**The role of third parties in the software innovation processes**

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Competitive paper

**Introduction** :

The software industry is characterised by a regular flow of innovation, but also by a high failure rate which leads companies in this sector to reconsider a better integration of the first customers in the projects applying new concepts. Radical innovations are usually developed by start-ups that take part in a market-creation process and come up against resource scarcity in terms of time and manpower. In fact, the software industry is ruled by a phenomenon called "winner takes all" (Cusumano, 2004) : only a few pieces of software survive in each category. This means that software publishers have to focus on their technology to be among the leaders in the domain. In addition, they also have to combine their offer with software designed by other publishers so as to be able to offer attractive solutions to their customers. According to Cusumano (2004), the initial implementation of a new concept within the customer organisation represent a key stage in the innovation process, enabling the transition from the concept to the product. But at the same time, when it comes to more mature software applications, innovation generally comes from big software companies whose products already hold a strong position on the market and can be considered as a platform to which other software can be plugged. In both cases, we observe the existence of partnerships between software companies involved in innovation processes.

## 1. Literature review

### 1.1. Open innovation

The user innovation literature (Franke & von Hippel, 2003) and the open innovation literature (Chesbrough, 2003) generally cites the software, and especially open source software, as the emblematic example of successfull distributed innovation processes. Indeed, the software industry is distinguished by the dynamism of the open source movement that highlights individual developers that take part in software design (von Krogh & von Hippel, 2003). These developers are generally lead users (von Hippel, 1986) trying to fulfil their specific needs. The coordination between these developers is usually presented as emerging and self-organised (Raymond, 1999), contrary to the traditional methods of organising new product development as described in project management. But the distributed processes of innovation are not only related to open source software, since it can observed in the proprietary software field too (Scheid & Charue-Duboc, 2011), this resulting from the modular nature of software architecture. But, the literature mainly covers open source software and describes projects run by self-organised communities of volunteer developers. Logically, in this case, the organisation question is not central.

### 1.2. The role of *proximity* in the development of inter-firm cooperation

The question of the *proximity* between these innovation partners or these members of innovative communities is of interest since this (spatial) *proximity* is often presented as a key element in the achievement of innovation processes (e.g. the Silicon Valley). For a long time, the literature

emphasized the spatial anchorage of innovation. With the concept of industrial cluster (Anderson 1994; Porter 2000), some regions have been analysed as supporting a higher rate of innovation and a higher density of innovative firm. These localisation and agglomeration mechanisms have been studied in the economic and management literature elaborating on the concepts of industrial district (Panne 2004) or innovation systems (Freeman 1987). The degree and nature of innovativeness of such milieus are explained by externalities in a given cluster conceived as emerging from the relationships between the institutions of science (labs, research centers) and the industrial firms. The geographical *proximity* of firms within a cluster has thus been viewed as fostering social interaction, trust building, coordination and hence interactive learning and innovation (Boschma, 2005; De Witt et al., 2006). The material and immaterial externalities (Massard & Torre, 2004) generated by geographical *proximity* are seen as a key factor motivating firms to gather on a same territory (Massard & Torre, 2004). However, contrarily to some initial pre-suppositions, the spatial *proximity* of actors has been proved to be insufficient at generating cooperative projects and inter-organizational learning (Boschma, 2005).

Some industrial economists provide an analysis of the various forms of *proximity* that contribute to the emergence of an economic territory (Zimmerman 2008). The literature then started to highlight other forms of *proximity* essential to the success of innovation. Beyond spatial or geographical *proximity*, some authors (Rallet & Torre, 2005; Boschma, 2005) then make a distinction between:

- *Organized or organizational proximity* defined as the capacity offered by an organization to generate interaction among its members (Rallet & Torre, 2004). This dimension emphasizes relational or social *proximity*.
- *Institutional proximity* which emphasizes the role of the institutional framework at the macro-level: "*it is an enabling factor providing stable conditions for interactive learning to take place effectively*" (Boschma, 2005). It is based on common codes of conduct enabling to anticipate the behavior of actors.

More recently, Bouba-Olga and Grossetti (2008) integrate these concepts in a new typology based on latest development of sociological economy. Apart from spatial *proximity*, these authors refer to *socioeconomic proximity* and divide it into two sub-categories: 1) resource-based *proximity* leading to material or cognitive *proximity*, and 2) coordination *proximity* which includes relational *proximity* (i.e. the closeness of actors in the social network) and mediation *proximity* (when it relies on behavioral norms at the institutional dimension).

### 1.3. Characteristics of the relationship between the actors

The literature highlights that for cooperation and co-development to occur on a project, the parties have to develop trust, commitment and have a minimum of shared goals. Trust is presented by several authors as the most important factor for the creation and development of a fruitful collaboration (Ring Smith and Van de Ven, 1994 ; Gummesson, 1990, 1991) and a key ingredient to engage in a partnership (Boersma et al., 2003 ; Scott, 2001). Several authors have also highlighted the importance of commitment in the development of cooperative behaviours between parties (Håkansson and Snehota, 1995; Cheung et al., 2003). The notion of commitment expresses the desire of parties to develop the necessary resources, efforts and investments to develop a successful relationship (Grönroos, 2000; Moorman, Zaltman and Deshandé, 1992). The creation of a cooperative relationship between two parties relies on a minimum level of shared goals and expectations (Ring, Smith and Van de Ven, 1994 ; Bardram et al, 2005).

To conclude our literature review, we underline the fact that the open and user innovation literature describes software innovation processes led by self-organized communities without any third party playing an active role in it. The spatial *proximity* between the members of these innovative communities might seem a key element in the emergence of innovation but the latest works on *proximity* underline the importance of non-spatial *proximity*, but doesn't refer neither to third parties when it comes to organizing this "new kind" of *proximity*. But recent studies in the field (Scheid & Charue-Duboc, 2011; Goglio & Mazet-Crespin, 2011) have shown the decisive role played by third parties who took part to innovation processes.

This leads us to our research question: What is the role of third parties in the development of collaborative innovation between two suppliers in the field of proprietary software? How do they interfere in the process: at which stage of the cooperation, in which role and what is their impact on the partnership process ?

### 3.2. Research method

Given our research objective, a qualitative method based on case studies thus came across as most appropriate. It is adapted to analyse complex, social processes as it preserves chronological flows (Miles and Huberman, 1994) and thus take into account the various stages and the non linear process that characterise the cooperation process. Finally, it is adapted to exploratory research designs in the analysis of business exchanges (Yin 2003). We have decided to compare two cases leading to successful cooperation and innovation processes. Both cases involved innovation process between private firms in the software industry in France but with substantial differences in terms of company characteristics (small versus large firms) and environmental characteristics (within or outside a cluster). Data has been collected through 81 semi-structured personal interviews.

## 2. The case studies

The following case studies describes how two firms developed an innovative solution and the role of third parties in this process.

### 2.1 CASE 1 – ACTOS BETA

In September Year 1, the market manager of e-business solutions of Actos looks for an improved knowledge management system. Member of the Telecom Valley Association, he sends an e-mail to all its e-business managers. The association is a community of actors aiming at stimulating technological innovation and uses of information technology. Several managers answer including the manager of Beta who has developed a Content management system (CMS) for its customer websites. The next stage for Actos was to qualify the technical expertise and potential commitment of Beta. Firstly, the association helps Actos learn about the CMS system and qualify its technical validity by organizing a seminar: the e-business manager of Beta invites his counterpart in Actos to attend his presentation during this seminar. Afterwards, the two e-managers decides to organize meetings with their engineers to investigate cooperation opportunities. Thanks to those, Actos' engineers rapidly understand the benefits of the system. Beta also realizes that the cooperation with Actos could help them improve the applications of their software. Concerning the development of trust, the association played a key role. This trust found its roots both in the expertise of the association members and in the integrity of its members guaranteed by its principles of conduct and action. These principles take the form of best practices but can be considered as informal rules. The main learning mode is through exchange. Hence, the association encourages exchanges through the

organization of events and a reward mechanism (awards, challenges…) enabling them to review their members' performance and to influence their behaviors.

Soon, the engineers from both firms realize the need to combine their knowledge-base, to avoid the risk of developing the same functionalities. To deal with the problems of operational coordination, the companies decide to appoint a system administrator from Beta. This systems administrator was required to give the formal approval (validation of new functionalities) to the software. His role was to manage the relations between the engineers and to help the actors to follow the rules of the association. Through this, the actors were able to recognize other firms' complementary skills and to learn to trust each other.

### 2.2 CASE 2: Temis Mondeca.

The second project deals with the creation of a knowledge base for Exinis, a publishing house. Both IDE and ITM are innovative software, and their coupling enables the automatic indexation and storage of information. The Exinis France web manager has the idea of coupling Temis and Mondeca software to help tag the information and automate the editors' work. He asks the two software companies to cooperate, but at the start they refuse because they prefer to focus on their very technology. In addition, they have never worked together and there are six hundred kilometers between them. But he manages to convince them, by describing the potential applications of this new software, by demonstrating his skills both in the linguistic and the knowledge modeling fields and of course by sponsoring the project.

Various people at Exinis are involved in the project :

1. the web manager (or 'innovation architect') initiates the project and chooses Temis and Mondeca. He supervises the project and follows the work of the operational project manager.
2. operational project manager coordinates the tasks in close collaboration with Temis and Mondeca project managers

3. two expert-users, trained in knowledge management, worked continuously with the suppliers, the Temis project manager and the Mondeca project manager. Their support proves to be decisive in terms of the precise uses that editors would expect of the solution.

## 3. Analyze

In both cases, there are roles that have to be structured throughout the projects:

| The roles of key actors at each stage | CASE 1 - Actos Beta | CASE 2 |
|---|---|---|
| **Stage1**- need identification to cooperate | Actos | Exinis |
| **Stage2-** Screening and selection of potential | T.V. association helps Actos qualify potential development partners among its members | Exinis |

| | | |
|---|---|---|
| partners | | |
| **Stage3**-Technical and relational validation of the potential partner(s) => desire to pursue the cooperation with the partner | TV association helps develop a priori trust & willingness to cooperate. Key role of principles of conduct and action for members of T.V. association, i.e. informal rules (*mediation proximity*). | Exinis Innovation Architect manages to involve the two suppliers in a cooperation process in spite of their initial reluctance The suppliers trust the innovation architect of Exinis for his technical skills and its capacity to imagine new applications and to lead the project (*relational proximity*). |
| **Stage4**- Organisation and rules to efficiently manage the cooperation process and open innovation process | The system administrator helps the actors to understand and accept the rules of the association (*mediation proximity*) and to manage the relations between the engineers (*relational proximity*) | Exinis Innovation Architect defines the specifications of the project (*mediation proximity*) and Exinis operational project manager coordinates the work of the suppliers (*relational proximity*)<br>Each supplier progressively learns to deal with its partner's field of expertise (*cognitive proximity*). |
| **Stage5**- Going to market (market launch with first customers) | TV association helps to find the first key customer (*mediation and relational proximity*). | N/A since the first customer is at the origin of the project. |

The analyze of the two cases show the necessity to organize the *proximity* between the two suppliers. But there are several differences: in the first case it's a matter of *mediation proximity* and *relational proximity* and the TV association plays a key role in organizing them. On the other hand, in case2, *mediation* and *relational proximities* are required too but also *cognitive proximity*. This results from the fact that Temis and Mondeca are designing an innovation of exploration (March, 1991) : they don't know their partner's domain of expertise at the start and they don't know the precise applications of their future product: there are facing cognitive limitations that they have to overcome. And this *proximity*, as well as the two others, is organized by a lead user customer. In each case, the key actor organizing the different types of *proximity* that are required between the two suppliers can be identified as a *tertius jugens* (Obstfeld, 2005).

**4. Conclusion :**

The literature on clusters explains that the interorganisational cooperation emerges from spatial *proximity* whereas the open innovation literature on software generally describes cooperations that do not require any third party. On the contrary, the two cases we have studied show that the cooperation between software editors requires different types of *proximity* and that the organization of such *proximities* may be assumed by a *tertius iugens*.

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