies have encountered difficulties of dealing with governmental regulations to recruit foreign laborers. Therefore, the labor agents have become the bridge for connecting foreign laborers (supply side) and employers (demand side). The Partner C was established in 1992 and has been one of few leading agents who serve as a foreign labor broker. In order to enlarge its network economic resources and refine its professional services, Partner C has standardized the labor importation procedures. Having the professional services offered by Partner C, ACE is able to reduce the labor costs and to recruit foreign laborers more efficiently.

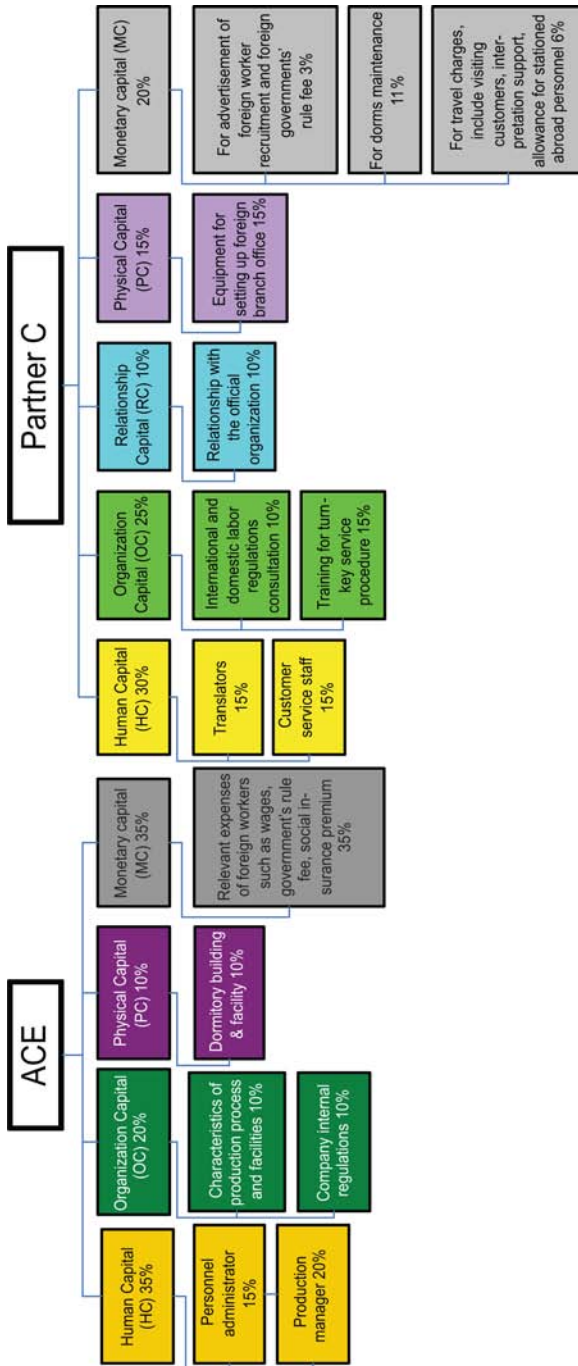
Contributed resources and transformation in the partnership. Figure 5 shows the resources and relative importance contributed to the partnership in Case III. On the focal company side, ACE contributed more MC (35 percent) and HC (35 percent). An amount of money was paid to Partner C for expenses on foreign labor recruitment. In addition, ACE's personnel administrator and production managers are responsible for training and managing foreign workers. On the partner side, Partner C contributed more HC (30 percent) and OC (25 percent). OC includes foreign labor training and regulatory consultation. Partner C dedicated its customer service and translation staff to the process of recruitment and training. Partner C also contributed its RC with governmental institutions.

Tables VI and VII indicate the transformation matrices from ACE to Partner C as well as from Partner C to ACE. In this partnership, ACE transferred its MC to Partner C. ACE transformed its HC into Partner C's organizational and human resources. Benefiting from ACE's OC, Partner C is able to enhance its organizational capability of customer services. On the other side, benefiting from Partner C's OC for labor recruitment consultation, HC for input translators and customer service staff, and RC of connection with government, ACE is able to fulfill the need of foreign labor recruitment. Figure 6 shows the resource transformation in this partnership.

Discussion

Overall, Table VIII summarizes the contributed, needed and transformed-in resources for both sides in the three cases, revealing how the resource fit between partners match with different types of value creating logic. As can be seen, Case I focuses on the efficiency of automation production facilities, representing the type of value chain logic. In this partnership, ACE needed more physical, human and OC and did transform-in PC (42.5 percent), HC (31 percent), and OC (26.5 percent) from Partner A. Partner A needed more monetary, physical, and OC and did get MC (38 percent), PC (22.7 percent), and OC (21 percent) from the focal company. The resource contribution and transformation in Case I show that PC, MC, and OC form the basis of competitive advantage in the partnership with value chain logic.

In Case II, the cooperation relies on the value of solving problems and providing solutions in the construction material application, representing the type of value shop logic. In this partnership, ACE needed more organizational and HC and did acquire OC (57 percent) and HC (38.75 percent) from partner B. On the other side, Partner B acquired OC (46.18 percent), HC (21.33 percent), and RC (20 percent) from the focal company, just as the resources that Partner B needed. The resource contribution and



Resource fit in inter-firm partnership

Figure 5. The resources contributed to the partnership in Case III

transformation in Case II show that HC and OC form the basis of competitive advantage in the partnership with value shop logic.

Case III referred to a partnership between ACE and a labor agent company, representing the type of value network logic. In this partnership, ACE needed more HC and did benefit from the recruitment of foreign laborers in HC (72.75 percent) by

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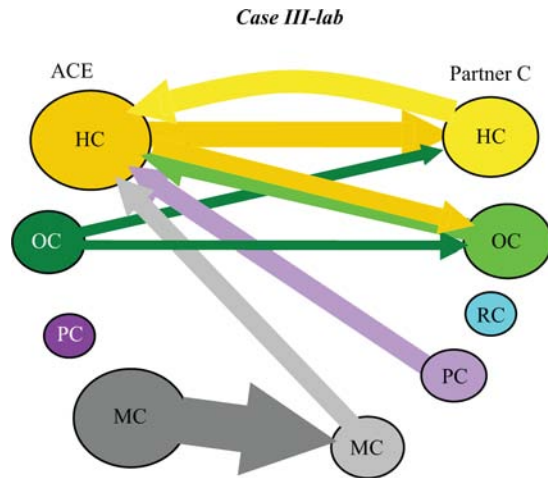
Table VI.
Resource transformation matrix in Case III – value network

From ACE	Case III To Partner C					Sum(out) (%)
	HC (%)	OC (%)	RC (%)	PC (%)	MC (%)	
HC	18.5	13.0	3.5			35
OC	8.0	7.0	2.0	3.0		20
RC						
PC	6.0	4.0				10
MC					35	35
Sum(in)	32.5	24.0	5.5	3.0	35	100

Table VII.
Resource transformation matrix in Case III – value network

From Partner C	Case III To ACE					Sum(out) (%)
	HC (%)	OC (%)	RC (%)	PC (%)	MC (%)	
HC	17.25	8.25		3.0	1.5	30
OC	16.5	3.5		2.5	2.5	25
RC	10.0					10
PC	15.0					15
MC	14.0				6.0	20
Sum(in)	72.75	11.75		5.5	10	100

Figure 6.
The resource transformation between partners in Case III



Resource contributed			Resource transform-in					
Resource	(%)	Resource needed	HC (%)	OC (%)	RC (%)	PC (%)	MC (%)	
<i>Case I – value chain</i>								
ACE		PC, HC, OC	31.00	26.50		42.50		
HC	23							
OC	16							
RC	3							
PC	20							
MC	38							
Partner A		MC, PC, OC	18.20	21.10		22.70	38.00	
HC	30							
OC	20							
PC	50							
<i>Case II – value shop</i>								
ACE		HC, OC	57.00	38.75	2.50	1.75		
HC	30							
OC	15							
RC	10							
PC	25							
MC	20							
Partner B		OC, HC, RC	21.33	46.18	10.75	1.75	20.00	
HC	30							
OC	35							
RC	25							
PC	10							
<i>Case III – value network</i>								
ACE		HC	72.75	11.75		5.50	10.00	
HC	35							
OC	20							
PC	10							
MC	35							
Partner C		MC, OC, HC	32.50	24.00	5.50	3.00	35.00	
HC	30							
OC	25							
RC	10							
PC	15							
MC	20							

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Table VIII.
The results of resource fit
in different types of
value logic

collaborating with Partner C. On the partner side, Partner C needed monetary, human, and organizational resources and did benefit from ACE's MC (35 percent), HC (32.5 percent), and OC (24 percent). The results of resource contribution and transformation between the two sides in each of these three cases indicate the resource fit in the inter-firm partnerships.

The results of resource transformation raise an important question as to the distinction between resource transformation and resource transfer. The resource transfer refers to "like-to-like" resources converting between two partners such as HC-to-HC; whereas the resource transformation indicates the "like-to-unlike" resources conversion, such as HC-to-OC.

As in Tables II and III, we observed that in the value chain logic, IC transfer (including HC-to-HC, OC-to-OC, PC-to-PC, MC-to-MC) is 57.1 percent and IC transformation is 42.9 percent from ACE to Partner A; whereas IC transfer is 40 percent and IC transformation is 60 percent from Partner A to ACE. This implies that when the major driver of cost is scale and capacity utilization in the value chain logic, relatively larger portion of IC transfer is needed to create value, particularly the resource transfer of physical and MC, because the “like-to-like” resources converting between partners enlarges the use of homogeneous resources, therefore, increasing the economy of scale and capacity utilization.

In contrast, with the value shop logic in Case II, Tables IV and V show that IC transfer is 36.38 percent but IC transformation is 63.62 percent from ACE to Partner B; whereas IC transfer is 26 percent and IC transformation is 74 percent from Partner B to ACE. The results demonstrate that when information asymmetry exists in the value shop model, relatively larger portion of IC transformation is needed to solve customer’s problem, therefore, the IC transformation such as OC-to-HC, RC-to-HC, RC-to-OC enhances firm’s capability of problem solving.

In the case of value network model, Tables VI and VII shows that IC transfer is 60.5 percent but IC transformation is 39.5 percent from ACE to Partner C; whereas IC transfer is 26.75 percent and IC transformation is 73.25 percent from Partner C to ACE. To take a closer look at this case, ACE transferred its MC to Partner C (38 percent) in order to exchange for HC, therefore, Partner C transformed its resources (OC, RC, PC and MC) into ACE’s HC (72.5 percent). The resource exchange between two sides is based on the contractual relationship where partner was being paid on a service contract to build human competence for the focal company. This indicates that in the value network logic, Partner C is able to increase its service capacity by offering mediating technology, and ACE is able to gain the needed resources from partner’s network.

Whether or not transformation of like-to-unlike resources shows value creation capacity more than straightforward transfer of like-to-like resources? The findings of this study imply that the portion between transformation and transfer may vary with types of different value-creating logic. In the inter-firm partnership, what resource is needed and what resource is contributed from each side can also influence the decision of transfer opposed to transformation when managers are about to invest IC resources for alliance building.

Another critical issue is raised. In the inter-firm partnership, how to evaluate the IC investment in terms of return on investment? For example from the focal company’s aspect, we calculated the ratio of transform-in (gained from partner) to transform-out (contributed to partner) for each IC component, which is similar to the concept of return on investment at the firm level. The results indicate that the ACE’s in/out ratio of HC is 1.03, OC is 1.77, and PC is 1.7 in value chain model; ACE’s in/out ratio of HC is 1.9, OC is 2.53 in the value shop model; whereas ACE’s in/out ratio of HC is 2.08, OC is 0.59 in the value network model. The findings imply that from the focal company side, the investments of OC and PC in the value chain model, HC and OC in the value shop model, and HC in the value network model are worthwhile, since the in/out ratio is larger than 1, meaning that for those IC components, the focal company gained much more from its partners than invested in the partnership.

Conclusion

Inter-firm partnership is considered the source of competitive advantage. Resource fit between partners is the key for successful inter-organizational cooperation, particularly the fit of IC. Roos *et al.* (2005) propose the ICN to analyze the resource transformation within the organizational cooperation. This study contributes to extend the use of the IC approach for analyzing the resource fit in the inter-firm context. The cooperation between two firms is to create collective value logic. This study investigated three cases representing three types of value creation logic – value chain, value shop, and value network – demonstrating how the resource contribution and transformation reveal resource fit between partners with different value creating logics. The results of this study demonstrate that:

- (1) Given *value chain* logic, while the inter-firm partnership emphasizes on standardization, efficiency and economy of scale, resource fit between partners in traditional resources of physical and MC, and IC of OC can form the basis of value creation.
- (2) Given *value shop* logic, while the inter-firm partnership emphasizes on problem solution and economy of scope, resource fit between partners in IC of human and OC can form the basis of value creation.
- (3) Given *value network* logic, while the inter-firm partnership emphasizes on network economic behavior, resource fit between partners in IC of human, organizational, and RC can form the basis of value creation.

Except for the above-mentioned findings, this study also found an interesting issue as to the distinction from resource transfer to resource transformation. Previous literature pertaining to knowledge transfer has not been clarifying whether IC resource straightforwardly transfer from one partner to the other opposed to IC resource transformed from one side into another type of resource in the other side. This study examines how resources were transferred and/or transformed between two partners. The results imply that the portion between transformation of “like-to-unlike” and transfer of “like-to-like” may vary with types of different value-creating logic in the inter-firm partnership. For example, we found IC transfer makes the larger portion of value conversion than IC transformation in the value chain model but IC transformation constitutes the larger portion of value conversion than IC transfer in the value shop model.

However, the results did not answer the question as to what are the performance of resource transformation and transfer in the inter-firm partnership. How the IC investment (contributed resources) and benefit (gained resources) affect the financial performance and operational performance for each company in the inter-firm alliance. For example, when assessing IC investments in terms of ROI, some approaches such as EVATM (Stewart, 1997) can be used for IC evaluation at the firm level. In the inter-firm partnership, despite we calculated the ratio of transform-in (gained from partner) to transform-out (contributed to partner) to realize the return on investment of each IC component, more performance measurements related to assessing IC investment at the inter-firm level is needed in the future research.

This study is exploratory. Of course, our sample was limited to three inter-firm partnership cases representing three different types of value configuration, thereby, raising for questions of generalizability. However, the intention of this study is not to

propose generalized findings but to demonstrate an alternative way for managers investing IC resources in the inter-firm partnerships. This is particularly critical when previous studies on strategic alliance and network have paid less attention to resource fit based on IC perspective.

Theoretically, this study contributes to be a starting point for analyzing the resource input and transformation in the inter-organizational context by using the IC approach. Practically, this study contributes to more practical references as to reveal given different types of value creating logic, how two partnering companies can manage and deploy their IC and traditional resources in order to fit in the inter-firm cooperation.

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