# Central problems in managing open innovation: a recurrent issue?

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# INTRODUCTION

In 1986, Van de Ven pointed out four central problems in the management of innovation: the human problem of managing attention, the process problem of managing ideas into good currency, the structural problem of managing part-whole relationship, and the strategic problem of institutional leadership. Since then, the innovation landscape has changed significantly, characterized by the birth of multiple waves of new innovation management models such as corporate entrepreneurship (Burgelman, 1983), design thinking (Martin, 2009), and open innovation (Chesbrough, 2003). However, these problems seem to remain unsolved. This is shown by the fact that 20 years later, Van de Ven and Engleman (2004) still considered them as central in managing corporate entrepreneurship and innovation.

Among the new innovation management models, open innovation has developed from a small club of innovation practitioners, mostly active in high-tech industries, to a widely discussed and implemented innovation practice (Gassmann, Enkel and Chesbrough, 2010). A number of questions, then, are raised: does this new wave helps deal with the four problems identified by Van de Ven and does it create new problems? The purpose of our study is to provide answers to these questions.

Our field study is an open innovation program called Innovative Product Creation, of which the members include one business school, one engineering school, one school of design and a number of enterprises in France. The program conducts each year about ten to twelve independent projects. Each project consists of students from the three participating schools and participants from one firm, working on the development of an innovative idea during one year. The program has been going on since 2006, with new participating enterprises coming in and existing ones renewing their membership. This is a particular form of open innovation, since it involves students, faculties, and innovation professionals.

To find the answers for the above questions, we look at: 1) the adoption and implementation of this open innovation program by people in each participating enterprise, 2) the impact of the program on those people, who then engage in actions and influence their other innovation projects, their organizational processes, and the open innovation program itself, and 3) what happens to the program in the organization once the one year term has ended.

Our article is organized as follows. First, we review the literature on open innovation and the managerial problems of innovation presented by Van de Ven. Second, we present our case and our research method. Third, we discuss our findings. The paper ends with a conclusion.

# LITERATURE REVIEW

*Van de Ven's problems of managing innovation*

In 1986, Van de Ven pointed out four central problems in the management of innovation: the human problem of managing attention, the process problem of managing ideas into good currency, the structural problem of managing part-whole relationship, and the strategic problem of institutional leadership. These problems seem to remain unsolved, as 20 years later, Van de Ven and Engleman (2004) still considered them as central in managing corporate entrepreneurship and innovation.

First, there is the human problem of managing attention because people and their organizations are largely designed to focus on, harvest, and protect existing practices rather than pay attention to developing new ideas. The more successful an organization is the more difficult it is to trigger peoples' action thresholds to pay attention to new ideas, needs, and opportunities.

It is well established empirically that most individuals lack the capability and inclination to deal with complexity. Although there are great individual differences, most people have very short spans of attention-the average person can retain raw data in short-term memory for only a few seconds. Most individuals are also very efficient processors of routine tasks. A realistic view of innovation should begin with an appreciation of the physiological limitations of human beings to pay attention to non-routine issues, and their corresponding inertial forces in organizational life.

At the group and organizational levels, the problems of inertia, conformity, and incompatible preferences are added to the above physiological limitations of human beings in managing attention. Groups place strong conformity pressures on members, who collectively conform to one another without them knowing it.

The implication is that without the intervention of leadership (discussed below), structures and systems focus the attention of organizational members to routine, not innovative activities.

The second problem is managing ideas into good currency so that innovative ideas are implemented and institutionalized. While the invention or conception of innovative ideas may be an individual activity, innovation (inventing and implementing new ideas) is a collective achievement of pushing and riding those ideas into good currency.

Ideas are the rallying point around which collective action mobilizes-organizational structures emerge and are modified by these ideas. Moreover, it is the central focus on ideas that provides the vehicle for otherwise isolated, disconnected, or competitive individuals and stakeholders to come together and contribute their unique frames of reference to the innovation process. However, ideas are not potent to change policy unless they become an issue for political debate and unless they are used to gain influence and resources. The debate turns not only on the merits of the ideas, but also on who is using the ideas as vehicles to gain power. As the ideas are taken up by people who are or have become powerful, the ideas gain legitimacy and power to change institutions. After this, the ideas that win out are implemented and become institutionalized-they become part of the conceptual structure of the social system and appear obvious, in retrospect. However, the idea remains institutionalized for only as long as it continues to address critical problems and as long as the regime remains in power.

Third, there is the structural problem of managing part-whole relationships, which emerges from the proliferation of ideas, people and transactions as an innovation develops over time. A common characteristic of the innovation process is that multiple functions, resources, and disciplines are needed to transform an innovative idea into a concrete reality - so much so that individuals involved in individual transactions lose sight of the whole innovation effort. How does one put the whole into the parts?

Institutional leadership is particularly needed for organizational innovation, which represents key periods of development and transition when the organization is open to or forced to consider alternative ways of doing things. This responsibility is carried out through four key functions: defining the institution's mission, embodying purpose into the organization's structure and systems, defending the institution's integrity, and ordering internal conflict.

There is an important connection between transactions and organizations. Transactions are the micro elements of macro organizational arrangements. Just as the development of an innovation might be viewed as a bundle of proliferating transactions over time, so also, is there proliferation of functions and roles to manage this complex and interdependent bundle of transactions in the institution that houses the innovation.

Finally, the context of an innovation points to the strategic problem of institutional leadership. Innovations not only adapt to existing organizational and industrial arrangements, but they also transform the structure and practices of these environments. The strategic problem is one of creating an infrastructure that is conducive to innovation, and establishing organizational

strategy, structure, and systems that facilitate innovation. There is a growing recognition that innovation requires a special kind of supportive leadership. Institutional leadership is particularly needed for organizational innovation, which represents key periods of development and transition when the organization is open to or forced to consider alternative ways of doing things.

*Open innovation*

Gassmann, Enkel and Chesbrough (2010) observe that the open innovation phenomenon has developed from a small club of innovation practitioners, mostly active in high-tech industries, to a widely discussed and implemented innovation practice. Simultaneously, a small community of management researchers has recently developed into an established research field. This is reflected by several special issues on open innovation, for example, R&D Management 2006, 2009, and the International Journal of Technology Management 2010a, b. Consequently, single lectures by early proponents have been supplemented by large management seminars on open innovation, which are often fully booked.

Open innovation literature can be organized into nine different perspectives (Gassmann, Enkel and Chesbrough, 2010).

(1) The spatial perspective leads to research on the globalization of innovation. Since research, technology and product development have become more global in a flat world, open innovation has become easier.

(2) The structural perspective shows that work division has increased in innovation. There is a strong trend toward more R&D outsourcing and alliances (Hagedoorn and Duysters, 2002). Open innovation approaches compensate for central R&D units by not just focusing on short-term, customer-oriented business unit research activities.

(3) The user perspective. Users are integrated into the innovation process to utilize the freedom available in its early phases in order to understand potential customers' latent requirements and to integrate users' hidden application knowledge (von Hippel, 1986). This research field on innovation's downstream-side started with lead users' involvement in the innovation process (von Hippel, 1988), the availability of toolkits (von Hippel and Katz, 2002) and the idea of mass customization (Franke and Piller, 2003), while involving the

quasi-political concept of emocratizing the innovation process (von Hippel, 2005). User innovation is one of open innovation's best-researched part fields.

(4) The supplier perspective. The downstream side of innovation has been less intensively researched but has a strong impact on innovation. Suppliers' early integration into the innovation process can significantly increase innovation performance in most industries (Hagedoorn, 1993, 2002).

(5) The leveraging perspective. Most research and practice are oriented toward the existing market and business. Existing research competencies and intellectual property's multiplication into new market fields have often been neglected, despite their potential to create new revenue streams. The involvement of business model thinking seems to be crucial (Kim and Mauborgne, 2004; Chesbrough, 2006, 2007). Created technology and intellectual property's external commercialization is a future field with high potential.

(6) The process perspective. There are three core processes in opening up the innovation process: outside-in, inside-out and coupled (Gassmann and Enkel, 2004). Sometimes, these processes complement one another, although the dominance of the outside-in process is usually observed.

(7) The tool perspective. Opening up the innovation process requires a set of instruments. Those tools, for example, enable customers to create or configure their own product with tools kits or enable companies to integrate external problem solvers or idea creators via websites.

(8) The institutional perspective. Open innovation can be considered a private-collective innovation model. Instead of the private investment model of innovation with Schumpeter's temporary monopolistic profits, the free revealing of inventions, findings, discoveries and knowledge is a defining characteristic of the open innovation model (von Hippel and von Krogh, 2003, 2006). Spillovers of proprietary knowledge occur regularly by means of compensation
(e.g., licensing) or without compensation (e.g., most open source initiatives).

(9) The cultural perspective. Opening up the innovation process starts with a mindset. The seminal work on the not-invented-here syndrome by Katz and Allen (1982) was a starting

point within the field. Creating a culture that values outside competence and know-how is crucial for open innovation practice. This culture is influenced by many factors: besides being influenced by the values of the company, it is also influenced by concrete artefacts such as incentive systems, management information systems, communication platforms, project decision criteria, supplier evaluation lists and its handling and so on. In order to better understand the influence of all those aspects on the open innovation culture, research should draw more from the psychological field.

One current issue of open innovation literature is the trade-off between the benefits and the costs of open innovation. Openness can stimulate innovation by combining the efforts of a large and diverse pool of complementary firms, leading to increased product diversity and better matching of products and consumer preferences. It, however, increases coordination costs because it requires the cooperation of multiple suppliers and/or complementors (Almirall and Casadesus-Masanell, 2010).

Although the era of open innovation has begun for many firms, we still lack a clear understanding of the mechanisms, inside and outside of the organization, when and how to fully profit from the concept (Enkel, Gassmann and Chesbrough, 2009). To address this issue, it is important to know which competencies open innovation professionals need for working in open innovation teams and to cope with open innovation professionals working in a company (Chatenier et. al., 2010), to investigate why open innovation is adopted in a specific industry (Chiaroni, Chiesa, and Frattini, 2009), to be aware of the managerial challenges in open innovation (Sieg, Wallin, and von Krogh, 2010).

## OUR CASE: INNOVATIVE PRODUCT CREATION

Innovative Product Creation (CPI) is a joint program involving an Engineering School (CENTRALE PARIS), a Business School (ESSEC BUSINESS SCHOOL) and a Design School (STRATE COLLEGE). It combines student teams working during 9 months to give birth to innovative products or services. The subjects of enquiry are provided by company partners of the program.

The CPI approach relies on three main foundations:

1. Tackle innovation with the «360°approach»
- Design (ergonomics, usage…), Engineering (use «state of the art» technologies to innovate, material, IT, SCM etc.), Business (Marketing, financing, business plan….)

2. Foster creativity through «Open Business Design» approach
- Open Innovation : innovate outside of the usual inner circles
- Design thinking: put the Design at the core of innovation
- Business : Innovation are meant to be marketed, not «just for fun»

3. Mix theory and real projects
- Students have 100 hours of classes about each dimension of innovation
- They apply theory to their own CPI project
- With a strong live support from tutors, experts, partners of the program on their issues

The CPI process is organised in three distinct stages:

1. Imagine

The first stage allows the student teams to explore the field of innovation and to suggest creative directions. They have to observe the usage experiences and to go beyond the apparent "reality". By scrutinizing the environment of their innovation subject they come with new usage scenarios which are the template of their innovative solutions.

2. Visualize

At this stage, the teams integrate the technical, the economical and the ergonomic constrains to their innovative ideas. Thus they can strengthen their innovative concept. They have then to visualize them by building stories around their concept and making video clip that illustrate their innovative solution.

3. Realize

At this last stage, the teams finalize their achievement in order to transfer it to the appropriate unit within the company. The students are aware that the innovation process contains many loops and iterative steps, and that the CPI program is only one of these loops. Hence the main objective is to convince the inner clients in the company to insure the implementation and the "nidation" of their innovative concept in the companies processes.

**FINDINGS**

For this study, we collect data from the following sources:

- An exploratory study (4 interviews) on the impact of the program on the companies participating in 2007 and 2008
- 12 in-depth interviews with companies participating in 2009
- 6 in-depth interviews with the professors supervising the independent projects and their meeting minutes
- Participation-observation in the collaboration process by two supervising professors

The data analysis for this study is still in process for the time being. We plan to accomplish it by the time of the conference.

Below is a summary of our preliminary analysis.

| Company | Decision to participate | Aims | Benefits | Specificities | Outcomes |
|---|---|---|---|---|---|
| Mobile Co | - Development Team in charge of citizenship pilot studies (marketing background)<br>- loose framing | - Find out what is possible and relevant to do within the robotics area<br>- Collaborate with multidisciplinary teams of students<br>- Find out more about design and methods | - broad view of the topics, key issues, good field and techno analysis<br>- reinforce the previous diagnostic that is was too early for domestic robots at low cost<br>- technology not available at reasonable price (200 euro) by the end of the year | - Lots of changes of interlocutors during the year both in the company and in the student teams<br>- one key team member (older, ambidextrous) | - The company decided to ask the student for a 'cahier des charges' rather than a rough prototype to encapsulate the concept of a domestic robot that was put forward by the students<br>- learn more about design and its value for the company (user oriented), decide to hire a designer on an internship in the Development team, decide to collaborate with another school of design (looking for new concepts and creativity<br>- keep in touch with the programme<br>- the short movie presenting the project was shown inside the company<br>- no follow up due to conclusion on technology lack of maturity |
| Telco Co | - Entertainment team within R&D department | - design added value service to enhance use of video contents by final users | - creativity session lead to change of focus from BtoC to BtoB with medical houses (more ethical business)<br>- ethnographic need finding and field work brought key insights<br>- compared to usual<br>- find out that videos content are difficult to use to design services (respect de l'intégrité des oeuvres | - one key team member leading the group / provide contacts with business partners | - extremely short time of validation of the idea internally (two days)<br>- follow up was difficult to realize<br>- change of internal client : from entertainment to healthcare department<br>- impossible to overcome R&D and marketing lack of dialogue (R&D not supposed to do marketing but willing to)<br>- set up new relationships within the company and outside (INA)<br>- the project will get into the usual go / no go process of ideas selection and development within the R&D department |
| Mail Co | - Operation department, within the team in charge of international benchmarking | - define the functionalities of the postman PDA | - change of focus : turn away from an internal process optimization view to a more | - A student from the business school was hired | - Experimentation in progress, will provide data to assess rentability by end of august 2011 |

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| | and new projects | - a local center asked for the service (experimentation was then possible) - work with students, fresh view | user oriented view (demand of real time information from the customers) - define a service that cross organizational boundaries between business units | for a two year internship in the company to follow the project and the development of the innovation | - Technological surprises occurred during the experimentation that has not been pointed out neither by the student team nor by the company in charge of the experimentation - Implementation of a similar project was done in another BU (validate the idea a posteriori) |
| Mail Co | - innovation department | - redefine direct marketing offer | -help people to focus on the project - lot of energy brought in while working with young people - employees used to work on their own become in charge of a team (of students) and experiment management without hierarchical position - open / close some ways of reasoning about direct marketing | | - project still going on - some ideas get legitimacy in the process (tag2D) - the short movie presenting the project was shown multiple times inside the company |
| Chip Co | The money comes from the HR department (higher education sponsorship) The idea comes from an internal innovation contest | - develop a business plan for an innovative idea developed by a intrapreneur | - help design a business proposal with a major retailer - business case was not strong enough, not enough revenues to convince the company | | - the project was presented at the American HQ (using the student short video, presentation and report) - the company decide to stop service diversification policy and to focus on hardware core business |

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