Collaborative Knowledge Networks

Lessons to Learn from a Large Automotive Company

Nouha Taifi
eBusiness Management Section, ISUFI, University of Salento,
Via per Monteroni, 73100, Lecce, Italy, nouha.taifi@ebms.unile.it,
http://www.ebms.it

Abstract The actual unstable environment leads firms to overlap their boundaries and create strategic alliances and collaborations with their suppliers, customers and partners. Our automotive company case is an organization that is applying this concept. As an extended enterprise, it continuously innovates and creates new products using its dynamic capabilities. It seeks to leverage its relationships with its customers and suppliers through networks creation. In order to develop further toward being an extended enterprise, its actual focus is on a partnership 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. 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

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.

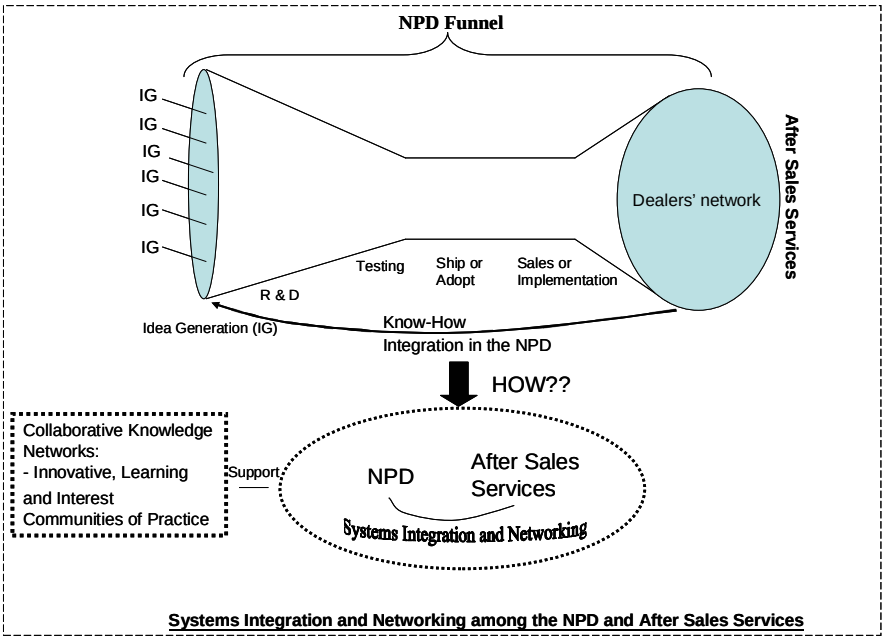
The process of knowledge exploration and exploitation is speeding up the new product development process and innovation may require the creation of organized entities representing the external actors such as research groups, communities of interest, communities of practice [13-14] and other organizational 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.

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 [16]. 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 [17] 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 [18]. 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

4.1 Collaborative knowledge network mechanisms

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 [16]. 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.

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.

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 facilitate communication and avoid 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.

4.3 Some challenges

The main issue that can probably slow down the CKN operations is the computer self-efficacy [21] 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 [22] 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 [22]. 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 [23], 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.

References

1. W. Shan, G. Walker, and B. Kogut, Inter-Firm Cooperation and Start-up Innovation in the Biotechnology Industry, *Strategic Management Journal, A* 15(55), 387-394 (1994).
2. J. A. C. Baum, T. Calabrese, and B. S. Silverman, Don't Go it Alone: Alliance Network Composition and Startups' Performance in Canadian Biotechnology, *Strategic Management Journal, A* 21 (3), 267 – 294 (2000).
3. J. Lerner, and A. Tsai, Do Equity Financing Cycles Matter? Evidence from Biotechnology Alliances", *Journal of Financial* Economics, Elsevier, *A* 67(3), 411-446 (2003).
4. A. Takeishi, Knowledge Partitioning in the Inter-Firm division of labour: The Case of Automotive product development, *Organization Science, A* 13(3), 321-338 (2002).
5. R. Gulati, Alliances and Networks, *Strategic Management Journal, A* 19, 293-317 (1998).
6. R. Gulati, N. Nohria and A. Zaheer , Strategic Networks, *Strategic Management Journal, A* 21, 203-215 (2000).
7. K. B. Clark and T. Fujimoto, Product Development Performance: Strategy, Organization, and Management in the World Automobile Industry (Harvard Business School Press, Boston, 1991)
8. J. H. Dyer and H. Singh, The Relational View: Cooperative Strategy and Sources of Inter-Organizational Competitive Advantage, *Academy of Management Review, A* 23(4), 660-679 (1998).
9. S. N. Wasti, and J.K. Liker, Collaborating with Suppliers in Product Development: A U.S. and Japan Comparative Study, *IEEE Transactions on Engineering Management, A* 46 (4), 444-46 (1999).

10. E. Von Hippel, The Sources of Innovation (Oxford University Press, London 1988).
11. H. Thomke and E. Von Hippel, Customers as Innovators: A New Way to Create Value (Harvard Business Review, 2002).
12. D. Teece, Managing Intellectual Capital (Oxford University Press, London, 2000)
13. S. Brown and J. Duguid, Organizational Learning and Communities of Practice: Toward a Unified View of Working, Learning and Innovation, *Organization Science*, *A*2 (1), 40-57 (1991).
14. E.C. Wenger and W.M. Snyder, Communities of Practice: The Organizational Frontier, *Harvard Business Review*, Jan-Feb, 139-145 (2000).
15. M. H, Zack, Developing a Knowledge Strategy, *California Management Review*, *A*41(3), Spring, 125-145 (1999).
16. R. Rothwell, Towards Fifth-Generation Process Innovation, International Marketing Review, 11(1), 7-31 (1994).
17. P. Gloor, Swarm Creativity – Competitive Advantage Through Collaborative Innovation Networks (Oxford University Press, 2006)
18. K. M. Eisenhardt, Building Theories from Case Study Research, *Academy of Management Review*, *A* 14 (4), 532-550 (1989).
19. M. Hansen, N. Nohria and T. Tierney, What's your Strategy for Managing Knowledge, Harvard business review, *A*77 (2), 106-116 (1999).
20. E. Wenger, R. McDermott, and W.M. Snyder, Cultivating Communities of Practice: A guide to Managing Knowledge (Harvard Business School Press, 2002).
21. D.R. Compeau and C.A. Higgins, Computer Self-Efficacy: Development of a Measure and Initial Test, *MIS Quarterly*, June (1994).
22. D.F. Davis, Perceived Usefulness, Perceived Ease of Use, and User Acceptance of Information Technology, *MIS Quarterly*, September (1989).
23. M. Granovetter, The Strength of Weak Ties: a Network Theory Revisited, *Sociology Theory*, *A*1, 201-233 (1989).