On the Role of Partners in a Multi-disciplinary Business Network: A Knowledge Management Perspective

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Abstract
Creating a successful offering in a knowledge-intensive industry often requires access to knowledge that complements the core technological knowledge of a firm. However, this complementary knowledge is often tacit and hence costly to acquire. In this paper, we investigate how a firm can acquire the necessary complementary knowledge by leveraging partners in its business network. Based on a multiple case study of four Finnish enterprise software firms, we find that engaging partners who possess both core and complementary knowledge improves the efficiency and effectiveness of knowledge transfer between the focal firm and its customers. In addition, using partners for this purpose allows the focal firm to concentrate on developing its core competences, which ultimately is the source of competitive advantage and superior market and financial performance. Our findings constitute a step towards moving from dyadic to networked knowledge acquisition models and understanding their impact on firm performance.

1. Introduction

Today, firms are often faced by intensified global competition which forces the firms to adopt a niche strategy [1]. Competitive advantage in this strategy can be seen as stemming from the valuable and inimitable resources the firm possesses [2]. In today’s increasingly knowledge-intensive business environment, knowledge, and the capabilities of developing new knowledge are often the critical resources in providing competitive advantage [3-6].

However, in order to create valuable offerings, a firm needs access to complementary resources [7]. In the case of knowledge-intensive industries, this usually means various kinds of knowledge. For example, a generic software firm can complement its software development capabilities with the knowledge on a specific industry to build capabilities for developing industry-specific software. Through the development of this specific knowledge the firm is able to differentiate itself from the competition and hence attain competitive advantage. In addition, this industry-specific knowledge is required for successful adaptation of the software innovation in customer innovation [8].

Moreover, acquiring complementary knowledge once is not enough for the long-term success [9]. As markets and industries change [2], the focal firm needs to adapt to these new competitive environments by changing its knowledge base. Hence, the focal firm must be able to continually absorb and adopt new knowledge created outside its boundaries [5]. A firm aiming to sustain such knowledge-based competitive advantage needs to refresh its complementary knowledge on a regular basis to ensure that a fit exists between its offering and customers’ needs. Otherwise, the growing asymmetry between the customers’ needs and focal firm’s offering causes the focal firm to lose its competitive advantage.

One way to acquire this necessary complementary knowledge is through close collaboration with key customers [10]. The focal firm develops knowledge about the customer’s domain by developing a close relationship with these customers. Acquiring this knowledge has been shown to have a positive impact on the subsequent performance of the focal firm [10].

Instead of this dyadic relationship, in this paper we consider the entire business network of the focal firm as a potential source for complementary knowledge. This business network consists of firms that collaborate directly or indirectly with the focal firm to produce a valuable offering to the end customer of the focal firm. The collaborating firms form the nodes of the business network, while the business relationships form the relations between these nodes [11]. In practice, this network consists of firms that act as resellers and service partners of the focal firm. These firms often add their complementary knowledge to the offering of the focal firm, in the form of value-adding products and services. This network of firms acts as a channel for knowledge innovation and transfer [12]. In principle,
The business network of the focal firm would also include subcontractors and other upstream partners in the value chain. However, in this paper we concentrate on the downstream partners between the focal firm and its end customer.

The objective of this study is to examine the role of partners in a multi-disciplinary business network and investigate how a business network and partners can be leveraged to facilitate the knowledge transfer between the focal firm and its customers. The specific goals of this paper are, first to explore the mechanisms a firm can employ to leverage its business network to complement its own knowledge base in order to provide a compete and valuable offering to its customers. Second, we discuss the impact of successful combination of knowledge on the performance of the focal firm.

The main argument put forth in this paper is that when conducting business in a networked environment, the focal firm should make sure that the intermediate partners in the network have overlapping knowledge bases. This ensures that knowledge about customer domain, and conversely about the focal firm’s technological knowledge is transferred successfully through the network links from the focal firm to the end customer and vice versa. A corollary of this argument is that by successfully orchestrating the business network to facilitate knowledge transfer the focal firm is able to focus on developing its core competences, hence yielding comparative advantage when compared to an arrangement where it needs to also directly gather knowledge about the customer.

Our argument is based on a multiple case study of four Finnish enterprise software firms and their business networks. We apply an inductive approach akin to the grounded theory research strategy as prescribed by Strauss and Corbin [13]. However, for purposes of clarity we will present the results of the study in a more traditional manner. We first review the literature on knowledge transfer and business networks. Based on this review and empirical evidence, we next present the conceptual framework about the mechanisms and consequences of complementary knowledge acquisition that emerged during the empirical study. Finally, we present the main conclusions drawn from the empirical study and their implications for further research and managerial practice.

Our findings contribute to improved understanding on what knowledge acquisition mechanisms firms can use to update and maintain their knowledge on evolving customer needs without losing competitive focus. In particular, our analysis attempts to extend the management of complementary knowledge from a dyadic relationship to network environment.

2. Literature review

2.1 The knowledge-based view of the firm

We base our analysis of access to complementary resources on the knowledge-based view of the firm. In this perspective, a firm is seen primarily as an actor that develops and transmits knowledge [3,4,14]. Furthermore, a business network can be conceptualized as a constellation of knowledge-creating and knowledge-using firms [15]. Although the knowledge-based view of the firm has been criticized [16,17], it is nevertheless increasingly relevant as the knowledge intensity of businesses increases.

Knowledge is, of course, a multifaceted and vague concept [18]. In this study, we adopt the cognitive view on knowledge. In other words, we conceptualize knowledge as something that can be stored, modified and transmitted [19]. Even though we acknowledge that knowledge may also exist in tacit, non-codified form [14], we assume that all kinds of knowledge is always located within individuals or organizations and may be in most cases eventually be expressed in codified, explicit form [20-22]. This is in contrast to the constructivist view of knowledge, which sees knowledge as socially constructed and residing in human interactions and processes rather than in individuals themselves [23]. Knowledge may also be related to a plethora of domains; in our study, it is precisely this fact that forces the focal firm to seek out for complementary knowledge within its business network.

2.2. Core knowledge

The knowledge-based view posits that superior firm performance is gained by possessing knowledge that is valuable, rare and inimitable [24]. In fact, the often tacit form of firm-specific knowledge is hard to imitate by competitors and thus can provide competitive advantage [25], for example due to causal ambiguity [26]. We use the term core knowledge to mean the knowledge related to the specific skills, technologies, and competences of the focal firm that form the basis of its competitiveness. For example, in the case of software firms, core knowledge may mean knowledge related to a firm-specific technology. Possessing superior core knowledge thus provides competitive advantage vis-à-vis competitors in the same market.
2.3. Complementary knowledge

However, to profit from technological innovation, the focal firm must often be able to access necessary complementary resources [7]. In our case, this means gaining access to complementary knowledge about the customers’ business domain. We use the term complementary knowledge to mean this type of knowledge. Without this knowledge, the value creation potential of the focal firm’s valuable core knowledge may be limited, as the offering remains incomplete and less valuable in the eyes of the customers. In addition, the successful implementation of the product in a customer environment requires some level of knowledge about the customers’ domain [8]. Furthermore, some level of complementary knowledge is required to enable successful absorption of customer knowledge [27] that enables the focal firm to adopt its offering to changes in the customers’ business.

Together, the core and complementary knowledge a firm possesses is called the knowledge base of the firm. While what constitutes cores knowledge is viewed from the point of view of the focal firm, each firm in the partner network posses a specific mix of both core and complementary knowledge.

2.4 Knowledge transfer

Success in knowledge-intensive markets requires a combination of core and complementary knowledge. While the focal firm usually develops core knowledge internally, complementary knowledge may be accessed through interorganizational knowledge transfer. As suggested by Nonaka’s knowledge creation processes of socialization, externalization, codification and internalization, both codified and tacit knowledge may be transferred [14]. Since knowledge is always “sticky” and localized to a certain degree [28], transfer of only codified knowledge is limited in its comprehensiveness.

Whether or not to access required complementary knowledge through knowledge transfer has important implications for the success of the focal firm. Without sufficient complementary knowledge, the core knowledge may prove worthless [7]. Yet the firm as a whole has limited resources, and hence directing resources to complementary knowledge creation may have an adverse effect on the development of core knowledge. Since unique core knowledge is ultimately the source of competitive advantage for the focal firm [24], concentrating on complementary knowledge development may actually have a negative impact on the performance of the focal firm.

2.5. Models of knowledge transfer

The focal firm has several potential options for accessing the complementary knowledge of its customers’ business domain. First, it may access this knowledge through licensing [7]. This form of knowledge transfer relies entirely on codified knowledge, and is thus limited in scope. Furthermore, licensing knowledge is also limited to knowledge that is commercially valuable to the customer, which often is not the case – the required customer domain knowledge may simply not be available on the market. The benefit of licensing readily codified complementary knowledge is that it does not require large resource investments.

Second, the focal firm may acquire complementary knowledge from direct collaboration with the customers, as a form of learning-by-doing [29,30,10]. This form of knowledge transfer facilitates the transfer of tacit knowledge in addition to codified knowledge through socialization and internalization, as employees of the focal firm and customer firm work together to develop a solution to customer’s problem. Previous research has shown that this is an important way of acquiring valuable knowledge about the customer’s business domain [10]. Even though this model of knowledge transfer does not require additional resources, it does disperse the human resources of the focal firm. Resources that are used to collaborate with the customer organization could instead be spent on developing core knowledge.

Third, the focal firm may acquire the required knowledge through human resource management, in particular through recruiting new employees who are knowledgeable about the customers’ business domain [31]. This potentially provides the focal firm with both codified and tacit complementary knowledge, but risks growing the focal firm headcount needlessly. In addition, this mode of knowledge acquisition may also serve to disperse the resources of the focal firm, as relatively speaking fewer resources are used on the development of core knowledge. Also, recruiting a new employee is typically a one-time acquisition of complementary knowledge, as the new employee becomes socialized in the new organization and loses touch with the customer domain [31].

However, none of the above options for accessing complementary knowledge is fully satisfactory. As customers’ business domain may be far from the focal firm’s business domain, there may be large costs involved in acquiring and maintaining necessary complementary knowledge. Furthermore, as a significant part of the knowledge about customers’ business is likely to be tacit and hence hard to transfer, the knowledge transfer models relying solely on the transfer of explicated and codified knowledge
are unlikely to be successful. Therefore, the focal firm may want to resort to alternative methods of accessing the complementary knowledge about its customers’ business. One such possibility is the use of business networks and partners to provide necessary complementary knowledge [12,11]. Unlike the licensing of already codified knowledge [7], this approach also taps into the tacit dimension of the customers’ business domain knowledge. By collaborating in close contact with its partners, who in turn collaborate with the end customers of the focal firm, at least part of the customers’ business domain knowledge may be available to the focal firm. In essence, partner firms act as boundary spanners [32] and innovation intermediaries [33] between the focal firm and its customers. Summary of characteristic of the discussed knowledge acquisitions mechanisms and their hypothesized impacts on the focal firm’s performance are presented in Table 1.

<table>
<thead>
<tr>
<th>Knowledge acquisition mechanism</th>
<th>Taps into tacit form of knowledge (+)</th>
<th>Taps into codified form of knowledge (+)</th>
<th>Accumulation of excess organizational resources (-)</th>
<th>Focused organizational resources (+)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Licensing</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>Learning-by-doing</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Acquiring human resources</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes / No</td>
</tr>
<tr>
<td>Using business networks and partners</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
</tr>
</tbody>
</table>

3. Data and Methods

3.1. Case study methodology

We arrived at the described theoretical framework through empirical study. We conducted a multiple case study of four Finnish software firms. Case study is the study of phenomena in their natural environment, and is suited to situations where the phenomenon cannot be easily controlled [34]. In addition, case study methodology supports theorizing on new phenomena and the emergence of new theory based on the case data [35]. As our objective was to explore the phenomenon of complementary knowledge acquisition in business networks, we deemed case study methodology suitable for our purposes.

We applied an abductive case study methodology in our research [36]. In this methodology, based on abductive inference [37], theory and empirical data are continuously matched through the processes of matching and direction/redirection. In other words, iteration between data and theory results in insights that are compatible with both theory and empirical evidence. In practice, this meant directing further data collection in terms of case selection, informant selection and interview questionnaire development based on previous findings. We iterated until theoretical saturation was reached, which we judged to happen when no new themes or insights emerged from additional interviews and cases.

3.2. Sampling and data collection

We chose to select the cases for our study from the population of Finnish enterprise software firms. These firms deliver complex software systems based on software products developed by themselves. This is archetypically a very knowledge-intensive market, and requires both good knowledge of relevant technologies and customers’ business domain. In other words, enterprise software firms are likely to encounter the challenge of combining technological knowledge with complementary knowledge as described in introduction. We also had good access to top management of a large number of relevant firms. This was important as the subject of the case studies was related to the strategic management of the firms.

The unit of analysis was a single enterprise software firm. In principle, analyzing knowledge exchange in business network context would require considering the position of the focal firm’s partners [38]. However, for practical reasons we concentrated on the focal firms in this initial study.

In case study methodology, the selection of cases is based on theoretical or purposeful sampling rather than on random sampling [34]. We used both literal and theoretical sampling to select further cases. In literal replication, subsequent cases after first case are selected based on the expected similarity in case characteristics and impacts. In theoretical replication, additional cases are chosen based on hypothetical effects indicated by a theoretical framework [34]. We used theoretical sampling to provide a representative sample of the firms relevant to our study. We sampled our population of interest according to our
sampling strategy, illustrated in Table 2. This sampling was based on two dimensions: level of turnover and internationalization, measured by the share of revenue received from abroad. For the purposes of this study, we selected one software firm from each quadrant of our sampling strategy. All included software firms targeted enterprise customers. To further improve the external validity of our findings, we case firms that targeted different industries. Selected case firm and their characteristics are listed in Table 3.

In each case, we first selected an informant that was deemed to know most about the business network. Based on the insights emerging from each interview, the interview questionnaire was updated, and additional informants where chosen from each case. This was continued until saturation was reached in each case. The selection of further informants was based on their knowledge about the studied phenomenon, and the information provided from previous informants in each case. In addition, we stipulated that a minimum of two informants be interviewed in each case firm to avoid informant bias [39,40]. Informant bias was also controlled by conducting the interview at case firm premises and providing the informants with questionnaires beforehand. Both served to reduce the time and trouble required from informants to participate in the study.

For each case firm, we conducted 2-4 semi-structured interviews to extract rich data on predefined themes, such as collaboration strategies and focal firm’s complementary knowledge on the customer’s business domain [41]. Development of the interview guide was based on the derived theoretical framework. We pretested our initial interview guide with two managers from two additional case firms. Based on this pretest, the guide was updated to a moderate degree. The actual outcomes of this pilot study were not included in the results of this study, because they may have potentially caused bias. The final interview guide is available upon request.

Table 2. Sampling strategy

<table>
<thead>
<tr>
<th>Level of internationality*</th>
<th>Quadrant Two</th>
<th>Quadrant One</th>
</tr>
</thead>
<tbody>
<tr>
<td>High</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Low</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Level of turnover*</th>
<th>Quadrant Three</th>
<th>Quadrant Four</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low</td>
<td></td>
<td></td>
</tr>
<tr>
<td>High</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* Turnover below 5 M€ represents low level, 5 M€ and above represents high level.
** Below 25 % of all revenues coming from abroad represents low, 75 % and above represents high.

In total, we conducted 10 semi-structured interviews in the four case firms. Each interview was conducted by a single researcher. Interviews lasted for 40-60 minutes, and they were recorded digitally. Recorded interviews were sent to external service provider for transcription. In addition to interview transcripts, notes were taken during the interviews on the impressions based on the interviewee and ideas emerging during the interview. These notes were then analyzed and documented within 24 hours of the interview. Together, the transcribed interviews recordings and field notes amounted to a total of 90 pages of text used for subsequent analysis.

Table 3: Case characteristics

<table>
<thead>
<tr>
<th>Case</th>
<th>Quadrant*</th>
<th>Vertical</th>
<th>Size**</th>
<th>Total Interviews</th>
<th>Interviewees</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alpha</td>
<td>One</td>
<td>Building and Construction</td>
<td>Large</td>
<td>4</td>
<td>Senior Vice President of Product Development, Executive Vice President, Director of Product, Senior Vice President of Nordic Area</td>
</tr>
<tr>
<td>Beta</td>
<td>Two</td>
<td>Biotechnology</td>
<td>Small</td>
<td>2</td>
<td>CEO / Member of the Board, R&amp;D Manager</td>
</tr>
<tr>
<td>Gamma</td>
<td>Three</td>
<td>Finance</td>
<td>Small</td>
<td>2</td>
<td>CEO / Chairman of the Board, Sales Manager</td>
</tr>
<tr>
<td>Delta</td>
<td>Four</td>
<td>Industry and Trade</td>
<td>Large</td>
<td>2</td>
<td>Business Development Director, Sales Director</td>
</tr>
</tbody>
</table>

* Refer to our sampling strategy for quadrant explanations, presented in Table 2.
** Large: more than 100 employees; Medium: 20-100 employees; Small: less than 20 employees.
3.3. Data analysis

The data were initially analyzed using the coding strategy defined by Strauss and Corbin [13]. In other words, instead of starting with an a priori list of constructs, we relied on the collected data for emerging constructs. More specifically, the data were first analyzed paragraph-by-paragraph using open coding. During this phase, each paragraph was analyzed for concepts, causal relationships and environmental factors mentioned by informants [42]. Each identified concept was then coded to a code in the emerging codebook. The constant comparison method was used to continually compare the emerging framework with further data. In other words, whenever new concepts emerged in the interview texts, the codebook and the preliminary framework were updated to incorporate this additional evidence.

During axial and selective coding, the codes and data initially analyzed during open coding were further distilled to identify overall themes and concepts emerging from the data. These phases included operations in which the data is broken down, conceptualized and integrated in new ways to allow for the potential new theory to emerge.

Following Strauss and Corbin [13], we analyzed the data in parallel with the data collection which in turn was guided by theoretical sampling. At the outset, we entered the field with as few a priori assumptions as possible regarding the potential findings of this study. After each round of interviews, we analyzed the data using the tools and methods of grounded theory, and guided by theoretical sampling, we returned to the field to collect new data until the point of theoretical saturation was reached. We also purposefully overlapped data collection and data analysis activities to improve the interaction between these two phases of empirical study [35]. For example, the interview guide was modified based on previous cases.

4. Results

Based on four case studies of Finnish software firms, we found specific patterns of core and complementary knowledge distributions in a firm’s multi-disciplinary business network that facilitates the inter-organizational knowledge transfer between the firm and its customers. Such knowledge distributions patterns improve the performance of the focal firm by enabling it to focus on its core competencies and by providing rich market feedback.

Knowledge intensities of these distributions seem to be functions of network distance from the focal firm when viewed across the partner network towards the focal firm’s customers. Knowledge on focal firm’s core competencies is highest when the distance is zero, and as the distance increases, the level of such knowledge diminishes. Finally, at the end of the distance spectrum, where the focal firm’s customers reside, this knowledge is low.

Distribution of complementary knowledge is thus negatively related to the distribution of the core knowledge in relation to distance from the focal firm. That is, the complementary knowledge on the customers’ domain is low when the network distance is zero, and as the network distance from the focal firm grows, the knowledge on customers’ domain increases. Naturally, at the end of the distance spectrum.

![Figure 1: Knowledge distributions in the focal firm’s multi-disciplinary business network](image-url)

Legend:
- Core knowledge (knowledge on the focal firm’s core competence) in the business network
- Complementary knowledge (knowledge on customer’s core competence) in the business network

Figure 1: Knowledge distributions in the focal firm’s multi-disciplinary business network
spectrum, where the customers reside, the complementary knowledge intensity is high. These findings on the knowledge distributions in a multidisciplinary business network are illustrated in Figure 1.

Such knowledge distributions in the business network enable the focal firm to focus on its core knowledge, which, in turn, is hypothesized to have a positive effect on the firm’s performance. Partner network bridges the knowledge gap between the focal firm and its customers by providing a knowledge transformation channel that connects the otherwise separated knowledge bases through partners’ partly overlapping knowledge bases, as illustrated in Figure 2. We use the term knowledge transformation channel to depict a network constellation that enables a transformation of knowledge from one domain to another.

Such business network constellation enables the focal firm to receive rich market feedback that it can use to refresh its knowledge on the customers’ domain, that is, the complementary knowledge. Furthermore, this arrangement also allows the focal firm to enhance the customer fit of its offering.

5. Discussion and conclusions

Finding the optimal, value-maximizing balance in the business network between the development of core knowledge and complementary knowledge is a challenging yet crucial task that has a significant impact on the long-term performance of a firm. Our findings contribute to our improved understanding on how the focal firm can find the balance by leveraging its business network. In particular, our study extends the consideration of knowledge acquisition from the dyadic relationship between the focal firm and its customers or partners to networked environment comprising multiple actors.

Delicate balance of distinct competencies, knowledge and their distributions in the business network facilitates the inter-organizational knowledge transfer, and more importantly, it enables the focal firm to focus on its foremost competencies because the downstream business network partners handle the distinct core knowledge that is required to communicate effectively with the customers. Moreover, such business network partners provide rich market feedback to focal firm, which is essential for the firm to stay on top of the evolving customer needs. Periodical rich market feedback updates focal firm’s knowledge on customers’ domain, which, in turn, enables the firm to maintain appropriate customer fit in the offering. Such partners are also effective sellers and distributors of the focal firm’s offering, because they are familiar with the customers’ domain and the corresponding business needs.

An example drawn from the software industry might include, for example, a software firm that is targeting finance industry and a capital investment firm. In such dyadic business network constellation the software firm may fail to effectively communicate with the customer and extract rich market feedback due to the lack of overlapping knowledge bases. However, the software firm can bridge the knowledge gap by employing partners that have partly overlapping knowledge bases and that enable gradual
transformation of knowledge from customer’s domain to the focal firm’s domain, and vice versa. Such knowledge transformation channel seems to have a profound impact on functionality of the business network and eventually on the financial performance of the focal firm.

The number of mediating partners between the focal firm and its customers seems to depend on the gap between the knowledge bases, time constraints and their inherent characteristics that affect the inter-organizational knowledge transfer. While a number of partners may be required to build a fluent flow of knowledge between the focal firm and its customers, the number of mediators can be reduced by increasing the time and resources allocated for the interaction between the focal firm and its closest partner.

On the aggregate, however, it seems that the marginal benefit of adding mediating partners is highest when the first mediator that adheres to the same business domain as the focal firm’s customer is employed within the business network. After the first partner, the marginal benefit of adding further knowledge mediators seems to quickly approach zero.

Nevertheless, when a corporate strategist is planning the business network constellation, the customer interface should dominate. That is, if only one partner lies between the focal firm and its customers, the partner should share the same knowledge base as the customers to effectively communicate and share knowledge, both codified and tacit. Such partners can extract rich market feedback on the exact needs of the customer, which in turn, can later be incorporated into the focal firm’s offering to enhance its customer fit.

Refreshing knowledge on evolving customer needs and maintaining appropriate customer fit of the offering is imperative for the long-term competitiveness of the focal firm.

5.1 Implications for theory and research

Our study suggests that otherwise separate knowledge bases of a focal firm and its customers can be brought closer to each other by employing the partner network in between them. The partner network is likely to contain partly overlapping knowledge bases forming a continuum from complementary knowledge about the customer’s business domain to the core knowledge developed by the focal firm. This network potentially enables transfer of both explicited and tacit knowledge in both directions in the network. From the focal firm’s point of view, successful knowledge transfer through the business network provides an efficient access to required complementary knowledge. Our findings and theoretical considerations suggest that a sufficient overlap in the knowledge bases of adjacent network actors is required for successful knowledge transfer, for example due to requirements of absorptive capacity.

A combination of core and complementary knowledge is required to produce and deliver a valuable offering to the customers. In comparison to other models of knowledge transfer, facilitating the business network has the relative benefit that it allows the focal firm to concentrate its resources on developing unique core knowledge, while providing sufficient access to complementary knowledge. The unique core knowledge can then provide the focal firm with competitive advantage, and hence superior market and financial performance.

In addition, the network model of knowledge transfer also carries the benefit of greater flexibility: when environment and customer needs change, it is easier for the focal firm to access the required complementary knowledge through new partners instead of developing it in-house or acquiring it through employee recruitment. The network model thus provides a competitive advantage during potentially rapid changes against competitors who rely on other models of knowledge acquisition.

5.2. Managerial implications

In this paper, we have analyzed the mechanisms of acquiring complementary knowledge by leveraging existing business network, and how success in this activity affects the performance of the focal firm. Our results indicate that to successfully complement its own core knowledge, the focal firm can use its partners to provide necessary complementary knowledge about customers’ business.

In practice, this implies that managers need to consider the role of partners in knowledge development. In more concrete terms, partners and resellers in the business network can provide the focal firm with complementary knowledge about the customers’ business domain and thus enable the focal firm to develop a valuable offering based on its own knowledge of on its own core competences, such as software technologies and management methodologies. An illustration of such partner-enabled process for maintaining complementary knowledge is presented in Figure 3.
5.3. Limitations and quality of the study

However, this study is subject to a number of limitations. First of all, idiosynchronous features of the selected industry context – the software industry – may have affected the results. In other words, it is possible that the results may be less clear or dissimilar in other industries. In less knowledge-intensive industries, possessing overlapping knowledge in the business network may not be as important.

Secondly, we have addressed the phenomenon only through qualitative research methods. Although the aim of this study was not to provide a fully generalizable framework of complementary knowledge acquisition, relying on case studies limits the external validity of the study. Further research should aim to improve this through the use of quantitative research design. Third, using other data, such as quantitative external measures, and accounts from network actors beside focal firms could have provided better internal validity through data triangulation [43].

Fourth, the current study has only considered the impact of abstract network distance on knowledge transfer. Other types of distance, such as geographical and cultural distances are also likely to have an impact on the success of complementary knowledge acquisition. Furthermore, factors such as trust and commitment of partners, as well as the lifecycle phase of the underlying core technology most likely affect knowledge transfer efforts. Incorporating these elements to the basic framework developed in this paper seems a fruitful avenue for further research.

6. Acknowledgements

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7. References


