Social and Cognitive Mechanisms for Knowledge Sharing in Interorganizational Network

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Abstract
This study explores the mechanisms in interorganizational network that facilitate knowledge sharing among network members. Based on the knowledge-based view of organization and embeddedness theory, I propose a framework to describe how social and cognitive mechanisms affect knowledge sharing in interorganizational network. It is argued that social and cognitive mechanisms contribute to knowledge-sharing because the mechanisms enhance connectedness, the willingness to share, and the ability of absorbing knowledge among network members. Connectedness contributes to knowledge sharing among network members while the willingness-to-share and the ability of absorbing manipulate the effects of the connectedness.

Key words: interorganizational network; knowledge sharing; knowledge-based view; social mechanisms; cognitive mechanism

Introduction
Interorganizational network provide firms with access to various kind of resources, such as knowledge (Gulati, 1999). Interorganizational network provide knowledge with network ties which can be opened channels and closed conduits to spill knowledge and information into firms within interorganizational networks (Owen-Smith & Powell, 2004). Network ties represent interactions between/among network members, these interactions including exchange information, resource, and/or knowledge. Through interorganizational ties, firms can have opportunity to access to knowledge outside their boundary. Interorganizational network thus create the possibility for innovation by bringing together different ideas and information and thus can be potential knowledge source for firms (Power and Brantley, 1992).

However, the accesses of knowledge in interorganizational network are not always ensured, since there are barriers to firms that share each others’ knowledge (Dyer & Nobeoka, 2000). For example, if network members do not directly link to each others, there are bottle necks of knowledge flow and knowledge, especially for tacit knowledge, can not be shared among them. Besides, if members will not share their knowledge or do not have ability to absorb knowledge in their network, it is unlikely that they will exchange and access each others knowledge (Cohen & Levinthal, 1990; Dyer & Nobeoka, 2000; Lane & Lubatkin, 1998). For example, Dyer & Nobeoka (2000) find that Toyota creates and manages a knowledge-sharing network among its supplier by motivating members to share knowledge, preventing free riders, reducing knowledge-searching costs. Dhanaraj & Parkhe (2006) argue that in certain innovation network members are not obliged to obey hub firms’ command, hub firms have to be an “orchestrator” to manage knowledge mobility, innovation appropriability and network stability to improve network innovation outcome. Lane and Lubatkin (1998) demonstrate that the ability to absorb partners’ knowledge is important to interorganizational learning. These literatures point out the important of the conduits to access, willingness to share and ability to absorb for interorganizational knowledge-sharing.

This paper explores the mechanisms that enhance knowledge-sharing in interorganization: Social and cognitive mechanisms in interorganizational networks. According to knowledge-based view of organization (Grant, 1996; Kagut, 2000; Kagut & Zander, 1992) and embeddedness theory (Granovetter, 1985; Uzzi, 1997; 2003), I argue that
knowledge sharing in interorganizational network can be understood through analyzing how social and cognitive mechanisms operate. Specifically, social mechanisms contribute to the connectedness of network members and the willingness of network members to share knowledge. Cognitive mechanism contributes to the effectiveness of knowledge-sharing activities.

This study is organized as follows: Firstly, I discuss three factors that eliminate the barriers to interorganizational knowledge sharing. Then, social and cognitive mechanisms based on knowledge-base view are applied. Thirdly, we propose the framework to describe how social and cognitive mechanism influence interorganizational knowledge.

Factors Eliminating the Barriers of Interorganizational Knowledge-Sharing

According to Appleyard (1996), interorganizational knowledge-sharing is the transfer of knowledge and information across firm boundary. While considering knowledge and information transfer across firm boundary, there are barriers to effective transfer: The lack of conduits, afraid of unwanted spillover, and unable to absorb (Dyer and Nobeoka, 2000; Wathne, Roos, and Krogh, 1996). These three barriers can be eliminated by three factors that facilitate interorganizational knowledge-sharing: The connectedness of each others, willingness to share knowledge, ability of absorbing knowledge.

Connectedness of members

Connectedness is defined as network’s “structural ability to facilitate noise free communication between its components” (Castells, 1996: 171). Connectedness implies communication and coordination within network. Because knowledge can be explicit or tacit (Polanyi, 1967), communication and coordination take variety of forms. Explicit knowledge can be easily codified and processed by impersonal mechanism such as rules, directives, and sequencing. Tacit knowledge, on the other hand, can not be easily codified and has to be processed by personal mechanism such as routines, group problem solving and decision making (Grant, 1996). Thus, in an interorganizational network, there should be both personal and impersonal mechanisms to ensure members have the connectedness to access explicit and tacit knowledge to perform tasks, solve problems or improve innovation.

Connectedness is one important antecedent for knowledge sharing in interorganizational network. Connectedness of members to access knowledge in interorganizational network can be conceptualized as two forms: “open channels” or “closed conduits” link to information and knowledge providers (Owen-Smith, 2004). “Open channels” are weak connections among actors in a network and provide information and knowledge to both loosely connected and centrally positioned organizations. “Closed conduits”, on the other hand, are designed to ensure that only specific members can access information and knowledge in the interorganizational network.

Literatures of knowledge-sharing in interorganizational network recognize the important to enhance Connectedness of members. For example, Dyer and Nobeoka (2000) found that Toyota developed a dense structure of supplier network that facilitated interaction and knowledge-sharing among suppliers. In order to transfer both explicit and tacit knowledge among suppliers, Toyota developed its strong ties with suppliers, strong ties among suppliers, and multilateral and bilateral knowledge-sharing process. Those efforts increased suppliers’ connectedness to access knowledge with each other. Dyer and Hatch (2006) also found that days of face-to-face contact was positively associated with suppliers’ performance in the knowledge arena targeted.

The literatures of knowledge spillover in interorganizational network also demonstrate the effect of connectedness. For example, the research of Owen-Smith and Powell (2004) revealed the effect of opportunity to access knowledge in interorganizational network. They found that in an open interorganizational network, centrality is positively associated with innovation performance through the effect of knowledge spillover. However, in a close interorganization network, membership was positively associated with innovation performance through the effect of access to information transmitted through informal network channels. These conclusions imply that firms’ connectedness to access knowledge from each others is important to keep knowledge flowing in interorganizational network.
Proposition 1: In interorganizational network, connectedness of members is positively associated with interorganizational knowledge-sharing.

Willingness to share knowledge

The literatures regarding interorganizational knowledge sharing emphasize the important of firm’s willingness to share out their knowledge (Dhanaraj and Parkhe, 2006; Dyer and Nobeoka, 2000). Because it is a nature tendency for firms to protect their valuable know-how (Nooteboom, 2001), firms have to be motivated to participate in knowledge sharing activity and openly share out their knowledge (Dyer and Nobeoka, 2000). Dyer and Nobeoka (2000) suggested that knowledge sharing in a network setting faced some dilemmas; the first two dilemmas had to do with the willingness to share knowledge. First, individual firms tend to protect valuable knowledge to prevent disadvantage of knowledge spillovers. Second, shared knowledge in interorganizational network become public good and thus suffer free-rider problem. Free riders enjoy the benefit of knowledge from others while unwilling to share out their knowledge. Dhanaraj and Parkhe(2006) suggested that managing innovation appropriability will positively associate with knowledge mobility, network stability and network innovation outcome. The process of managing innovation appropriability includes managing trust, procedure justice and joint asset ownership. These three processes exert their influence by affecting firms’ willingness to contribute their knowledge.

We propose that a key factor for two or more connected firms to exchange information or knowledge is their willing to share knowledge. Appleyard (1996) pointed out that while firm expected that the opportunity cost of knowledge sharing exceeds benefit, firm tent to keep their valuable knowledge in house. Therefore, while firms perceive knowledge transferee would use the transferred knowledge against them, they tent to act protectively to prevent “competitive backlash” (Appleyard, 1996). Such protective behavior would act against the effectiveness of knowledge sharing because it may decreases the richness of interaction and trust and thus decrease the degree of openness of the connected parties (Wathne, Roos, and Krogh, 1996). In such a circumstance, firms are unwilling to share out their knowledge and knowledge-sharing can not be achieved. Aadne, von Krogh, Roos (1996) indicate that openness, the willingness to share knowledge and density of interact, is one of major factors affection interorganizational knowledge-transfer. Therefore, while firms’ willingness to share knowledge is high, connectedness will fruitful in regarding of knowledge sharing. On the other hand, while firms’ willingness to share knowledge is low, connectedness will has less effect on knowledge-sharing among network members.

Proposition 2: In interorganizational network, the more the members’ willingness to share knowledge, the more the positive effect of connectedness will be on interorganizational knowledge-sharing.

Ability of Absorbing knowledge

Knowledge-sharing depends not only on knowledge transferors, but also on knowledge transferees. While willingness is important for transfers to share out their knowledge, the ability of absorbing knowledge from transfers is crucial for transferees. Aadne, Krogh, and Roos (1996) indicated that whether knowledge transferee can accept and dissimilate transferred knowledge would affect the effectiveness of knowledge transfer. Cohen and Levinthal (1990) highlighted the role of ‘absorptive capacity’ for a firm to exploit external knowledge. They defined ‘absorptive capacity’ as a firm’s general ability to value, assimilate, and commercialize external knowledge. They found that firms’ ability to absorb outside knowledge is important for innovation performance.

Based on the insight of Cohen and Levinthal (1990), Lane and Lubatkin (1998) proposed ‘relative absorptive capacity’ was important for interorganizational learning. Relative absorptive capacity is defined as ‘a student firm’s absorptive capacity, its ability of valuing, assimilating, and applying new knowledge from a learning alliance partner’ (Lane and Lubatkin, 1998: 462). They proposed that interactive learning between two firms permitted a firm to add value to its capability. However, if student firms lack of ‘relative absorptive capacity’, they can not understanding and commercializing new knowledge from teacher firms.
I propose that the ability of network members to absorb knowledge affects connected members to share information or knowledge with each other. Mowery, Oxley, and Silverman (1996) suggested that firms’ absorptive capacity for learning from its alliance partner explained the extent of technological capability transfer. This insight helps explain the efficiency of tacit knowledge sharing among firms. Dyer and Nobeoka (2000) suggested that one dilemma of knowledge sharing in interorganizational network was the efficiency of knowledge transfer among a large group of members. This dilemma has to do with explicit/tacit dimension of knowledge. Explicit knowledge can be easily codified and transfer among network members. Tacit knowledge, however, is not easy to codify and requires intense interaction and ability to absorb. Firms, therefore, possessing absorptive capacity for learning from their alliance should learn faster than those who have not.

**Proposition 3:** In interorganizational network, the more absorptive capacity the firms possess, the more the positive effect of connectedness of interorganizational knowledge-sharing will be.

### Social and Cognitive mechanisms in Knowledge-based View

Scholars of knowledge-based view recognize the role of cognitive and social mechanisms in organization for the knowledge combination. According to Grant (1996), organizations are institutions for integrating knowledge. The key for organizations to integrating is that they are social communities specializing in efficient knowledge creation and transfer (Kogut & Zander, 1996; Brown & Duguid, 2001). Social communities compose of informal interpersonal networks that enable social control mechanisms such as reciprocity, reputation concern and identification get into play. Social communities also compose of cognitive mechanisms for members to share knowledge with and absorb knowledge from each other. For example, knowledge embedded in the ‘higher-order organization principles’ guide the members of organization to coordinate groups and transfer knowledge (Kogut & Zander, 1992). Kogut and Zander (1992) argues that shared language or code are required to transfer knowledge within group and cited Arrow (1974) that organization had the ability to economize in communication through common language or code.

In spite of the differences between interorganizational network and authorities of firm, they share some common characters. For example, there are social mechanisms to coordination action within firms and interorganizational network (Brown and Duguid, 2001; John, Hesterly and Borgatti, 1997). Thus, the logic of knowledge-based view of the firm can be selectively extended to interorganizational level. Some literatures about interorganizational network offer such cases. For example, Kogut (2000) suggested that the formation and coordination of interorganizational network was guided by ‘enduring principles of organization’. Manuel and Randi (2004) suggested that the boundary of a governed interorganizational network was determined by identification shared by network members.

Based on the insight of knowledge-base view, I propose a framework of how social and cognitive mechanisms affect interorganizational knowledge sharing (Figure 1). In this framework, social mechanisms including embeddedness and network identity have positive effects on members’ willingness to share and Connectedness of members (P4-P6). Network memory that represent cognitive mechanism positive affects members’ ability to absorb knowledge from each others (P7). Connectedness is positively associated with knowledge sharing among network members (P1). However, the effect of connectedness on knowledge sharing is moderated by members’ will to share and ability to absorb (P2 and P3).
Social mechanisms in interorganizational network

Social mechanisms are “social processes having designated consequences of designated parts of the social structure” (Merton 1968:43). While social mechanisms are unobservable, they provide explanations for observed relationships between causes and effects. That is, social mechanisms provide meaningful connection between events and an account of what happened as it actually happened (Elster, 1989; Hedström and Swedberg, 1996). Thus, identifying social mechanisms in an observed relationship between two constructs “provide (or encourage) deeper, more direct, and more fine-grained explanations” than either black-block explanations or general laws in social sciences (Hedström and Swedberg, 1996; p.287).

Hedström and Swedberg (1996) proposed that mechanism-based explanation was characterized by three principles: direct causality, limited scope, and methodological individualism. The first principle denotes the efforts to open the black-box and bridge the gap between cause and effect. The second principle captures the idea that sociology should aim at explanations for a limited range of phenomena instead of prematurely trying to establish universal social laws. The third principle captures the idea that in the social sciences, actors and not variables do the acting. Therefore, in addition to the explanation phase (why and how), social mechanisms include conditional and action phase that tell when, where, and who do the actions.

Drawing Granovetter’s(1985) and Williamson’s(1985, 1991) opinions, Jones, Hesterly, and Borgatti (1997) argued that interorganizational network was governed by social mechanisms to resolve exchange problems face by network members. Thus, social mechanisms play an important role in network mode of governance. In the model proposed by Jones, Hesterly, and Borgatti (1997), social mechanisms such as restricted access, macroculture, collective sanctions, and reputation helped resolve coordination and safeguarding problems of exchange. They proposed the notion of network governance which employs “social mechanisms as solutions to exchange problems” (p.925). Transaction cost economic asserted that the network form of governance was a response to exchange conditions of asset specificity, demand uncertainty, task complexity and transaction frequency. These exchange conditions drive firms toward middle or long terms relationship with exchange partners, and such relationships were typified by reciprocal patterns of communication and exchange (Powell, 1990). These patterns indicate that firms use social mechanisms for coordinating and safeguarding exchanges under the network governance.
Powell (1990) suggested that norm of reciprocity under reputation concern was the major method of conflict resolution in network organization. Kogut (2000) found that rules, which rewards for cooperation and sanctions for defection, tent to dominate in the interorganizational network.

Because social mechanisms provide communication and coordination in interorganizational network, I propose that two social mechanisms provide similar functions for knowledge sharing, that is, embeddedness and network identity.

Network Embeddedness

Network embeddedness addresses the degree of members participating in interorganizational network (Uzzi, 1996). Firms participate in interorganizational network bring them benefit of timely access of information and referral to other members in the network (Burt, 1992).

Embeddedness contributes to firms’ willingness to share out knowledge by enhancing mutual trust and solving value appropriation problem. First, Gulati (1998) suggested that a social network of prior ties serve as effective referral networks and enhance knowledge-based trust and deterrence-based trust among embedded firms. Using prior social structure as effective referral network, firms generate knowledge-based trust with each other based on mutual awareness and equity norms. Knowledge-based trust has strong cognitive and emotional bases and is usually associated with personal relationship. Macaulay (1963) observed that personal relationship ‘exert pressure for conformity to expectation’ (63). With knowledge-based trust, personal connections across organizations can serve as information and knowledge exchange conducts without concerning free-riding problems.

Deterrence-based trust

Secondly, one of the important embeddedness functions solve the problem of value appropriation by change of the relations from pure market transaction to a trust- and reciprocity-base exchange. Pure market transaction is characteristic with arm-length tie and suffers from opportunism. The problem of opportunism is essentially a value-appropriation problem because opportunism parties seek self-interest with guilt and thus gain unfairly more shares on transactions (Rindfleisch and Heide, 1997; Williamson, 1985). According to transaction cost theory, opportunism increases transaction cost and need to be redress through appropriate governance device such as incentives alignment or third parties enforce fairness (Williamson, 1985; Rowley et al., 2000). Embedded ties, however, provide context for social mechanisms to be develop to solve value-appropriation problems. Embeddedness happens in the context of repeating or long-term exchange situations. Through repeating or long-term transaction process, the nature of relation between exchange actors transform from pure market transaction to an embedded tie. According to embeddedness theory (Granovetter, 1985; Uzzi, 1997, 1999; Uzzi and Gillespie, 2002), embedding process provide actors the chances to develop reciprocity and trust to managing transactions. Thus, the distributive bargaining logic by which market transaction take place is changed because embeddedness serves as social mechanisms to manage value appropriation among transaction parties (Ring and Van de Ven, 1993; Gulati, 1995; Dyer and Singh, 1997).

In a network setting, free-rider problem will be reduced and willingness to share knowledge will be increased if trust is enhanced and appropriation concern is mitigated. Dhanaraj and Parkhe (2006) proposed that in an atmosphere of trust, openness and commitment, appropriability concerns are low, and learning flourishes because firms are more willing to share their proprietary knowledge’ (p. 664). Uzzi (1997, p.42) suggested that “embedded relationships have three main components that regulate the expectations and behaviors of exchange partners: trust, fine-grained information transfer, and joint problem-solving arrangements.” Uzzi (2003) found that interfirm learning is located not only in past experience but also in relationship among firms. These insights stress the fact that embeddedness enhances knowledge sharing in interorganizational network through participants’ willingness to share.

P4: In interorganizational network, network embeddedness enhances firms’ willingness to share knowledge.

Embeddedness also provides firms connectedness and interaction with each others. As
recognized by social network theorist (Gulati and Gargiulo, 1999; Granovetter, 1985; Uzzi, 1997, 1999), firm embedded in interorganizational network bring them information benefit. For example, Uzzi and Gillespie (2002) found that network embeddedness may provide ‘governance and access benefits’ (p.598). They found that corporate financing network provide firm access to informational and capital resource through special governance arrange. Gulati and Gargiulo (1990) proposed embeddedness provides timely, relevant information about potential partners. Gulati (1998) suggested that networks might provide information benefit through relational embeddedness and structural embeddedness. Relational embeddedness highlights the role of direct tie as a mechanism to access fine-grained information. Structural embeddedness means that network structural and actors' position in a network shape the web of actors’ information sources. These two kind of embeddedness share

P5: In interorganizational network, network embeddedness increases the connectedness of members.

Network identity

Knowledge-based-view of the firm recognizes identity as an important governance mechanism in organization. Organization such as firm provides social community in which identification is achieved by socialization. Through socialization, organizational members develop a collective sense of what “we” are, that is, organizational identity. Kogut and Zander (1996) argued that organizational identity solved coordination problems by promoting joint learning and communication. Their argument is base on the idea that identity can be a behavioral foundation. This behavioral foundation derives form social aspect of human being in the context of division of labor, such as the need of moral order and affective attachment (Durkheim, 1983). However, in interorganizational network setting, do moral order and affective attachment be needed by network members? That is, dose interorganizational network generate network identity?

Some network literatures suggest that network identity can be achieved beyond firm level identity (Dyer & Nobeoka; Kogut 2000; Manuel and Randi 2004). For example, Kogut (2000) conclude that “A network is then a collection of firms, each ensconced in an identity that supports specialization and a dynamic of learning and exploration” (p.409). Knowledge-based-view of the firms recognized that identity as the cognitive representation which constitutes the object of membership and thus the perceived boundary of the firm (Kogut and Zander, 1996). Lars, Manuel and Randi (2004) proposed that network governed by a strong lead firm could, through a share sense of purpose, develop a clear sense of membership.

Hite and Hesterly (2001) provided an interest contrast between networks with and without identification. They suggested that interorganizational network can be divided into two different kinds: identity-based and calculation-based. They coined the term “identity-based networks” as those networks emphasize cohesion and are constituted by socially embedded ties. They argued that firms in their emerging state tend to form identity-based network. The reason is that emerging firms usually face high degree of uncertainty and possess low degree of legitimacy and reputation: they need to gain external resource but lack of necessary capital and legitimacy for exchanging in market. Socially embedded ties, such as relationship with close friends and family members, may provide new firms the opportunity to gain access needed resource or knowledge. While firms added new non-embedded ties, they develop calculation-based network which allow them to explore “structure-hole rent” that follow the logic of zero-sum game (Burt, 1992). Thus, in a calculation-based network, identity is weak and lack of collective good.

Identity provides not only sense of belonging and membership but also willingness to contribution for collective benefit. Dyer & Nobeoka (2000) found that network identity forms some kind of boundary that facilitates knowledge flow within network. This effect comes from the fact that members would like to make contribution within network instead of outside. Gnyawali & Madhavan (2001) suggested that identification defined the boundaries of governed network. In network with identification, members have a sense of belonging, acceptance, and goal congruence. Thus, goals are perceived to be compatible and members are willing to contribute their knowledge for collective goal. In a network without identification, however, self-interest of members outweighs the collective benefit.
Cognitive mechanisms in interorganizational network

While social mechanisms provide connection and motivation to network members, cognitive mechanisms provide capability to assimilate knowledge. We define cognitive mechanisms as the frame of reference or ‘mental structures to organize knowledge’ (Mintzberg, Ahlstrand, and Lampel, 1998, p.159). Cognitive school of strategic management use different terms to represent frame of reference, in which map is a popular one. Map implies that in confusing situation, actors are navigated through some kind of representative model. Knowledge, especially for those embedded in complex social relationship (Brown and Duguid, 2001), can only be shared within communities where members have the same map or common frame of reference.

In interorganizational network, common frame of reference is developed among members’ cooperation experiences and expertise in the same area. We define cognitive mechanisms in interorganizational network as frame of reference commonly held by network members or embedded in network relationships, providing shared representations, interpretations, and systems of meaning among parties. (Jaffee, 2001; Badaracco,1991; Cicourel,1973). We suggest that cognitive mechanisms provide network members the ability about how to share knowledge, knowing with whom to share knowledge and absorb knowledge from network members. We identify network memory as a major cognitive mechanism in interorganizational network that help members to absorb knowledge from each others.

Network memory

Network memory is defined as the amount of knowledge, experience, and the familiarity with the process of network. This definition is drawn from Hult, Ketchen and Slater (2004), they used the term “achieve memory” to present “the amount of knowledge, experience, and familiarity with the supply chain process”(p.243). Achieve network memory represent the network experience shared by network members. For example, Soda and Zaheer (2004) defined network memory as the memory of prior collaboration experience in interorganizational network that influence network performance.

Network memory is important for members to digest knowledge from other network members, especially for network embedded knowledge. Knowledge reside in interorganizational network can be migratory or embedded (Badaracco, 1991; Jaffee, 2002). Migratory knowledge can be easily transferred among firms because it can be access without necessarily creating an alliance network with other firms. Migratory knowledge “encapsulated in formulas, designs, manuals, or books, or in pieces of machinery… If an individual or an organization with the appropriate capabilities gets the formula, the book, the manual, or the machine, it can get the knowledge” (Badaracco, 1991: 9). In contrast to migratory knowledge, embedded knowledge is complicate and sticky because it resides in complex social relationships. If firms want to gain access to this knowledge, they must form multiple ties, typically product link and knowledge link, with other firms. That is because network embedded knowledge exists in process and routine among network members, through which they coordinate their activity and input and apply migratory knowledge to jointly create value (Kogut, 2000).

Through multiple ties, network members accumulate network memory including knowledge, experience, and familiarity with network process. There is literature recognized the components of memory have effect on knowledge-transfer across organizational boundary. For example, Hamel (1991) found that absence of prior experience is the highest barriers to accept knowledge. While knowledge is not accepted, it is impossible to be dissimilated. Network memory includes prior experience to provide needed knowledge and experience to absorb shared knowledge in interorganizational network.

P7: In interorganizational network, network memory enhances members’ ability of absorbing knowledge from each other.
Conclusions

Identifying barriers and mechanisms help us to understand whether knowledge can be shared in specific context. In interorganizational network, there are barriers to knowledge sharing among members. In order to explore how these barriers are conquered, we need to find out what mechanisms operating in interorganizational network that eliminate these barriers. Social mechanisms help conquer two kinds of barriers to knowledge sharing in interorganizational network: lacking conduits and protective metal. For example, embeddedness, one of social mechanisms, helps to connect network members that facilitate information and knowledge flow among them. Identity, the other social mechanism, and embeddedness influence the willingness of network members to contribute there knowledge. Cognitive mechanism, on the other hand, helps network members to conquer the barrier of knowledge stickiness. Network memory, the cognitive mechanism in interorganizational network, helps members to assimilate knowledge embedded in their network. Through social and cognitive mechanisms in interorganizational network, knowledge is shared among network members.

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