Implementation of Open Innovation Model: Organizational Approach

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ABSTRACT

The proposed article aims to show which organizational supports contribute to successfully maintaining an open innovation model. Concretely, in this paper we set out a new approach to managing open innovation: i.e. identifying the organizational framework for integrating outside knowledge. To do this, we focus on organizational set-ups and stakeholders during the early phases of inbound open innovation. We analyze this question on the example of a major French group in the high-tech sector that has an active policy of inbound open innovation.

Key words: open innovation, organizational structure, innovation strategy

1. Introduction

In an environment of global competition based on new ideas, shorter product life cycles and market uncertainty, a company's capacity to innovate is viewed as a source of sustainable competitive advantage. In this context, the innovation model is evolving so as to adapt to the rapid diffusion of knowledge. Rothwell (1994) identifies five generations of innovation since Schumpeter's linear process, from the chains that link markets and inventions (Kline and Rosenberg, 1986) to extensive networking. In 2003, Chesbrough (2003) introduced the concept of open innovation – which offers an alternative to the closed innovation model centred on in-house research results that are very expensive and long to obtain – in the form of an open model based on both internal and external knowledge sources. Unlike the closed model, which assumes in-house Research and Development (R&D) and targets traditional markets, open innovation puts the emphasis on outside relationships to acquire and/or develop inventions. In other words, it involves a new paradigm for managing the innovation process that puts forward two complementary aspects (Chiaroni et al., 2010):

- Inbound open innovation, which is based on establishing relationships with external organizations or individuals with the purpose of accessing their technical and scientific competences for improving internal innovation performance; and
- Outbound open innovation, which is the practice of establishing relationships with external organizations with the purpose of commercially exploiting technological knowledge.

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This opening-up of the innovation process towards the outside involves intensive collaboration between holders of technologies in different institutions, departments and technological domains. For companies, the transition towards an open model takes the form of organizational changes that help to build up new innovation model (Charoni et al., 2010, Chesbrough, 2003; Deck, 2008). In particular, Christensen (2006, p.35) points out that, "Open innovation can be considered an organizational innovation". Despite the attention it has attracted, there are still unanswered questions regarding the open innovation paradigm and in particular the organizational structure for inbound activities. Current studies focus on theoretical analyses using single case studies, with a very general overview of the organizational structures in place for research collaboration on open innovation. Recent studies have shown the importance of organizational support in creating new partnerships to move towards a process of open innovation (Marshak, 1993; Chesbrough, 2006). A deeper understanding of organizational mechanisms is important for research and practice because it constitutes the foundation of theoretical research questions and provides helpful managerial recommendations for implementing open innovation. This article takes up this recognition of the role of organizational methods for successfully managing an open innovation model. Concretely, the issue is to show how a specific organizational framework contributes to the development of inbound open innovation on the case of a major French group with R&D activity in the High-tech sector.

The first part presents the framework of our analysis on organizational supports in an open innovation model. The second part focuses respectively on the methodology and the results of this research.

2. Organizational support for managing open innovation: literature review

The relationship between organizational structures and innovation has been the focus of numerous studies. The outcome of an innovation process is defined by the characteristics of the organizational structure, which have been recognized as critical (Drucker, 2007). In fact, the organizational structures adopted by firms influence the development and accomplishment of innovation (Menguc & Auh, 2009). As shown by Hansen & Nohria, (2004), effectively managing externally acquired knowledge requires the development of complementary internal organizational support focused on accessing and integrating the acquired knowledge into the firm's innovation processes. The development of organizational arrangements is crucial to successfully opening up an innovation process (Naqshbandi & Kaur 2011). In particular, an organizational structure is considered as the starting point for implementing open innovation (Chiaroni et al. 2010). However, apart from the work done by Chesbrough (2003), few studies focus on organizational structures for open innovation. In this section, we describe the reference framework that was used as a guide to gather and interpret the empirical data collected through the case study. This framework was developed by looking closely at organizational forms, in particular those that combine exploration and exploitation in the innovation processes (Ferrary, 2011) and into the rare research dedicated to the organizational characteristics of an open innovation model.

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Studies on innovation look at the structures that make it possible to combine two complementary approaches: exploitation innovation, which mobilizes existing knowledge in the company to rapidly respond to the market, and exploration innovation, which involves significant renewal of knowledge (Raisch & Birkinshaw, 2008; March 1991). A company is supposed to gain a sustainable competitive advantage through striking an efficient balance be exploration and exploitation (Andriopoulos & Lewis, 2009) and efficiently exploiting the disruptive innovations generated by exploration (Benner & Tushman, 2003; McNamara & Baden-Fuller, 1999; O'Reilly & Tushman, 2004). Indeed, in the case of an open innovation model, a company's goal is to combine exploitation and exploration. Research done by Ferrary (2011) shows that in open innovation, companies combine exploitation and exploration in ambidextrous structures. In order for exploration and exploitation to co-exist, these organizational forms possess highly specific characteristics (Chanal & Mothe, 2004):

- Organizational flexibility, which is the capacity to modify structures, decision-making circuits and communication in the face of change;
- Extensive communication, which offers actors a great deal of freedom to improvise within innovating projects;
- Creation of a scientific expertise network within the research centre targeting external cooperation to acquire and commercialize knowledge.

Beyond the problem of organizational ambidexterity, studies done by Chesbrough (2003) underline how modifications in organizational support allow the process to be opened towards the outside. In open innovation processes, organizational boundaries become porous and firms interact significantly with different actors in their environment (universities, research laboratories, customers, exhibitions, venture capital firms, etc.). This opening-out of the innovation process thus requires setting up organizational mechanisms that that encourage external collaboration. The principle organizational characteristics of this model can be identified in academic work:

- Top management plays a significant role in setting up organizational changes (Chiaroni et al., 2010); in the same vein, the cohesion and strategic alignment of the firm's various functions play a key role in establishing successful open innovation ;
- Specific structures and measures are created to promote and evaluate the opening-up of the innovation model (Chesbrough & Crowther, 2006);
- Independent "open innovation" business units are set up (Kirschbaum, 2005) with dedicated cross-functional teams (Huston & Sakkab, 2006) or independent R&D units devoted to research activities (Chiaroni et al. 2010);
- Organizational roles are defined, e.g., gatekeepers who manage the interface between the firm and its external environment (Tushman, 1997);
- Incentive systems are set up, which should include more open-oriented goals and metrics (Chesbrough, 2003);

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- A network of partners is put in place during the initial phases of the innovation process, encouraging the acquisition of external knowledge (Perkmann & Walsh, 2007);
- A firm-level inter-organizational network is established by leveraging R&D managers' personal social networks. These networks are mainly explorative to probe new areas of knowledge that are different from those that they traditionally master (Chiaroni et al. 2010);
- Formalized processes for evaluating external knowledge are put in place to complement the existing explorative network. In this evaluation process, an important role is played by the IP Office, which defines mechanisms for facilitating knowledge transfer and protecting companies from opportunistic behaviour (Chesbrough 2006).
- Coordinating and centralizing activities are also key to operating an open model. Chesbrough (2006) point out that multiple options exist to coordinate the two extremes of centralized and decentralized approaches.

Coordinating and centralizing activities are also key to operating an open model. Mortara and Minshall (2011) point out that multiple options exist to coordinate the two extremes of centralized and decentralized approaches. According to Tripak et al. (2006) the primary strength of centralized R&D is that it encourages risk-taking and long-term thinking, while decentralized R&D primarily encourages aligning projects and business needs and shortening the time to market. An alternative is a hybrid structure, which gives business units the capacity to handle incremental innovation for current products and may exceed the resources of a central R&D department, but with less efficiency than other structures. Research has not established whether an autonomous structure or a centralized structure is best suited to open innovation (Linton 2002).

Along the same lines, Charonie et al. (2010) highlight the importance of routines and procedures in adopting and succeeding open innovation. This involves establishing formal structures, defined as a form of control employed by bureaucratic organizations, or in other words, the degree to which a codified body of rules, procedures or behaviour prescriptions is developed to handle decisions and work processing (Naqshbandi and Kaur, 2011). Formally structured organizations are characterized by institutionalized rules, policies and routines, difficult cross-function integration, and reduced spontaneity and flexibility in operations, leading to behaviour programming and strict rule enforcement (Chen & Huang, 2007). In contrast, an informal organizational structure is characterized by openness in the system, which is a necessary precondition for initiating ideas in the innovation process (Naqshbandi and Kaur, 2011). According to Damanpour (1987), high formalization makes administrative innovation easier, while low formalization facilitates the adoption of technical innovations. Firms employ both formal and informal coordination. Nevertheless, Naqshbandi and Kaur (2011) show that published studies imply that open innovation tends to be favoured by informal, rather than formal, organizational structures.

In this first part, we have highlighted the contribution that published studies have made regarding organizational supports and organizational skills for the open innovation model.

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Despite the interest of these studies, some issues remain unanswered and have directly guided our research:

- Literature on organizing open innovation is centred on highlighting organizational characteristics in general. It gives us little information on actual organizational support, which, at a more aggregated level, takes into account internal and external players' effective involvement in managing open innovation, in particular during the early micro phases.
- Despite their variety, these organizational characteristics are never analyzed at each early micro phase of the inbound open innovation process.

3. Empirical study: Results, significance of management and policy

3.1. Methodology

As we have just shown, existing studies have done very little to develop issues regarding organizational set-ups linked to building an open innovation model, calling for a qualitative research based on a single case study. This research method seems particularly well suited to closely understanding a specific issue. The choice of a single case can be justified provided that it is "representative" or "typical" (Yin 2003). This research proposes a "qualitative case study" of a major French international group in the high-tech sector, which was studied for four years. The case was selected for its very dynamic R&D strategy based exclusively on an open innovation model. The results draw from an analysis of data collected since 2008. Semi-structured interviews were regularly held with the group's R&D and IP managers. The interview guide was produced by analyzing structural variables put forward in published works. Secondary data (internal and external documentation) also corroborated the information obtained through the interviews.

3.2. Results and discussion

Firstly, we set out the organizational support, the players and the tasks to be accomplished during each micro phase of the research done, which constitute the early stage of the open model (see figure 1). This is accomplished through constant, intensive collaboration with outside players selected for their field of expertise and taking the form of different kinds of partner: companies (SMEs or large enterprises), universities, customers and competitors. These organizational outfits exist and continue independently from the individuals that make them up. As part of an organizational framework, these systems possess internal stability and the capacity to evolve in order to accompany the opening-up of the innovation process. More precisely, an analysis of published work and our own case study highlight the following:

- Centralization and coordination of opening-out processes, with flexible hierarchical supervision and decision-making to implement them. This result confirms research by Mortara & Minshall (2011), which shows how open innovation activities have evolved towards a more flexible approach. The group studied has chosen to centralize strategic decisions on innovation, while guaranteeing flexible coordination through informal exchanges between vice-presidents of the families and technology department managers. Thanks to this flexible coordination, the group's strategy can be adequately implemented

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and continually fed by department's creative momentum, with support in terms of competences and additional funds.

- Formal and informal management facilitates the adoption of technical innovations. However, these two types of management co-exist in our organizational structure, but at different levels: formal management for the two decisive stages at the start of the process, when the decision is made to set up open research, and at the end of the open project, to decide on whether to develop the obtained results. Informal management tends to dominate within each phase.

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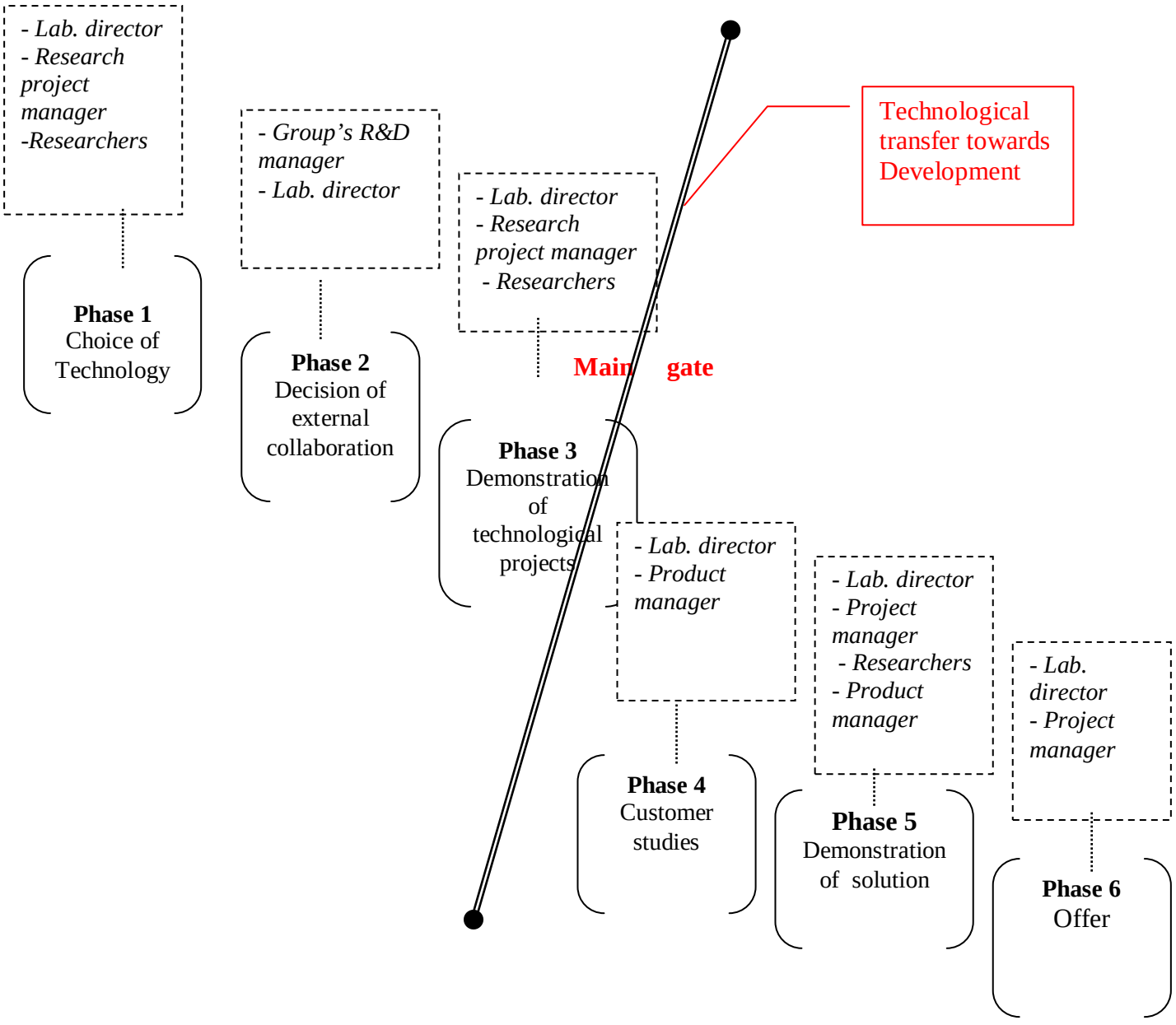
Fig 1. Early micro-phases in the open innovation process



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- The essential role of industrial property in implementing inbound open innovation. Strong patent protection affects a firm's opportunities to access technologies (Lhuillery & Pfister 2009). Patent protection facilitates the success of inbound open innovation because it helps to harness a firm's benefits. Therefore, IP is an important tool that creates a platform for technology transfer and for collaboration within open an innovation model. Hence, companies' involvement in open innovation may depend on the strength of IRP protection. In our case, protecting all technological results is a vital criterion in the decision to open up.

- Specific structure for managing external relations. A specific set-up is established within the department's laboratories focusing exclusively on external relations. This kind of central unit is set up in the most active laboratories and also supervises laboratories with few open projects. A manager of external partners directs this central unit supported by several managers. These managers are divided into types of partnership, such as with academic contacts, bilateral partnerships with companies, or multi-stakeholders taking part in European bids for tender. The managers oversee all activities involving the outside, which includes establishing a breakdown of major external stakeholders in the technical field, making external and internal contacts, and negotiating and concluding contracts. Once the framework agreement had been signed, the laboratory is responsible for implementing the open projects. The project manager supervises exchanges with the outside and the development of the various stages. Heads of open projects assure several different roles (e.g. agreements with academic partners, European projects, and several bilateral partnerships for all the laboratories in a technical department). This relies on a centralized structure with cross-cutting organizational flexibility that involves different internal stakeholders from several laboratories in the department depending on the characteristics of each project.

- Processes for carrying out and evaluating partnerships. The central unit focusing on open innovation manages open innovation projects by accomplishing several well-defined missions. Firstly, this involves listing open project propositions, analyzing how they fit in with general strategy, and validating the content of a project before it can be set up by the laboratory. Then, when the research activities are underway, the unit monitors its progress, and at the end of the project, verifies whether the expected results have been achieved. Managing open innovation projects therefore involves clearly defined stages and procedures for all of the technical departments and families:
  * Prior to the project, when deciding whether to implement open innovation, the procedure involves:
    - studying the interest of the project in strategic, technological and financial terms;
    - setting up a consortium with multiple partners (major companies, SMEs, universities and research centres, state organizations, etc.);
    - signing a standard framework agreement for calls for tender, or a specific bilateral project agreement.
  * A specific set-up comprising laboratory, project, strategy and technical development managers, is devoted to making an "open/or not" decision on the research project. This structure sets up formal procedures, known as "initial passage gates" to decide on whether to open an innovation project, to choose the type of collaboration and partners, and to sign the contract.

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* During the open innovation process (see figure 1), formal procedures are drawn up for each of the three activities: administrative (monitoring delivery of results at each micro-phase and spiral progress on stages), technical (monitoring technical parameters with the consortium members during meetings established in the agreement), and commercial (studying the client's social expectations).

- External partner networks: the group creates partner networks that participate in three types of project: projects with academic stakeholders, projects coming under European bids for tender involving several partners (e.g. institutions, companies, research centres), and bilateral collaborations with a special partner company. This network provides an opportunity to choose partners according to the project's importance for the group.
  Thus, the partner network offers several different development prospects: a bilateral framework agreement working towards a strategic framework agreement, or an international bid for tender working towards a specific bilateral project with one of the partners with which relations have developed. International open projects are an important lever for organizing relations between partners, overseeing financial and intellectual property issues, getting to know and learning to trust each other. They are a way of targeting future partners for bilateral open projects.

4. Contribution

Despite the representative character of the selected case, more specifically, this article extends previous research on several levels:
- Firstly, it sheds light on the organizational arrangements of open innovation by precisely describing the organizational support, stakeholders, and decisions at each phase of the open model in its inbound dimension. This research includes both organizational issues and skills-based issues by showing how they effectively interweave at the most aggregated level of links between external and internal stakeholders;
- Second, build up and develop organizational skills by creating multiple, open project structures. These skills require a long-term functional structure and occasional supports to encourage cooperation between external and internal stakeholders.

This exploratory research has the merit of laying the foundations of an initial reflection on the role of organizational support in building an open innovation model. This reflection appears all the more urgent given that contemporary studies contribute very little to the matter, despite the fact that over recent years companies have been putting increasing emphasis on managing knowledge in their open models and on modifying their organization in this direction.

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