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Open innovation models – a case study of playing poker with chess pieces[1]

Abstract

The benefits of employing open innovation models are widely acknowledged among academics and practitioners. However, the organizational challenges in employing open innovation models as opposed to more closed ones are not extensively explored in the literature. This paper addresses these organizational challenges. On the basis of an in-depth case study of a project within the Danish energy sector, two prominent approaches within the open innovation paradigm, user-driven and network-based innovation, are discussed. The analysis shows how the re-orientation from a closed to an open innovation mindset constitutes a significant managerial challenge. The paper identifies two overall barriers in the re-orientation: the ability to understand and the willingness to employ the open innovation approaches.

Keywords: open innovation, innovation management, network-based innovation, user-driven innovation.

Introduction

Managing innovation in today's open and uncertain markets is a matter of playing poker rather than chess (Chesbrough, 2004). The traditional, closed approach to managing innovation, illustrated by the metaphor of playing chess, is based on the ability of the individual company to plan several moves ahead, (close to) perfect information on your organization's resources for a given project now and in the future, and the fact that no new information would arrive during the project period. In contrast, the new way of carrying out innovation should be understood as a game of poker. Now the organization must adapt and adjust as new information regularly arrives, and the resources of both your own organization and your competitors emerge over time. In other words, most industries are characterized by an increasing level of complexity and dispersed sources of expertise, and in this context the locus of innovation is found in networks rather than in individual organizations (Powell, Koput & Smith-Doerr, 1996). Studies have shown that joining forces in a network potentially leads to a plus-sum situation for the involved organizations by making them able to meet the challenges of the business environment (Gulati, Nohria & Zaheer, 2000; Tidd 1995). The energy sector can be argued to be in a particular need of a collaborative approach in order to pool very different resources (Tidd, 1995).

Employing open innovation models often leads to a radical re-orientation for the organizations and to some extent implies fundamental changes in the mindsets of managers and employees of the organizations that have been using more closed innovation models (Birkinshaw, Bessant & Delbridge, 2007; Chesbrough, 2004). All innovation models require that the organizations are willing and able to implement the ideas behind the given model (Hansen, 1999). This challenge can be argued to be significantly greater when a re-orientation is needed. While the characteristics and positive effects of open innovation models have been analyzed rather thoroughly, the challenges of re-orienting the mindsets of managers and employees towards a more open and adaptive approach in relation to customers, users, competitors, suppliers etc. have received a more limited attention.

On the basis of an in-depth case study of a project within the Danish energy sector, the Smart Metering project, this paper seeks to answer the following research question:

What are the challenges that an organization faces when re-orienting its innovation approach towards a more open innovation approach?

1. Open innovation

Gulati & Kletter (2005) describe an overall tendency for organizations to open up in relation to the environment, by shrinking the core and expanding the periphery of their organization. The closed innovation model focuses on in-house expertise and how to manage physical and intellectual assets. On the other hand, the relationship-center organization is oriented towards managing relational assets, namely their customers, suppliers and alliances. A central aspect of doing business in this trend of shrinking core and expanding periphery is a re-orientation of the management of innovation (Gulati & Kletter, 2005). Two prevailing elements in this trend of open innovation, user-driven and network-based innovation will be presented in this section.

1.1. User-driven innovation. Von Hippel (1978) has presented a Customer-Active Paradigm (CAP) which is in contrast to the Manufacturer-Active

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Paradigm (MAP). MAP leaves the customer in the role of the respondent answering the manufacturer's questions, while CAP activates the customer (von Hippel, 1988). These paradigms can be considered as two extremes on a continuum, in which the MAP paradigm represents the chess metaphor while the CAP paradigm signifies the poker metaphor.

In the MAP, the manufacturer is responsible both for identifying ideas for a new product and for producing it. The idea enters a conform process handled by the R&D department and customers are only included in the late stages when the product is already developed. The customer plays the role as the respondent 'speaking only when spoken to' and the manufacturer selects a group of customers to survey and thereby obtains and analyzes information on needs for new product developments. This way of innovating is appealing to most companies and project managers as this reduces uncertainty and fuzziness in the innovation process.

In the CAP on the opposite side of the continuum, the customer is actively involved. The most well-known technique within the CAP is the Lead User method, which is appropriate in rapid changing environments (Urban & von Hippel, 1988). Von Hippel (1986) suggests adopting concepts and prototypes already developed by users who face needs that will become general in the market place in the future. This is a method, which is not merely useful in the later stages, but is useful throughout the entire innovation process since it provides input to the product specification, concept development and prototyping phases (Enkel, Perez-Freije & Gassmann, 2005).

Engaging in CAP methods like the Lead User method requires other activities than those suggested by the closed innovation model: investigation of analogous markets, customer active workshops and the identification of lead users through networking based searches (Kratzer & Lettl 2008; Lüthje & Herstatt, 2004). The outcomes of these activities are fundamentally different from customer related MAP activities as they are not used with the purpose of verifying or falsifying a hypothesis. The nature of the methods thus means that the outcome cannot and should not be foreseen or controlled, in contrast to the MAP.

1.2. Innovation in inter-organizational networks. As companies are shrinking their core and expanding their periphery (Gulati & Kletter, 2005) the locus of innovation and learning will to an increasing degree benefit from being carried out in inter-organizational networks (Powell, Koput & Smith-Doerr, 1996; Gulati, Nohria & Zaheer, 2000). Since the resources within the network organization are often widely dispersed, the network faces the challenge of managing the physical, intellectual and relational assets. Dhanaraj & Parkhe (2006) focus on this challenge and emphasize the issues of network stability, knowledge mobility and innovation appropriability. The ability of the focal organization to enhance the mobility of the knowledge within the network and, by this, lever competencies in the network is considered a key factor in inter-organizational networks. In other words involved organizations depend on their learning or absorptive capacity: their "ability to identify, assimilate, and exploit knowledge from the environment" (Cohen & Levinthal, 1989, p. 569). These perspectives on innovation in inter-organizational networks highlight the fact that intangible assets are key factors.

Since knowledge is supposed to be shared, the issue of innovation appropriability is vital. Some organizations are very focused on getting an equal share of the outcome of the network. However, too much concern about the outcome of the network tends to hinder free sharing of knowledge and can jeopardize the network as a whole (Dhanaraj & Parkhe, 2006). In a somewhat similar vein, an extensive amount of literature focuses on the importance of trust as the basis of the inter-organizational network (McEvily & Zaheer, 1999).

Flexibility can be seen as the *raison d'être* of networks as opposed to the more cumbersome and bureaucratic hierarchies (Provan & Kenis, 2008) and rigid contracts between organizations (Lorenzoni & Baden-Fuller, 1995). This flexibility is a prerequisite on both the operational and strategic levels (Moller & Halinen, 1999). Traditional strategic planning is not applicable in a network context. In order to utilize the windows of relational opportunities, Ritter (1999) argues that organizations have to develop networking competencies. A link between flexible and strategic networking competencies and an open corporate culture is furthermore emphasized in this study. Openness of corporate culture is defined as the degree, to which an organisation emphasizes flexibility, spontaneity and individuality as opposed to the control, regulation and stability of a hierarchy culture (Ritter, 1999). Thus, operating in an inter-organizational setting is by no means trivial for the organizations involved.

1.3. Sum-up of characteristics of open innovation models. The challenges confronting an organization, which is moving from intra-organizational to inter-organizational innovation models, are to a large extent similar to the challenges of moving from MAP to CAP. The inter-organizational/CAP set-up increases uncertainty in the innovation process

because the involved organizations do not exclusively coordinate and control the resources that are allocated to the project. They have to embrace the ambiguity and fuzziness of playing poker as opposed to the predictability and long-term planning of chess.

2. Research design

This section presents the Smart Metering case, the reason for selecting the Smart Metering project as a case, the data, on which the analysis is based, and the data analysis.

2.1. The Smart Metering project. The focal organization of the Smart Metering project is one of the major Danish IT companies (annual turnover of €400m and 2.800 employees). The energy division, which has been initiating the Smart Metering project, provides data processing software and ERP systems for a long list of Danish utility companies.

The idea about the Smart Metering project and the first outline of a potential business model within the area began in 2004, when the energy area director was inspired by the implementation of smart metering in private households and the industry. Smart metering entails access to new and more frequent information about utility consumption because the smart meters automatically report utility consumption on an hour-to-hour basis without active involvement of the customers.

The area director realized that the focal organization was not capable of developing smart metering products and services on its own. Hence, in 2005 it initiated an inter-organizational network with a view to develop new products, services and business models in the smart metering area. A substantial number of companies within the Danish energy sector were invited and accepted to participate in the network. In 2007, the network successfully applied for funding from a governmental program on user-driven innovation.

2.2. Case selection. The Smart Metering project was based on two prevalent open innovation approaches, network-based innovation and user-driven innovation. The inter-organizational network approach to innovation was the central idea at the genesis of the project and has been employed throughout the entire project period. The user-driven aspects of the innovation process were introduced at a later stage of the process.

The focal organization has a long tradition of employing a waterfall model (from requirement specifications to operations) when developing software for the customers (Royce, 1970). The organization is also working with an order-implementer project management system, which is based on a clear division between the persons that are ordering a given solution (often on the basis of a requirement specification formulated by a customer) and the implementer, who is developing the software solutions. The limited room for iterations of the waterfall model and the clear division between the persons, who are getting the input from external actors and the actual developers of the software, can be seen as an example of a rather closed and rigid approach to innovation.

Thus, the case study of the Smart Metering project can be presumed to shed light on some of the challenges and issues, which face organizations that wish to employ open innovation models instead of more closed innovation models and irreversible approach to project management. Since the study is exploratory, the aim is analytic generalizations rather than statistical generalizations (Yin, 1994).

2.3. Data. Various sources of data have been employed: Observations, interviews, background material and a questionnaire.

2.3.1. Observations. During the entire project period, two of the authors of this paper have been in continuous contact with the area director, the project managers and other employees of the focal organization. These interactions with the focal organization and the other participating organizations and observations during the project period have been documented through field notes.

2.3.2. Interviews. The authors have carried out fifteen in-depth interviews with persons from eleven of the organizations involved in the network. The first interviews were carried out in December 2006 (after the first three network meetings) and the last interview was carried out in July 2008. All interviews were recorded and transcribed. The interviews were set-up as semi-structured interviews based on an interview guide with some overall headlines.

2.3.3. Background material and archival records. The focal organization has given the researchers access to an extensive amount of background material and archival records. For instance, strategy plans behind the Smart Metering project and the energy division, vision paper on the outcome of the initiative, internal material on the envisaged role distribution of the various participants within the network, and financial accounts. Furthermore, several of the participating organizations have given access to market surveys, strategy documents, etc.

2.3.4. Questionnaire. A questionnaire was sent to the 32 persons that participated in the four network meetings – 31 persons answered the questionnaire. This questionnaire was aimed at

the participants' perception of the project and their view of the other participants in the network.

2.4. Data analysis. The data sources were coded in the QSR's NVivo 7 software (Bazeley, 2007). The coding was an iterative process, in which the coding of the sources was repeated in order to catch all the nodes.

The researchers that have been involved in the case have carried out an 'external' analysis of the generated data: Through triangulation (Jick, 1979) of field notes and other sources of data, they have sought to establish a common understanding of the development of the project.

As a part of the semi-structured interview guides, the interviewees were asked to describe their perspective on the project in terms of project set-up, management of the project, the role of the other participating organizations, aim of project, etc. The interview guide sought to avoid theoretical constructs that could lead the reflections of the interviewees in a given direction. Thus, terms like 'user-driven innovation' and 'network-based innovation' were avoided in order not to direct the responses.

During the coding of the sources in order to identify the open innovation constructs, some competing perceptions of the network and the Smart Metering project could be identified. The list of nodes, which could not be regarded as subordinated to the open innovation construct, could all be grouped within two additional constructs: closed innovation and branding/marketing. In other words, the data analysis employed a deduction/induction interplay (Kirk & Miller, 1986).

3. Analysis

Three overall approaches to the Smart Metering project are identified: 1) The open innovation approach (the user-driven and network-based approach), 2) The closed innovation approach (the MAP and intra-organizational approach), and 3) The branding/marketing approach. These approaches are presented in Table 1 to get an extensive overview of the results of the analysis.

Table 1. Respondents' perception of the project

Person/author	Organization	Source	Approach to project (number of references)		
			Open innovation	Closed innovation	Branding/marketing
Area director	Focal organization	Interview*	9	10	3
Project manager #1	Focal organization	Interview	10	1	3
Project manager #2	Focal organization	Interview*	0	19	5
Software developer	Focal organization	Interview	0	29	5
Area director	Focal organization	Vision paper	9	0	0
Software developer	Focal organization	Project homepage	0	8	0
Head of department	Utility 1	Interview*	32	0	0
Head of sales department	Utility 2	Interview	4	36	8
Head of customer service department	Utility 5	Interview	3	11	4
Product manager	Utility 6	Interview	0	12	2
Marketing director	Telecommunication company	Interview	0	16	1
Product manager	Electronic mail service developer	Interview	2	18	0
Head of development department	Designer of environmental goods	Interview	0	23	0
Experience designer	Designer of a/v goods	Interview	0	3	4
Marketing manager	Software development company	Interview	0	19	0

Note: * Have been interviewed twice. The number of references is a summation from the two interviews

3.1. Approach of the focal organization. The table clearly illustrates that the interviewees in general refer more to the closed than the open innovation models. The area director of the focal organization has a basic focus on open innovation models and their potential application to a smart metering context. In his vision paper he describes a project that is built on the principles of both network-based and user-driven innovation. During the Smart Metering project, however, the area director of the focal organization apparently had second thoughts
about the open innovation models in general and the network approach specifically. While in the vision paper for the project he explained how essential the network approach is to the project, his statement in the interview tends to moderate this perspective:

"You have to be aware that once you get concrete [about specific services and products] you do not want to have too many people around the table because then you easily become… then there is a tendency that it all vanishes in talk-talk and nothing".

Area director of focal organization (our translation from Danish).

The first project manager seemed to have understood the open innovation principles and was willing to actually implement them. He described some branding and marketing perspectives in the project but this did not seem to interfere with the overall open innovation approach. On the other hand, the second project manager of the focal organization (who was involved in the project in August 2006) depicts the project as a closed innovation project (cf. Table 1). In terms of an actual impact of users, he is rather doubtful:

"I think that it can become a bit pseudo, you know. A bit pseudo that we set up a project within the [publicly funded program] and that it is called user-driven innovation. How much impact it will have in the end… I do not know. Because, as I stated earlier, we have a fairly clear picture of what we want to have in the end".

Project manager #2 of focal organization (our translation from Danish)

The focal organization is seeking to separate the employees, who receive the input from customers and other external parties, and the employees, that are carrying out the implementation of these inputs into the software solutions. In addition, the focal organization has set up the development of the software as a water fall model, in which no iterations are possible. The software developer states that the functional requirements are known before the lead users were identified and that the Smart Metering project is all about implementing these functional requirements into the developed software.

After the second project manager was appointed to the project, the focal organization tended to spend a lot of time during the network meetings to discuss the potential of the Smart Metering project in terms of public relations, marketing and branding. The interviews indicate that this removed the focus of the network meetings away from the actual progress of the project towards the potential side-effects of being involved in a 'green project' that potentially can enhance the reputation of the involved organizations.

3.2. Approach of the other participating organizations. All the participating organisations in the network were involved in the Smart Metering project on the basis of an invitation to take part in an open innovation project. The invitation, which was prepared by the focal organization and the researchers that were participating in the project, emphasized the potential in developing business models within the smart metering area collectively.

However, the interviewees from the participating organizations (cf. Table 1), primarily use terms from the closed innovation models to depict the project. Pay-by-the-hour approaches, technology-driven and infrastructure-driven development, rigidity in project management, and concerns about sharing proprietary knowledge are prevalent among the interviewees. Some of the interviewees also perceive a branding and marketing perspective in the project while the open innovation elements are not prevailing in their description of the project.

Some of the interviewees state that they have understood the concepts of user-driven innovation. However, their understanding of the means of including the user preferences into the innovation model unveils a perception that is rather far from the ideas in CAP. They describe how the project should be based on questionnaires to a larger audience, that the output from the customers should be based on high validity, etc.

At a network meeting one of the participants in frustration over the long process of identifying and including lead users in the innovation process expressed the opinion that without the user involvement, the project partners could have developed a good and sufficient prototype before the next morning. The participant thought that the project was too oriented towards the needs of the customers. This perspective obviously contrasts with the basic ideas of user-driven innovation.

Only one organization appears to be able to describe the key components of open innovation and, furthermore, expresses the vision to actually implement these key components in the Smart Metering project:

"We have said that it is the customer, who is important. It is the customer who is central here. The customer is the starting point. It is the customer who should get something out of what we are doing. We know that later on the business will flourish".

Head of department at utility company 1 (our translation from Danish)

The same interviewee also describes how the user-driven innovation model contrasts with the traditional market survey approach because the latter does not have the ability to identify yet unperceived needs on the market. He thinks that the traditional market survey that is being done by a

competing Danish utility can be an interesting benchmark for the Smart Metering project because the approaches are so different.

The branding and marketing aspects of the Smart Metering project are a common aspect of the interviews with the participating organizations. A substantial number of the interviewees describe the project as a way of positioning their brand in general and their products and services to new and existing customers in particular.

Discussion and conclusions

An examination of the actual actions and perceptions of the participants in an open innovation project has constituted the framework for an investigation of the challenges that a re-orientation from a closed to an open innovation mindset entails. Any implementation of an innovation model, closed or open, can (cf. Hansen, 1999) fail either due to the involved actors not being able or willing to implement the model. In the present analysis the coding of the interviews illustrated in Table 1 is an attempt to illuminate the mindset of the project participants and how the open innovation project is perceived by them. Three constructs are highlighted: open innovation, closed innovation and branding/marketing. These constructs are not necessarily mutually exclusive, since the fact that an interviewee sees the project as part of a branding strategy does not necessarily mean that an open innovation project is discarded. Furthermore, to use a questionnaire does not necessarily indicate a lack of understanding or willingness to implement open innovation. Hence, information from quantitative surveys (like customer databases) can be very useful as a means for for instance identifying lead users (Lüthje & Herstatt, 2004).

However, practically all participants show a fundamental lack of understanding of the basic concepts of open innovation and the managerial implications of these concepts in terms of actual innovation management. Following Hansen (1999), the actors are unable to implement the open innovation model. This lack of understanding is not referring to specific and isolated practices and processes, but Table 1 illustrates how the overall mindset and focus of the participants are center on closed innovation and branding, rather than open innovation concepts. The main challenge of re-orienting from a closed to an open innovation model in this context is thus to move beyond the traditional chess-mindset, in order to be able to understand and focus on flexibility, adaptability and openness, which requires a more fuzzy and emergent approach (Chesbrough, 2004; Provan & Kenis, 2008; Birkinshaw, Bessant, & Delbridge, 2007). Basic concepts and knowledge about open innovation processes are simply not known to the bulk of participants and the focal organization ends up trying to play poker with chess pieces. This lack of understanding appears to be supplemented by a lack of willingness of the focal organization to apply the open innovation approaches. The focal organization depicts the open innovation elements of the Smart Metering project as pseudo elements since the project outcome was already defined prior to the user involvement.

The lingering question appears to be why the focal organization and the other participants in the network wish to be part of an open innovation project, which is not actually an open innovation project. The data indicates that the Smart Metering project could be seen as an example of organizational isomorphism, which implies the tendency of organizations to become increasingly similar (DiMaggio & Powell, 1983). Due to the positive experiences with open innovation models in large organizations like Xerox (Chesbrough 2004), Lego, Ericsson (Birkinshaw, Bessant, & Delbridge, 2007) and Starbucks (Gulati & Kletter, 2005), open innovation has become part of a narrative of doing business successfully. By adhering to the good stories of open innovation models, the participants in the Smart Metering project demonstrate that they are acting on purposes that are collectively perceived as progressive and future-oriented.

In terms of managerial implications, a given organization should be conscious about whether the participants in an open innovation project are able to understand the basic concepts and approach of open innovation. Such an understanding could potentially be strengthened collectively in the beginning of a project. In addition, the organization should ensure the willingness of the participants to actually implement this approach in the project. The initiating organization could set up workshops together with the other participants in the project in order to develop a common curriculum for the open innovation approach, which is employed in the project. This would help ensure some level of understanding and sense of ownership to the project.

The present study is aimed at analytical generalization. In terms of future research, the study could feasibly be supplemented by research designs with more statistical generalization perspectives. First of all, it would be interesting to analyze a larger sample of projects that are labelled as ‘open innovation’ in order to examine the actual content of the projects using the same coding approach as the present paper. Secondly, a large scale survey could enhance an examination of whether a re-orientation of mindsets to open innovation models is difficult to implement in real, business life.

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