

Organizational Collaborative Model of Small and Medium Enterprises in the Extended Enterprise Era

Lessons to Learn from a Large Automotive Company and its dealers's network

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Abstract. Large firms tend to overlap their boundaries in unstable environments and create strategic alliances and collaborations with their suppliers, customers and partners. In the automobile sector, firms are extended enterprises continuously innovating and creating new products through their dynamic capabilities. A large automotive company seeks to leverage its relationships with its customers and suppliers through networks creation. More specifically, partnering with the organizations, constituting a Dealers' network- providing after sales services to customers as assisting, selling, and repairing cars. The dealers' network consists of small and medium organizations that represent the automotive company and are the intermediary among it and its customers. Through this research, we are elaborating a model representing the collaborative relationship among the automotive company and its dealers' network that leads to knowledge creation and sharing about the automobiles components and services of this extended enterprise. We present a model illustrating the dealers' network organization and its interaction with the large firm. The collaborative knowledge network (CKN) contributes to the sustainability of the new product development (NPD) process of the automotive company.

1 Introduction

In the digital era, the extended enterprise is continuously creating new collaborations with external actors basically on information and communication technologies. Besides, it is aware of the importance of external actors in the creation of innovative products. Gathering external actors -especially professional and expert ones, in networks in which they can create and share their know-how and experience, is a critical step toward integrating strategic knowledge in the new product development of the extended enterprise that has

absorptive and dynamic capacities to keep up with the complex business environment.

In this paper, we are presenting the case of a large automotive- extended enterprise that decided to take action and takes care of its dealers network that are external actors interacting directly with the customers of the EE. We first present a literature review to clarify the reasons behind the importance of partnering with external actors for new product development and innovation, then we describe the CKN among the EE and its dealers' network, and finally we discuss the organizational, technological and strategic dimensions of these interactions presenting some challenges facing the CKN and also especially some important factors that are leading to the success which is the creation, sharing and integration of knowledge in the new product development process of the extended enterprise.

2 Literature review

2.1- Strategic alliances with external actors for innovation

The complexity and increasing turbulence of the environment is leading the extended enterprise to seriously strengthen its inter-firm relationships for knowledge creation and competitive advantage. The strategic alliances are important for business performance and innovation. Many scholars have studied the relationship among a firm strategic alliances and its innovative performance [1-3] Thus, we consider the capabilities to manage strategic alliances and the related organizational capabilities of learning and communicating as key-enablers for the process of knowledge creation and sharing. The strategic alliances are efficient instruments allowing access to external resources and overlapping firm's boundaries [4], therefore firms focus on knowledge acquisition and sharing through the network of partners. Strategic networks [5-6], as the strategic alliances, are composed of inter-organizational ties that are based on social, professional and exchange relationships. Thus, collaboration at the inter-firm level is a critical vehicle of the exploration of novel technologies and capabilities. For instance, in automobile development studies, collaboration between firms enhances the knowledge exchange for exploratory problem-solving in product development process [4, 7-9].

For the creation of competitive advantage, the involvement of external actors in the new product development is essential. Thus, innovation is distributed across different actors such as lead users [10-11] in order to extend the areas of innovators outside the firm. Considered as co-creators, the external actors are regarded as partners and their knowledge is integrated in the innovation process of the extended enterprise [12] and work jointly and efficiently. Besides, since innovation is a complex process, firms adopt systemic approaches to manage knowledge. Thus, it is a good strategy to adopt knowledge management systems to capture, create and use knowledge to enhance the organizational performance. The process of knowledge exploration and exploitation is speeding up the new product development process and innovation may require the creation of organized entities representing the external actors such as research groups, communities of interest, communities of practice [13-14] and other organizational structures that are separated from the main organization but still

connected to it [15]. The information and communication technologies play the role of enablers of communication activities among the external actors-combined into entities- and the main organization. Through the use of information and communication technologies, the interaction among the firm and its external actors groups is leveraged and new knowledge is integrated in the new product development process.

2.2 The virtual communities of practice

The information and communication technologies allow organizations to overlap their boundaries and be more open to collaboration and cooperation. The use of ICTs creates a virtual environment in which its inter-organizational distributed members –in space and time [16] can effectively work toward a common goal [17]. The authors [18] define the virtual organization as one that coordinates operations, among people from different locations, using ICTs. The authors [16] define the virtual team as ‘a group of people who interact through interdependent tasks guided by common purpose’ across organizational boundaries using communication technologies. The virtual organization is characterized by an inter-organizational relationship- based on information technologies- in which knowledge is shared and created [19].

The use of virtual teams for new product development is rapidly growing and organizations can be dependent on it to sustain competitive advantage. To accelerate the innovation process, the use of virtual communities of practice (VCoP) is becoming an important way to access external actors novel knowledge. The ICT-based collaboration for knowledge sharing among cross-border virtual teams members generates positive impacts on the new product development of the organization.

The virtual communities of practice are ICT-based communities of practice (CoP) which bring together a group of people sharing a concern, a set of problems, an expertise or a passion about a topic [14, 20]. The CoPs are usually spontaneously emerging groups [14], however, in the actual unstable environment, organizations play an important role in their creation, support and development [21].

Furthermore, many scholars showed the role of trust through an efficient ICT-based collaboration. Trust is no longer a matter of face to face interactions. Within the virtual community of practice, the members are the basis for its efficiency; If members have strong ties, trust is one of the key determining factors for achieving innovative outcomes. In the VCoP, not all members know each other, thus acting as if trust is already existing and this is referred to as the swift trust developed by [22]. As the VCoP grows and its achievements are tangible as swift trust becomes more important.

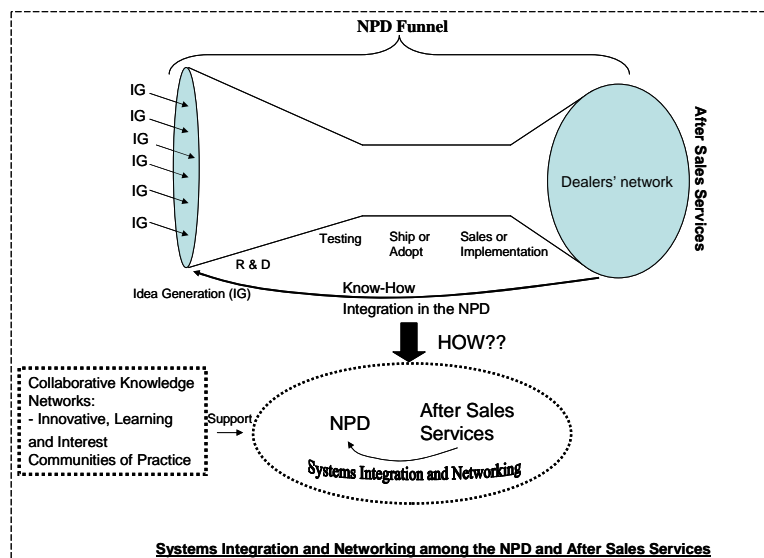
The authors [23] have developed strategies and behaviours to facilitate trust building in virtual teams. Among others, optimistic team-spirit and dynamic leadership are of high importance. The first one is related to motivation; motivation raises trust [24] and knowledge sharing, in the VCoP, requires motivation and more precisely intrinsic motivation. For that, reward systems are efficient methods providing incentives to the VCoP members. In the literature, there are two different points of view regarding the reward systems; some state the non-financial (intrinsic) reward systems contribution to the enhancement of knowledge sharing [25, 26], whereas others discuss the financial (extrinsic) [27] reward systems; our case study uses a non-financial reward system.

On the other side, dynamic leadership is related to the catalysts monitoring and organizing the entire virtual community of practice. The development and performance of the VCoP is also depending on the catalysts. In the literature, they are called knowledge brokers [28-29] and gatekeepers [30-31]. The gatekeeper is a boundary spanner responsible of monitoring the external knowledge coming inside the organization and deciding on the relevant knowledge to the innovative activities of the organization.

3 Case study

3.1 Our model: The innovation funnel of the automotive company

By applying the concept of the innovation funnel, the dealers' network know-how can be integrated in the NPD processes, and by this increasing the innovative performance of the automotive company. The innovation funnel represents the innovation steps by which the product goes before being produced. The automotive company is following the fifth generation innovation model based on [32]. This model- Systems integration and Networking (SIN) model considers the creation of networks for the integration of new expertise and know-how in the innovation process. In fact, by creating networks among the dealers' network and NPD process of the automotive company, it is possible to improve the innovative performance of the extended enterprise.



Besides, as an extended enterprise, the automotive company has unclear boundaries and applies a win-win approach with its partners. For that, its interactions with the dealers' network take the shape of CKN [33] in which knowledge is created and shared. Therefore, the CKN for learning and

knowledge sharing allows the continuous development of the innovation process.

3.2 Research questions

Through this paper, we are elaborating a model representing the collaborative relationships among the automotive company and its dealers' network that leads to knowledge creation and sharing about the automobiles components and services of this extended enterprise.

To address this issue, this study framed the following research questions:

- How are the mechanisms involved in the interaction among the extended enterprise and the dealers' network?
- How do the collaborative tools and processes impact on the CKN?
- What are the successful outcomes and challenges of the CKN among the extended enterprise and the dealers' network?

3.3 Research Method

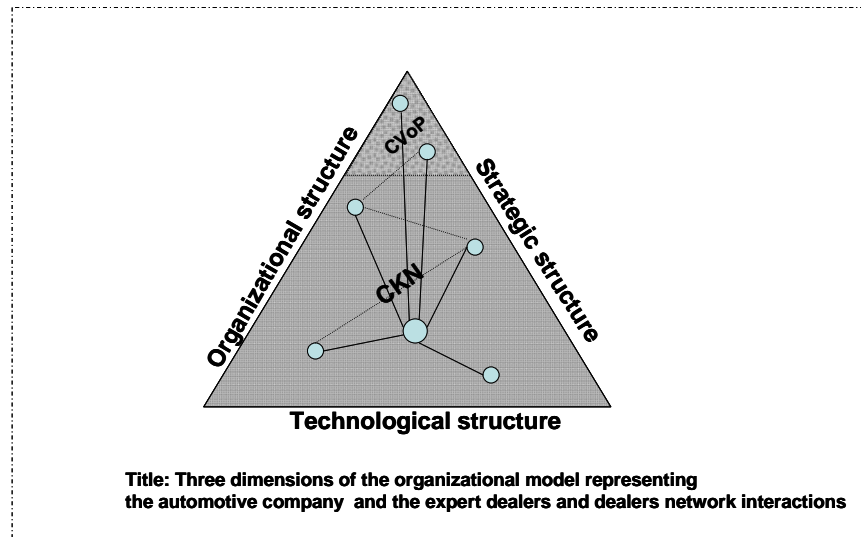
Research into the CKN was undertaken using case study method [34]. Individuals involved in the management of the CKN were identified and interviewed using a semi-structured questionnaire. The reason behind choosing this type of interviews is to encourage the interviewees to provide detailed, elaborated answers. The interviewees are the top-managers responsible of the entire dealer's network, and the middle managers responsible of specific activities carried out within the CKN. Thus, data were representing different levels and perspectives of management.

Besides, we analyzed the state of the art of the interaction among the dealers' network and the automotive company. We noticed that the CKN among the automotive company and the dealers' network is mainly supported by information and communications technologies and professional trainings for knowledge sharing and learning. Through a questionnaire, dedicated to the members of the dealers' network, we investigated on the perceived ease of use and usefulness of those two previous main collaboration means in the development of the CKN. This questionnaire was dedicated to a significant representing sample from the very large population of the dealers' network.

4 Exploratory Results and Discussion

The interaction among the automotive company and the dealers' network takes the shape of a collaborative knowledge network through which informal and formal linkages are created. The main player in the CKN is the automotive company orchestrating the interaction among all the actors of the CKN. The dealers' members of the CKN are embedded to the EE through weak and strong ties. However, some CKN members have an additional special relationship with the EE in which they interact directly with it; they formed a virtual community of practice (VCoP) in which more technical knowledge is shared and integrated in the new product development of the EE.

The organizational, strategic and technological dimensions of the interaction among the CKN members represent the way in which the EE deals with its external partners providing after sales services to the EE customers. Through the following sections, we describe the three dimensions of the embeddedness in the form of mechanisms to explain the interaction among the CKN members, the success factors providing competitive advantage to the EE and some challenges to analyze in order to sustain the EE development.



4.1 Collaborative knowledge network mechanisms

On one hand, mainly, most of the collaboration among the automotive company and its dealers' network is ICT-based. Many tools are used to satisfy different purposes but always creating a bi-directional knowledge sharing environment among the automotive company and the dealers' network. For instance, one of the IT tools, analyzed during the research, is dedicated to solving technical problems related to cars. An efficient procedure is followed in which one of the dealers' network members communicate interactively the car problem faced to the automotive company and this later gives feedbacks to the entire dealers' network in the form of e-service news, thus, spreading one CKN member knowledge in the whole CKN- this is a part of the codification strategy [35] of the automotive company in which it calls for a high codification infrastructure which results in more knowledge reuse via person-to-document exchange.

Another instance is when the automotive company provides the dealers' network, on a regular basis, with an updated IT tool for diagnosis analysis for the inconveniences in cars brought by customers in the dealers' workshops. These tools support the technicians in their labor on cars. Thus, through the diagnosis tool, the automotive company shared its knowledge with dealers about the way the inconveniences in cars might be discovered.

On the other hand, the CKN is profiting from professional trainings for knowledge sharing. The purpose of the professional trainings is to gather the members of the dealers' network, in a face-to-face manner, to share their knowledge with each other and especially to grasp and exchange new knowledge

with the automotive company. The technicians of each dealer's network member are the main focus of these initiatives since they are the knowledge workers directly interested by the professional trainings. In fact, in addition to the IT tools mentioned in the first paragraph, the professional trainings are efficient means of creating, processing and enhancing the technical knowledge of the dealers' network knowledge workers.

The ICT-based collaboration among the CKN members encouraged the creation of work groups, and communities mainly based on ICTs. For that, the expert dealers VCoP do not meet any barriers to its development. Since the expert dealers are already adapted to the use of ICTs provided by the automotive company, the ease in which they use the VCoP webpage to share their knowledge allow us to state that the VCoP relies productively on ICTs. The expert dealers VCoP webpage is hosted by several other ICTs used by the entire dealers' network, but obviously only the members have access to it.

4.2 Some success factors

There are many factors leading the CKN to be successful and innovative. From the organizational point of view, the CKN members are all from the same country which facilitates communication and avoids possible misunderstandings that might occur generally as a result of different cultures, and more specifically as a result of different work processes, different languages, and/or different types of leadership [20]. In fact, belonging to different enterprises and being geographically dispersed in their nation did not create any major obstacle to their collaborative knowledge network. As small and medium enterprises, and independent organizations from the automotive company, the dealers' network members take advantage of the ICT-based collaboration and of the sustainable opportunities offered by the automotive company to create an inter-organization collaboration based on trust and motivation.

Besides, the expert dealers have some privileges in comparison with the other dealers in the network, thus, this can encourage the dealers' network members to work more dynamically to attempt to integrate the VCoP. In fact, as members of the VCoP, the expert dealers have more advantages than other dealers in the automobile market; Informing the dealer's customers of its membership in a dynamic VCoP created by the automotive company can have a positive impact on the image and credibility of the dealer and offer the VCoP members prerogatives in the dealers' network.

The VCoP members receive direct resources from the EE and are officially sanctioned by the organization. Since the VCoP has been created by the automotive company, it is fully financed by this later and even provides incentives to the expert dealers to increase the chance of their participation to the VCoP; The reward system is non-financial and provide good incentives to the VCoP members each time their contribution to the VCoP is valuable and significant. Thus, the organizational structure of the VCoP promises significant outcomes and important changes in the new product development of the automotive company.

The main objective behind the creation of the expert dealers VCoP is the integration of their know-how in the new product development process of the large automotive company. For that, the VCoP catalysts consider the expert dealers as dynamic and in possess of innovative capacities that contribute to the sustainability of the products and services of the automotive company. Not only

does the VCoP catalyst have the expert dealers trust, built through a long-term collaboration with the automotive company, but they also show them that their participation in the VCoP is very significant and highly appreciated by the EE. This creates a sense of belonging and motivation among the VCoP expert dealers and they fully agree on sharing their know-how and experience with the automotive company through the expert dealers VCoP.

In addition to their role as leaders in the expert dealers VCoP, the catalysts are also the gatekeepers of the community. In fact, they are the ones responsible of filtering the knowledge shared by the expert dealers and evaluating its relevance to the new product development process of the automotive company. As a strategic position in the VCoP, the gatekeeper must have expertise in the dealers' field and have a critical attitude toward the knowledge shared to extract the most relevant one.

4.3 Some challenges

The main issue that can probably slow down the CKN operations is the computer self-efficacy [36] of the dealers' network members. In fact, computer self-efficacy refers to a judgment of one's capability to use a computer. The dealers' network members are small and medium enterprises consisting of average skilled technicians in ICT use, thus, often their use of computer is limited since their work-focus is mainly cars. However, the automotive company is aware of that and offering professional trainings and tutoring to facilitate the dealers' network members understanding of the importance of being able to use computers in their everyday work.

Besides, it is important to mention that the dealers' network members' perceived ease of use and usefulness of the IT tools provided for the collaboration in the CKN is critical for an efficient collaboration. Perceived usefulness is defined as the degree to which a person believes that using a particular system would enhance his or her job performance [37] and perceived ease of use, in contrast, refers to the degree to which a person believes that using a particular system would be free of effort [37]. These two concepts are directly connected with the computer self-efficacy level of the dealers' network but also with the efficiency of the IT tools provided by the automotive company. These two concepts give good insights on IT elements that might need some modifications for better outcomes.

Finally, concerning the CKN organizational structure, we noticed that the small and medium dealers enterprises have different connections' types with the automotive company; the medium enterprises are connected directly and have strong ties with the EE, whereas the small ones have weak ties with the automotive company since the medium ones play an intermediary role among them and the automotive company. According to [38], weak ties increase innovative capacities, allows a faster working process, and facilitates access to resources. However, the small dealers' enterprises still have some difficulties to access IT resources because of the medium ones' intermediary role.

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