

Managing Online Users in Open Innovation The Case of a Nordic Telecom Company

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Abstract: The purpose of the paper is to report a case study of management challenges and appropriate management competences when implementing an online user innovation tool. The case study illustrates a theoretically derived framework of the management competences related to online innovation tools. The case study and the framework identify three main types of management competences and related practices: a) disclosure competence in order to find, direct and motivate users to contribute, b) appropriation competence in order to capture users' contributions and c) integration competence in order to direct, transfer and assimilate user contributions in an organization. The case study provides a managerially relevant view of the interaction between external sourcing of knowledge and necessary internal management competences to successfully involve users through an online innovation tool.

Key words: open innovation, user, online tools, management competences, case study.

Open innovation concerns practices where firms commercialize external and internal ideas by deploying outside and inside pathways to the market (CHESBROUGH, 2003; CHESBROUGH, VANHAVERBEKE & WEST, 2006). Some of the most valuable external knowledge sources for innovation are users and customers (VON HIPPEL, 1986; VON HIPPEL *et al.*, 2011). Innovation by users has proved to be common in many different industries such as automobiles (FRANZ, 2005), mountain biking (LÜTHJE, HERSTATT & VON HIPPEL, 2005), stereo components (LANGLOIS & ROBERTSON, 1992), juvenile products (SHAH & TRIPSAS, 2007), retail banking (OLIVEIRA & VON HIPPEL, 2011), and social services (SVENSSON & BENGTTSSON, 2010). Online innovation tools is an open innovation mechanism that is used to involve users and customers in generation of ideas, sharing experiences, testing products or designing products themselves (GANGI, WASKO & HOOKER, 2010; PRANDELLI, VERONA, & RACCAGNI, 2006). Empowering users with design expertise, tools and technologies may however challenge company's existing management competences (PRAHALAD & RAMASWAMY, 2004).

The issues of changing and modifying management competences and organizational culture in relation to open innovation practices have been recognized (DODGSON *et al.*, 2006; PRAHALAD & RAMASWAMY, 2004; DI MININ *et al.*, 2010; MORTARA & MINSHALL, 2011). However, research on open innovation mostly takes an outside-in perspective rather than an inside-out or a management perspective (ENKEL *et al.*, 2009; GASSMANN *et al.*, 2010). Thus, our explorative research intends to shed light on management competences and practices when implementing online innovation tools.

Our research finds that managers face three major types of challenges when implementing online innovation tools for involving users in a company's innovation processes. The challenges are (1) finding and motivating users, (2) appropriating user's contributions and (3) integrating user's contributions. These challenges demand the development of three management competences constituting an absorptive capacity for efficiently implementing online user innovation. First, disclosure competence needs to be developed in order to find, direct and intrinsically motivate users to contribute. The disclosure competence includes practices such as feedback on users' contributions, recognition of users' contributions, organization of contests and events, motivation of expert users, and revelation of the interface which new products and services should fit into. Second, appropriation competence needs to be developed in order to extrinsically motivate users and appropriate users' contributions. The appropriation competence includes practices such as organization and upkeep of transparent compensation schemes for contributors, a feedback system to contributors and a system of extrinsic rewards for contributions. Third, integration competence is needed to direct, transfer and fit in user contributions to a relevant portfolio of products and parts of the organization. The integration competence includes practices such as a professional ranking of user ideas, regular meetings with business unit managers, business unit inputs to the web innovation tools and a feedback to users by liaison managers.

■ The purpose and method

The purpose of the paper is to report a case study of management challenges and appropriate management competences when implementing a user innovation tool. The case study will be used to illustrate a theoretically

derived framework of management competences related to online innovation tools. The framework identifies relevant variables and questions that are tailored to a particular industry, a company and/or management issues (cf. PORTER, 1991). It intends therefore to inform research as well as practice. This study will inform research on management and implementation of open innovation and online innovation tools which are areas in need of further research (GASSMANN *et al.*, 2010).

We have performed a case study of a major Nordic telecom operator company that has decided to accelerate its innovation processes and more efficiently introduce new mobile services into the market. One of its strategic actions in this regard was to design a web-site, an online innovation tool that was called "InnovationWorld" (IW). The web-site intended to involve mobile phone users and independent software developers in sharing ideas for new mobile phone services, sharing experiences of existing services, and testing beta-versions of new mobile services. Moreover, the IW web-site disclosed APIs (Application Programming Interfaces) which enabled independent developers to develop mobile services software. The IW was in operation between August 2008 and December 2009. It was then closed down by the company. The directors of the company concluded that the IW-project had been very valuable in getting experience of management practices in relation to open and user innovation. However, other actors in the industry had successfully launched and developed more efficient online innovation tools and platforms such as AppStore and Android Market.

The choice to study a Nordic telecom company and its online innovation tool was not based on the principle of representativity. The case was rather selected on the criteria of innovativeness, results, and the availability of access to high-quality primary data. We consider the case to be innovative as it gave a possibility to study three types of online innovation tools: a tool to extract ideas from users, a tool to test and review prototype services by users and, finally, a tool to develop entirely new services by users. In most other cases, using an online innovation tool entails only its first type, in particular, using a suggestion and complaint function on a company's website (GANGI *et al.*, 2010; PRANDELLI *et al.*, 2006; SAHWNEY, VERONA & PRANDELLI, 2005). Moreover, the IW web-site resulted in product innovations for the company, thus, it was a functioning online innovation tool. Finally, we secured access to relevant managers and interviewed them at four different occasions following the development of the innovation tool over time. We studied the web-site and the three innovation tools for a 15 month period from its founding in August 2008 until October 2009. We gathered both real-time data and retrospective data. The real-time

data increases the data's validity (EISENHARDT, 1989; YIN, 1994; GARUD & van de VEN, 2002). Information and evidence from studying the web-site and interviewing the managers were used to cover events in real time, cover these events' contexts, and develop insights into managerial behaviour (YIN, 1994). Interviews with three managers were completed. First, we interviewed the R&D-director of the whole telecom company who initiated and oversaw the IW-project. Second, we interviewed the IW-manager who was in charge of the IW-project for its whole duration and who reported to the R&D-director. Third, we interviewed the IW idea manager who was in charge of the idea innovation tool and reported to the IW-manager. The access to the IW-case was granted on the condition that the company could remain anonymous when the study was reported. Thus, we are not able to reveal the name of the company.

■ User innovation and online innovation tools

The advent of web 2.0 and user innovation has increased interest in online innovation tools, (PRANDELLI *et al.*, 2006; SAHWNEY, VERONA & PRANDELLI, 2005). PRANDELLI *et al.* (2006) identified 28 online methods used by companies in the automotive, motorcycle, consumer electronics, food and beverages, and toiletries industries for interacting with customers and users. The research on online innovation tools broadly categorizes them according to their particular role in the innovation process (DODGSON *et al.*, 2006; PRANDELLI *et al.*, 2006). The first category of tools concerns searching and idea generation. User information is exploited through the exploration of user problems, needs and solutions. Traditional tools in this area are customer surveys, sales data analyses and sales personnel surveys which online innovation tools may complement or replace. Online innovation tools have the advantage of being interactive both in relation to users and company's managers (FULLER & MUHLBACHER, 2009). The second category is prototyping and product/service design innovation tools, sometimes known as user toolkits (VON HIPPEL & KATZ, 2002). They enable deep integration of users in innovation (NORMANN & RAMIREZ, 1993; VON HIPPEL, 2005). A company that employs such tools could empower its users to co-design a solution or implement methodologies to transfer an innovative solution from the user into the company's domain. An example of the latter is so called APIs (Application Programming Interfaces) that enable independent software developers to develop software programs for companies in their information systems. The third category of innovation

tools is product or concept testing and simulation (DODGSON *et al.*, 2006). Users can react to proposed solutions and concepts displayed by means of such online innovation tools. Improved multimedia capabilities engage customers in realistic and appealing simulations and product and concept testing using focus groups, pilot or beta users.

To effectively source external knowledge, complementary internal knowledge of the firm, an absorptive capacity, in the form of internal R&D and innovation related management competences are needed (CASSIMAN & VEUGELERS, 2006; COHEN & LEVINTHAL, 1990). Online innovation activities need to be maintained, developed or acquired by certain appropriate managerial competences (cf. CASSIMAN & VEUGELERS, 2006). Some conceptual studies (VARGO & LUSCH, 2004; THOMKE & VON HIPPEL, 2002) discuss managerial challenges of an open innovation strategy in general and note the need of a shift in management practices and organizational culture. However, few studies do empirically assess managerial challenges related to open and user innovation strategies and practices (GASSMANN *et al.*, 2010; SAWHNEY *et al.*, 2005; GREER & LEI, 2011). DODGSON *et al.* (2006) in the case study of Procter and Gamble using an open innovation strategy found that the company struggles with developing technologies in data mining and searching, simulation and modeling and virtual prototyping. Other exceptions are the case studies reported by SAWHNEY *et al.* (2005) of Ducati and Eli Lilly. They focus on cultural and organizational challenges experienced by the companies. The authors warrant more detailed research concerning management processes and practices in relation to online innovation tools.

PILLER & IHL (2009) identified in a conceptual paper three types of management competences that are needed to manage open innovation practices. They describe the competences as a process building on the concept of absorptive capacity, i.e. an organization's capacity and processes to absorb external knowledge that is formed by four processes of acquisition, assimilation, transformation and exploitation (ZAHRA & GEORGE, 2002; FLATTEN, ENGELEN, ZAHRA & BRETTEL, 2011; GEBAUER, WORCH & TRUFFER, 2012). The three competences that are identified by Piller & Ihl generally build on the research of absorptive capacity but are specifically designed for the context of collaborating with customers in open innovation settings.

Using a perspective of the problem solving process, PILLER & IHL (2009) identify the need of (1) disclosure competence in order to be able to disclose a company's problems and establish an interaction with users,

(2) appropriation competence in order to have an ability to capture and protect user generated knowledge, and 3) assimilation competence to have an ability to assimilate and integrate user generated knowledge into a company's innovation process and organization.

In many companies these three competences might be underdeveloped. First, many companies have a history of more or less closed innovation practices, i.e. relying on internal generation and development of new products, services and processes. Second, the recent development of online innovation tools and web 2.0 makes many managers unaware and/or skeptical of these tools and corresponding practices. Third, many managers may perceive getting ideas from users as inferior compared to getting ideas from internal experts. Fourth, many companies have established procedures for acquiring knowledge from outside consultants but have no procedures for acquiring knowledge from users or from online innovation tools.

Summarizing the brief review of research on open innovation and online innovation tools, we identified a preliminary framework that categorizes three types of online innovation tools: (1) searching and idea generation, (2) development and prototyping, and (3) simulation and testing. Moreover, building on PILLER & IHL's (2009) management competences, we categorize three types of management competences to efficiently implement and use online innovation tools: (1) disclosure competence, (2) appropriation competence, and (3) integration competence.

■ The case study of InnovationWorld

InnovationWorld (IW) was launched in August 2008 on the initiative from the central R&D-unit in the Nordic telecom company. The Nordic telecom company operates one of the largest mobile phone networks in the Nordic region and also a few other countries in other parts of Europe. The aim of IW was to get closer to users and customers and to accelerate innovation in mobile services. The IW-initiative and other initiatives to speed up innovation in the company was a response to the perception of slow and inflexible internal processes in an industry which was developing very rapidly.

"Our development work and test procedures tend to take a long time. We have a safety culture here which demands thorough testing of new products and processes. We need to speed up." (Interview the R&D-director)

"We had for a while been observing open innovation initiatives made by companies outside our industry, such as Dell IdeaStorm, but also in our industry, such as Vodafone Betavine. We decided to do something similar and call it Innovation World." (Interview the IW-manager)

The IW-project formed an own unit within the corporate R&D-unit. The IW-unit was represented through the IW-manager in the top management team of the R&D-function. The unit had seven employees which managed daily operations of the web site and internal communications. Some employees, among them an idea manager, gave information and feedback (official) to user suggestions and discussions and also posted company information on the web site. For instance, information about new technologies, new services and general information about the industry was provided.

The IW web-site had three user zones. The first zone intended to display and stimulate user ideas, comments and dialogues. In this zone, all mobile phone users, customers to the telecom company or not, could post ideas, discuss and react to ideas. It could be totally new ideas or ideas related to existing services. Users had to register to be able to post and discuss ideas. This registration gave users access to two other zones. The second zone was a beta version and trial zone where the company itself or, which was most often the case, independent service developers could launch beta versions of services such as new games or other new services. Users could then try these new services for free. Users were expected to write reviews and comments about services, suggest changes and improvements of services. The developer of the beta version could then see reactions to a service, get information about bugs and malfunctions, and get new ideas for changes and improvements. The IW-team could get information about the likelihood of a successful future launch of a new improved version of the service that could be integrated into the company's portfolio of mobile services offered to their customers. While the second zone was mostly for testing of internally developed services or services developed by independent professional software developer firms, the third zone targeted very small firms or independent software developers, such as students studying or being skilled in software development. In the third zone developers could get information and support about APIs and other relevant information. The third zone was used for software competitions that were usually targeted towards university students. Competitions could have a price sum of 5000 Euros for the best new mobile service. To attract students

to the competitions, the IW-team performed activities at different universities and also advertised on Google search.

To attract independent software developing companies to use the beta version and trial zone, the IW-team contacted these types of companies. They started with companies they already had a business relation with and then continued to invite companies which the IW team had not been working with before. Some of the smaller companies were suspicious that the large telecom company would try to "steal their ideas". As a response, the IW-team developed standardized contracts regulating intellectual property rights of the software companies when test-launching a mobile service on the IW-site as well as specifying the process for licensing the mobile service if the software company and the IW-team wish to do so. To develop the process of licensing and transferring third-party developed software, the IW-unit used roughly the same process and type of contracts as the telecom company had used when acquiring software development from larger software development firms.

"We have always worked with large companies in development work, like Ericsson and others. But we want to increase our contacts with small development companies and with users. We think the smaller development companies and users are more creative and faster to work with." (Interview the R&D-director)

In early September 2009 the IW-team decided to redesign the web-site. The IW-team found that they had to stimulate the discussion much more by providing more content to the users otherwise discussions soon would die out. Moreover, some users were highly knowledgeable about certain areas in the telecom industry. These expert users thus preferred to have discussions with other experts in the telecom company or other expert users. In response, the IW-team added much more content and divided idea generation and discussion activities into user expert groups on issues like future network technologies, the digital home, design of interfaces etc.

"We have had too low activity in the idea zone and too many low quality ideas. We have discovered that we need to comment and challenge our best contributors, divide them in expert groups for different issues and feed them with some of our expert knowledge. Then we got better quality ideas." (Interview the Idea manager)

In order to further attract attention to the web-site, the IW-team launched another competition for independent developers on the best software application for mobile networks. Some 160 developers showed interest. In

the end, 11 software services were completed and took part in the competition.

"Competitions are really great to attract attention, get something done in a limited time, and create a sense of excitement and enjoyment among the developers. It is not only about the prize money, it is how they trigger each other. It is also important for them to show that you can solve a complex problem in a limited time. And it's a very good marketing of our site." (Interview the IW-manager)

In October 2009 the IW had about 3000 members, a growth of 50% in a year (from about 2000 members in October 2008). The web site had an average of 300 unique visitors per day. About 5 % (10-15) of these take part in some activity per day. While this was a relatively small number of active members, the IW-team was keen on keeping contact with a core of knowledgeable and very interested users, users which they called lead users. To motivate this type of users the IW-team had to respond to their ideas and provide them with new interesting material from experts inside the company. Internal experts were invited by the IW-team to give their views on specific topics on the web-site. This resulted in more directed discussions and ideas as well as tests of new concepts.

In order to recognize the most active contributors, ten of them were titled "ambassadors" and were given special privileges. They received recognition on the web-site, got gifts in the form of mobile appliances and received access to new beta versions earlier than other users. In return they were expected to perform more thorough tests of mobile services, write reviews, comment and vote on other users' contributions and provide their own suggestions. Apart from the ambassadors, special recognition was also given to winners of contests and runner-ups.

Interesting user ideas, user developed software applications and favorable reviews on beta tested mobile services had to be transferred to the company's sales and R&D-units for further development. Regular meetings were set up to handle the transfer discussions with different sales and R&D-units. After a while, these units appointed special liaison managers that had regular contacts with the IW-team. After a few successful transfers, the liaison managers started to become pro-active and ask for ideas, concepts or prototypes in certain areas where they thought there would be demand. To facilitate the development of ideas, concepts and prototypes in certain areas, the units started to provide background material and links to post on the web-site. This was intended to direct and stimulate the flow of ideas and comments by users.

"Good ideas and user developed software applications need to be developed further. We do not have any resources to do the development. We need to transfer them to development units in our company or use outside consultants to do the work. For the internal transfer we have now regular meetings and appointed specific persons at other development and sales units to make the transfer smoother."
(Interview the IW-manager)

■ Disclosure challenges and disclosure competence – to find and motivate users

The first challenges encountered by the IW-team when launching the web site were to find and attract users to the web site. As advertising on Google, university activities and word-of-mouth slowly created more traffic to the web-site, user discussions tended to die out very quickly. The IW-team had not recognized the importance of regular feedback. Users wanted the IW-team to come with reactions, provide more material, give links to other web-sites and give the company's official view on different subjects. The IW-team soon learned to design a feedback system and a system to direct users' interest and creativity providing them with a regular response and new material to keep discussions and suggestions alive. To attract new users, the IW-team also tried to launch idea contests and motivate users with smaller rewards such as movie tickets, coupons for ice cream etc. to come up with ideas and concepts. Another management practice to attract and motivate especially very active and knowledgeable users was to create a recognition rank, so called ambassadors. The IW-team learned that this type of "lead users" was both very valuable in terms of coming up with good ideas and suggestions and stimulating other users to visit and contribute.

Challenges also appeared when the company tried to find and motivate independent developer firms to use the IW as a test platform for their beta versions of mobile services. Contacts were made individually with these firms and after initial skepticism the independent developer firms started to test their beta versions on the web-site. Their motivation was primarily about getting free reviews, suggestions and marketing from users. Once the IW-team had designed contracts protecting the independent firms' intellectual rights, the fear of being used by the large telecom company disappeared. Motivation of users with early and free trials of, for instance, new games was sufficient to get them trying the games. However, to get users to post reviews or voice any kind of user experience was harder. Here the

recognition of ambassadors was a key management practice. Selected ambassadors in turn stimulated other users to write about their experiences.

Finding and motivating developers to the contests in the developer's zone was similar to finding and motivating idea contributors. However, as software development skills were needed, the IW-team concentrated on activities at technical universities to get in contact with developers as well as some advertising on Google. Contests with larger sums of money (up to 5000 Euros) were used to motivate developers both for concentrating efforts in time and for motivating them (primarily students) to earn some extra money. Contest winners and runner-ups were also recognized on the IW web-site. The software contests required the IW-team to disclose relevant APIs and to provide technical and other support to software developing teams. These types of contests require a lot of assistance from the company to the student developers.

■ Appropriation challenges and appropriation competence – to capture users' contributions

When activities were picked up in the ideas and test zones, users started to voice concerns of being used and not compensated for valuable contributions. The policies of compensation for contributions had to be reviewed and discussed on the web-site. The same types of concerns were voiced by independent developer firms as well as student software development teams in the developers' zone. In general, management practices to handle these types of challenges were the same for all three zones: introducing standard contracts and transparent compensation schemes. On the web-site idea contributors could inform themselves about what the compensation was for, an idea that the telecom company thought was valuable. The telecom company would normally not pay more than about 500 Euros for any idea. This was equivalent to practices used by similar web-sites such as DellStorm. The exception was the developers' contests where a prototype of a mobile service could win up to 5,000 Euros.

■ Integration challenges and integration competence – to transfer user knowledge

The integration challenges appeared last in the process. Once an idea, a concept, a beta test or a developed prototype was considered to be valuable by the IW-team, the question arose of who should develop it further and where and how to transfer it. The system soon emerged with regular meetings between the IW-team and different sales and R&D-units in the company. Often ideas were considered interesting by the sales and R&D-units but they were unwilling to develop them further. Some of the ideas were then introduced to independent development firms for further development. When the sales units had portfolios of similar complementary services, the transfer was often done without problems. In order to get services more adapted to the needs of the sales units and R&D-units, a system of liaison managers were created that collaborated with the IW-team on a continuing basis.

Management practices developed by the telecom company in response to the managerial challenges in each innovation tool are summarized in table 1.

Table 1 - Management practices in relation to the online innovation tools and types of management competences

	<i>Disclosure competence</i>	<i>Appropriation competence</i>	<i>Integration competence</i>
<i>Search and idea generation</i>	<ul style="list-style-type: none"> - Concept contests - Recognition of ambassadors - Feedback system 	<ul style="list-style-type: none"> - Transparent compensation schemes - Feedback system 	<ul style="list-style-type: none"> - Professional ranking of ideas - Meetings with marketing and sales units - Liaison persons
<i>Development and prototyping</i>	<ul style="list-style-type: none"> - Disclosure of APIs - Guiding and supporting developers - Software development contests 	<ul style="list-style-type: none"> - Rewards in developer contests - Standard contracts for compensation 	<ul style="list-style-type: none"> - Meetings with marketing and sales units - Liaison managers
<i>Simulation and testing</i>	<ul style="list-style-type: none"> - Free trials - Recognition of ambassador reviewers - Meetings with independent developer firms 	<ul style="list-style-type: none"> - Standard contracts for compensation 	<ul style="list-style-type: none"> - Meetings with marketing and sales units - Liaison managers

■ Conclusions and further research

In this paper we have reported a case study on the implementation of online user innovation tools in a major Nordic telecom operator. The process triggered managerial challenges and development of new managerial practices. The management practices have been illustrated and systematized using a theoretically derived framework of three types of online innovation tools and three types of management competences. The aim of the framework is to inform management practice and research on relevant variables in the implementation process of online user innovation tools (cf. PORTER, 1991).

The major practices that were developed by the case company for finding and motivating users include contests, feedback systems, recognition systems, guidance systems and disclosing of APIs (disclosure competence). To handle the appropriation challenges, the company developed such practices as transparent compensation schemes, contest reward-systems and standardized contracts (appropriation competence). The integration challenges were handled by developing professional ranking systems, appointing liaison managers and institutionalizing regular cross-departmental meetings (integration competence).

The external validity of our findings is limited resting on a single case study. One way to strengthen the validity is to compare our findings with other similar studies. Dell IdeaStorm, another online user innovation web-site, operated by the PC-company Dell, was studied by GANGI *et al.* (2010). Dell IdeaStorm is, compared to the IW, limited to user idea search and generation. GANGI *et al.* (2010) identified a number of key challenges: (1) finding and identifying good ideas, (2) balancing needs for transparency and (3) disclosing ideas and sustaining a flow of ideas. These challenges are similar to the disclosure and appropriation challenges in our study. GANGI *et al.* (2010) study concerns only the actual web-site but not internal processes. Thus, they were not able to observe any integration challenges. In our view the study presented here provides a more detailed and managerially relevant view than GANGI *et al.* (2010). Our study highlights the importance of complementarities between external sourcing of knowledge and necessary internal competences, i.e. absorptive capacity, to successfully involve users through an online innovation tool (cf. CASSIMAN & VEUGELERS, 2006; COHEN & LEVINTHAL, 1990).

A key challenge in both our study and GANGI *et al.* (2010) is motivation of users and other external actors such as developers to take part in and use

innovation tools. Further research should study the issue of how to specifically motivate and incentivize external actors. Under which circumstances are users most likely to contribute to idea generation? Should advanced and ordinary users be treated differently? Moreover, issues regarding integration mechanisms were shown to be crucial and warrant future research. GASSMANN *et al.* (2010) as well as this study highlight the importance of intellectual property rights to open and user innovation. In this regard, issues like when and how it is appropriate to share and protect ideas and prototypes with users are important to research further.

The research presented here has several shortcomings. The fact that it rests primarily on one case study, in one particular industry, the telecom industry, and in one particular region, the Nordic countries, demands further studies. In particular, the case study is limited to software innovation in mobile services. The case is not chosen for representativeness, but we recognize that companies operating in other contexts may or may not confront similar types of challenges and develop similar types of practices (cf. ABDELKAFI *et al.*, 2009; CHESBROUGH & CROWTHER, 2006).

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