Managing Online User Co-creation in Service Innovation

Lars Bengtsson and Natalia Ryzhkova

Abstract In many economic sectors the users of existing products are the largest source of innovation, particularly so in the service industries. Users as an important source for innovations combined with the advent of web 2.0 have increased interest in online innovation tools. Nevertheless, the understanding of how to systematically generate, converse and exploit user and customer knowledge in the service development process remains limited. The purpose of the paper is to present a framework of capabilities and related management practices to the effective management of different types of online service innovation tools. The framework highlights the development of three types of service innovation capabilities and related processes: (a) online service exploration capability in order to find, direct and motivate users to contribute, (b) online service conversion capability in order to select, develop and appropriate users' contributions, and (c) online service exploitation capability in order to transfer, integrate and combine users' contributions into service offerings. In order to effectively utilize online service innovation tools a company need to develop these capabilities and related management practices. The framework and the management practices are built mainly on previous research on customer co-creation, user innovation and online innovation tools but also on case studies performed by the authors. The framework and management practices will be illustrated by a case study on a major telecom operator company's use of an innovation web site in order to generate ideas, test and design prototypes of new mobile services.

Keywords Online service innovation · User co-creation · Service innovation capabilities · Online innovation tools

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1 Introduction

In many economic sectors the users and customers of existing products are the largest source of innovation, particularly so in the service industries (Cohen et al. 2002; Tether 2005; von Hippel 2005). Users as an important source for innovations combined with the advent of web 2.0 have increased interest in online innovation tools (Prandelli et al. 2006; Ryzhkova 2012). Several approaches using social media, open source techniques and simulations have been proposed in the literature (Sahwney et al. 2005). Nevertheless, the understanding of how to systematically generate, converse and exploit user and customer knowledge in the service innovation process remains limited (Kristensson et al. 2008; Witell et al. 2011). In this chapter we propose the dynamic capabilities view in strategic management (Teece 2007) as useful in understanding the online service innovation process because of its intangible and co-specialized character.

The purpose of the chapter is to present a framework of capabilities and related management practices to the effective management of online service innovation tools. The framework is mainly built on the dynamic capability approach but also on previous research on customer co-creation (e.g. Kristensson et al. 2008), user innovation (e.g. von Hippel 2005), online innovation tools (e.g. Ryzhkova 2012) and on a case study performed by the authors (Bengtsson and Ryzhkova 2013). The framework will be illustrated by the case study on a major telecom operator company's use of a service innovation web site in order to generate ideas, test and design prototypes of mobile service innovations.

2 User Co-creation and Online Service Innovations Tools

Service innovations are usually not conceived in service firm labs or similar firm development units (den Hertog et al. 2010). They are more usually conceived by lead users (von Hippel 1986), user firms (Oliveira and von Hippel 2011), and knowledge intensive business service firms (den Hertog 2000) in a co-creative process (Witell et al. 2011). Service firms rely to a great extent on their actual and potential users for co-creation of service innovations (Michel et al. 2008; Matthing et al. 2004). The service-dominant (S-D) logic (Vargo and Lusch 2004) in service research holds that value could only be determined by the user in usage and in different processes (Michel et al. 2008; Lusch et al. 2007).

Firms engaging in both internal and external sourcing of knowledge exhibit better innovation performance than firms relying only on one or the other (Cassiman and Veugelers 2006). Users have been recognized as very valuable external knowledge source for innovation (von Hippel 1986; von Hippel 2005). Innovation by users has proved to be common in many industries such as juvenile products (Shah and Tripsas 2007), automobiles (Franz 2005), and services like retail banking (Oliveira and von Hippel 2011), and social services (Svensson and Bengtsson 2010). One type

of user innovation mechanism is to involve users through online innovation tools. These can be used to involve users and customers into sharing experiences, spawning ideas, test products or design products (Gangi et al. 2010; Prandelli et al. 2006). However, empowering users with tools and technologies have significant effects on the firm's capabilities as firms' have to adapt to a new way of dealing with users and user knowledge (Ogawa and Piller 2006; Prahalad and Ramaswamy 2004).

Online service innovation tools may complement as well as replace the traditional innovation tools. In relation to traditional tools the online innovation tools have the advantage of being interactive both in relation to the company's managers and other users. Interactive features of the online service innovation tools stimulate the development of proactive user attitudes. Users are then more prone to involve themselves in co-creation of new offerings (Ryzhkova 2012). Online service innovation tools may be broadly categorized into three types according to their particular role in the innovation process (Dodgson et al. 2006; Prandelli et al. 2006). One type of tool concerns *searching and idea generation*. Here firms explore user information through the exploration of user problems, needs and solutions. A second category of online innovation tools is *the prototyping and product/service design* tools, sometimes called user toolkits (Piller and Walcher 2006; von Hippel and Katz 2002). The service company either empowers its users to co-design a solution or implements methodologies to efficiently transfer an innovative solution from the user into the service company's domain. Thanks to the progress in web and information technologies various design software in software development using so called Application Programming Interfaces (APIs) and other design toolkits of this type of online service innovation tools are now readily available for most companies. The third category is *service or concept testing and simulation*. Solutions and concepts are displayed to users so they can react to proposed design solutions. Concept testing using focus groups, pilot or beta users are employed by companies collaborating with customers with the goal of service or concept testing facilitated by improved multimedia capabilities engaging users in realistic and appealing simulations.

3 The Framework of Capabilities and Online Service Innovation Tools

In the long run service innovations need to be repeatedly created and introduced. A capability to continuously introduce service innovations allow for competitive advantage in a changing environment. The dynamic capability approach (Eisenhardt and Martin 2000; Teece 2007) is a theoretical starting point for construction and analysis of dynamic service innovation capabilities overall and here specifically of dynamic online service innovation capabilities. According to Teece (2007, pp. 1319–1320) "Dynamic capabilities include difficult-to-replicate enterprise

capabilities required to adapt to changing customer and technological opportunities. They also embrace the enterprise's capacity to shape the ecosystem it occupies, develop new products and processes, and design and implement viable business models." Thus, the dynamic capability approach is a very appropriate starting point for building our framework of dynamic service innovation online capabilities. For our analytical purposes the "dynamic capabilities can be disaggregated into the capacity (1) to sense and shape opportunities and threats, (2) to seize opportunities, and (3) to maintain competitiveness through enhancing, combining, protecting and when necessary, reconfiguring the business enterprise's intangible and tangible assets" (Teece 2007, p. 1319). In analogy with the dynamic capability approach we propose a framework of online service innovation capabilities consisting of three types of capabilities and related management processes and practices: (a) online service exploration capability in order to find, direct and motivate users to contribute, (b) online service conversion capability in order to select, develop and appropriate users' contributions, and (c) online service exploitation capability in order to transfer, integrate and combine users' contributions into service offerings. In order to effectively utilize online service innovation tools a company need to develop these capabilities and related management practices, processes and tools.

To differentiate between operational capabilities and dynamic capabilities is often hard (Helfat and Winter 2011). We hold the view that operational capabilities could be defined as "how we earn a living now capabilities" (Winter 2003, p. 992), i.e., capabilities needed to run the existing operations, and dynamic capabilities as the "capabilities that would change the product, the production process, the scale, or the customers (markets) served" (ibid.). As Helfat and Winter (2011) note there is always change going on in the environment and that blurs the difference between operational and dynamic capabilities. Some operational capabilities are also used in processes such as product development. For our purposes it is sufficient to note that implementation of an online service innovation tool, which is basically an enhanced product development tool, have the potential to change existing products, develop new products, change the production process, the scale of the operations as well as serve new customers. Thus, when a firm introduce and implement a new tool like an online user innovation tool it will cause the development of new capabilities, reconfiguration of existing ones as well as use of existing ones if appropriate. The three online service innovation capabilities is thus a mix of more generally used operational capabilities, capabilities used in other firm processes, as well as more unique and dynamic capabilities only used in relation to the online service innovation tool.

## 3.1 The Three Online Service Innovation Capabilities

Understanding users, their needs and different user conditions are key in the service innovation process. Moreover, the combinatory nature of a service makes it necessary for service firms to understand how service components could be bundled

and unbundled (Normann 2002) to increase customer value in value constellations (Normann and Ramirez 1993). Thus a service firm needs to have systematic capability to find, direct and motivate users to contribute. This capability is a service exploration capability and parts of this service exploration capability may be based on the web and target online users and different kinds of third-party developers. Third party developers might be professional service firms such as software developers, content developers, marketing and Public Relations firms, but also individuals with particular skills such as software development, industrial design, interaction design, art work etc. In this chapter we only focus the capabilities related to the online service innovation tool. Firms might have other service innovation capabilities but this is outside the scope of this chapter.

3.2 Online Service Exploration Capability

The online service exploration capability consists of three processes. First, there is the process to tap users on detailed user information such as user needs, user patterns, user complaints, user responses to new services and so on. This online service innovation exploration process gives the firm the opportunity to understand the user in more detail and the usage environment of the service. For instance, by engaging in dialogue with users and their complaints about services might not only give information about the complaint itself but also the nature, the causes, the consequences and possibly the remedies of the complaint. For technology-based services such as mobile phone services or Internet services there are usually a lot of complaints around the compatibility of different systems, or rather the lack thereof. An online forum where users can signal these problems and the service firm could respond to them might immediately pay off in increased customer value for the service. More importantly, more detailed knowledge about user problems and needs may signal important unmet user needs. The second exploration process is to tap lead users (von Hippel 2005), experts and third party developers on expert knowledge of different kind. These "users" have deeper insights into user needs, solutions, new technological options and other important trends in general. These lead and expert users usually have stronger incentives than the normal user in solving different kinds of user needs, because they could profit either directly (solve their own problems) or indirectly (they get to supply some part of the solution and get paid for it) from the solution. By engaging in dialogue with lead users the service firm might identify new technological options, new developments on the market and new competitor and industry activities. The lead users are (outside the firm) experts in their fields and thus might hold valuable information about important trends and events. In mobile services smart phone gaming is an important market niche. Lead users in smart phone or computer based games are highly distributed in the world. These might have different backgrounds such as professional software developers to 15 year old school boys who are heavy game players. When searching for concepts for new digital games these persons are very

Fig. 1 Online service
exploration capability and its
processes
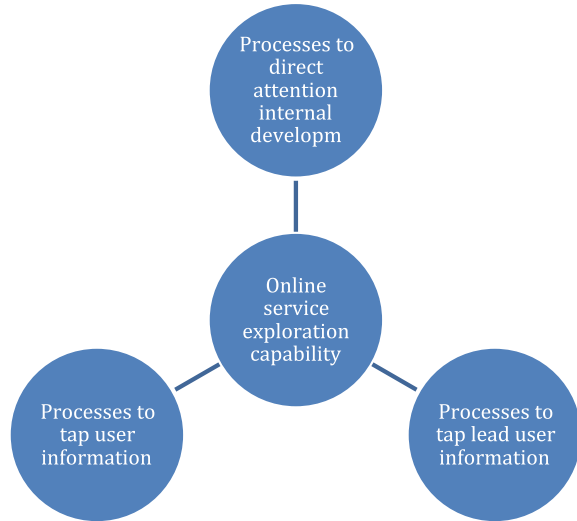
important to consult. The second exploration process is designed to tap these lead users of their expert knowledge.

The third exploration process is to direct attention from internal development units, e.g., R&D unit and marketing unit, to the online tool and the contributions from users and lead users. As internal development units are used to source their information internally, or from trusted external partners, the process to monitor and transfer the user information to the development units have to be developed. Otherwise the user information will just stay with the unit responsible for the online tool and the users themselves (Fig. 1).

3.3 Online Service Conversion Capability

The service innovation process is highly interactive and has a shared process character (Alam 2002; Magnusson et al. 2003). A single user idea is in itself seldom the whole story of a new service concept. It may start as a single suggestion from a user but then it will be co-created to a service concept through dialogue, feedback, responses, and perhaps voting. The capability of taking a user idea, a user suggestion, a user complaint, or even a user query to a service concept we have called the online service conversion capability. This capability will ensure that user ideas will receive responses, dialogue and feedback as well as will try to maintain users committed and loyal to the online tool. We have found three such conversion processes. The first conversion process is building loyalty and commitment among online users. Online users will in the longer run not participate in online forums if they are not recognized and rewarded in some way (Gangi et al. 2010). Tools that may be used for this are different kind of recognition systems where more active

and successful users (top innovator, top participant, experts, ambassadors etc.) are recognized and rewarded. Competitions are also commonly used to create interest and distribute rewards. The second conversion process is directing and delineating the user solutions. Not all service concepts are of interest to a particular firm. Many are not in line with the firm's strategy, business model or feasible because of lack of resources and competences. A direction and delineating process will ensure that user generated service concepts stay within certain limits. For technology-based services such as mobile or Internet services choosing a technology platform is an important part of such a process. Mobile services in forms of apps in smart phones are delineated to technology platforms like Apple's IOS, Google's Android or Microsoft's Windows. In such cases the firm need to communicate their Application Programming Interface (APIs) to user developers so they can develop their software that will work on the technology platform. The directive and delineating process does not only include availability of technology platforms but also communication which target customers, which type of services, type of business models that are relevant. For instance, online brand communities which have an online innovation component have delineated their interest into customer solutions which might fit the current brand. The third conversion process is the appropriation process. When new service concepts emanate from users there will be an intellectual property rights issue. The ideas and suggestions have not come internally from the firm and thus it is an issue who owns the service concept. To be able to handle the IPR issues is another vital process when sourcing service concepts from online users. Usual tools to use here are different kind of legal documents that users approve when start using the online forums. Securing the IPRs has to be balanced against the rewards and recognition system used by the firm. A user with valuable service idea has to be recognized and rewarded in a way that seems fair to the user. Otherwise the users will not continue to use the online innovation tool (Fig. 2).

Fig. 2 Online service conversion capability and its processes
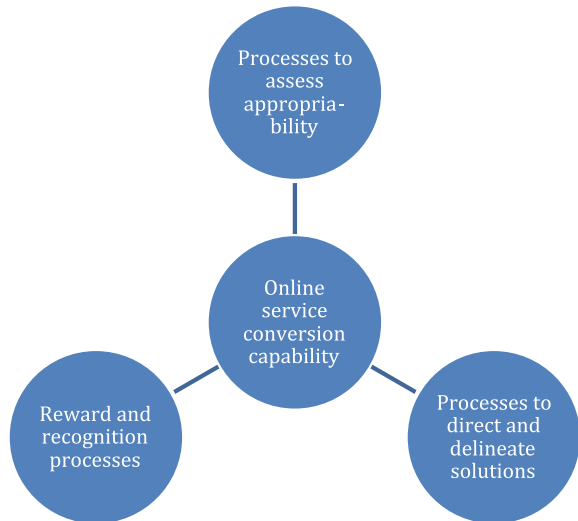
3.4 Online Service Exploitation Capability

The exploitation capability is about transferring, integrating and combining the service concepts and service prototypes into the firm's own service portfolio, systems or other firms' portfolios and systems. It includes finding marketing and distributing channels in the firm, combining new service concepts with other current services, reconfiguring current services, or combining them with other firms' current or newly developed service concepts. It also includes aligning internal incentives, transfer information and knowledge and enables continuous learning about the new services. The online service exploitation capability entails three processes. The knowledge process includes internal transferring of information and knowledge and learning regarding new service concepts developed by normal users, lead users or third party providers. Knowledge regarding a new mobile service needs to be transferred to the product and marketing units of the firm or to other firms. Usual tools used are different forms of liaison functions, new product board meetings, Intranet and Internet tools. A second process is the governance process creating incentives for internal or external units to transfer and integrate new service concepts from the development units to the marketing and distribution units in the firm or to other firms.

The third process is co-producing new service concepts from third party developers. While normal users and lead users could be thought of as third party developers, we are here referring to other professional service firms. The combinatory nature of services making them possible to bundle or unbundle (Normann 2002) may attract professional service firms to suggest that their current services (or new services) could be integrated into the portfolio of services of another service firm. This is common practice in hotels, restaurants, mobile services, retailing and so on. Hotels might provide premises for an independently run restaurant, car-hire firm and hair dresser to increase the value of the hotel service. An online innovation tool may be used to test third party service providers' services and to develop them to fit into the service firms' portfolio of services and firm systems (Fig. 3).

4 Innovation World: A Case of Online Service Innovation

Innovation World (IW) was the web innovation site for a major Nordic telecom operator. IW was an initiative from the central R&D-unit aiming to get closer to users and customers and to accelerate innovation in mobile services. The IW site had three user forums. The first forum was for user ideas, comments and dialogues. The second forum was the prototype testing forum where the company itself or independent service developers may launch and test beta versions of services such as new games and let users try these for free and then publish reviews, comments, suggestions for changes and improvements. A third forum was for independent developers, or lead users, of software where software developers could get information and support about APIs and other relevant information and support material.

Fig. 3 Online service
exploitation capability and its
processes
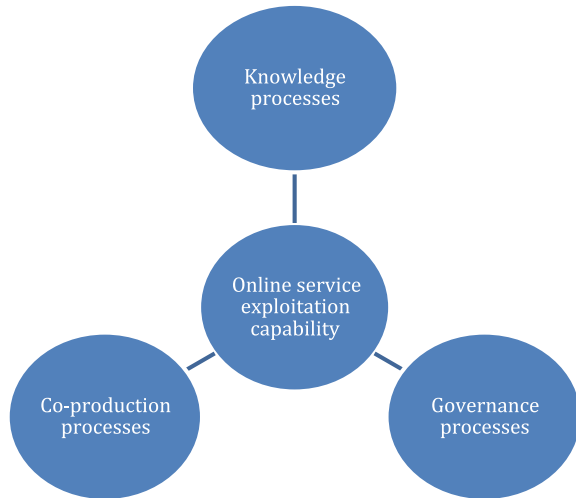
The team managing the online innovation tool, the IW-team, formed a separate unit within the corporate R&D-unit with their own objectives and personnel. The IW-unit was represented through the IW project leader in the top management team of the R&D-function. There were also idea managers among the IW-employees who gave feedback (official) and tried to motivate test users to write reviews. The two major sources to attract new visitors and members were through advertising on Google search and then piggybacking on the company's activities at universities and other schools where they attended and showed their advertising material. The IW-team wanted primarily to recruit lead users to the web site. As lead users where thought of being either software developers and/or heavy users of mobile services such as games the IW-team targeted universities and especially engineering schools to stage different kinds of activities. To differentiate between lead users and more ordinary users was not very easy. The IW-team also wanted traffic and activity on the web site, thus ordinary users also joined the IW. The most active user contributors were recognized in different ways as top contributors and so on. Some were named "ambassadors" and in exchange for early trials of new services, recognition on the site and some gifts in the form of mobile appliances they had to perform more thorough tests of the mobile services, write reviews, comment and vote on other users' contributions and provide their own suggestions. The IW-team recognized winners in contests, the ambassadors, most active contributors and latest and hottest contributions on the web site.

To raise activity on the IW web site, get more ideas, discussions and direct attention of the users as well as get more activity from lead users the IW-team added more content on the web site. They also divided the idea and search generation activities into user expert groups on issues like future network technologies, the digital home, design of interfaces etc. The IW idea manager had to constantly respond to ideas and discussions in order to keep up the dialogues and suggestions.

New interesting material had to be introduced regularly. Internal experts provided specialized material to the expert groups in order to get more directed discussions and ideas as well as tests of new concepts.

Users, especially lead users and independent third-party developers, were from the beginning concerned about compensation and ownership issues. The IW-team had from the beginning a contract that all members of the IW community had to approve which gave the intellectual rights to the firm of everything that was posted on IW. Compensation for valuable ideas, ideas that the firm would start to use in their service offerings, sell to others or use in their internal processes, were promised to be given up to maximum amount equal to about 1.000 US dollars. The compensation was however not satisfactorily when the IW-team launched a competition for independent developers on best software application for mobile networks in the developers' forum. A price sum of some 5.000 € to the winner was given. The IW-team also contacted small independent software developing companies to interest them in developing mobile software and to beta test them on the IW-site. They started with companies they already had a business relation with and then continued to contact companies they had not been working with before. Some third-party developers were suspicious that the large telecom company tried to "steal their ideas". The IW-team then developed standardized contracts regulating the 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. The process of licensing and transferring a third-party developed software from the IW-unit to a sales and marketing unit in the company was roughly the same as the process for services developed internally by their own R&D-unit (Fig. 4).

In order to transfer interesting user ideas, user developed software applications and favourable reviews on beta tested mobile services to the company's sales and R&D-units the IW-team set up regular meetings with relevant sales and R&D-units.

Fig. 4 Management practices and tools used related to the online service exploration capability in the IW-case
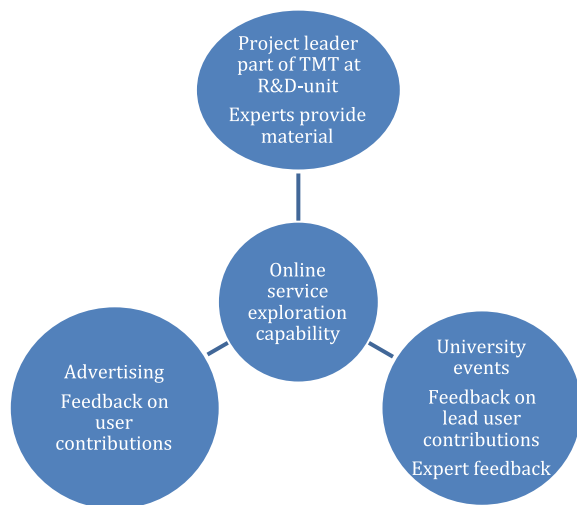
Fig. 5 Management practices and tools used related to the online service conversion capability in the IW-case
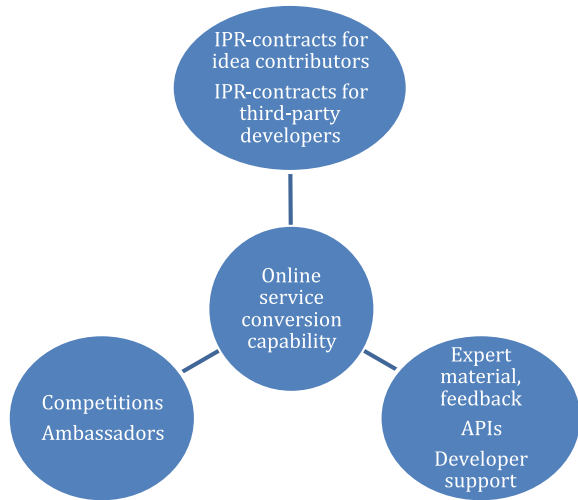
These units were after a while appointed liaison managers that had regular contacts with the IW-team. The liaison managers also provided expert material to the web site in order to direct and stimulate some of the flow of ideas and comments by the users. To stimulate marketing units to adopt services developed in the IW-tool into their service portfolios rankings and comments from the users were used to prove market interest. The marketing units also had objectives to meet, such as specific number of new services that created user interest, had to be introduced each year. For independent third-party developers they had a choice to launch them in the telecom company's service portal or launch them in another firm's mobile services portal (Figs. 5 and 6).

Fig. 6 Management practices and tools used related to the online service exploitation capability in the IW-case
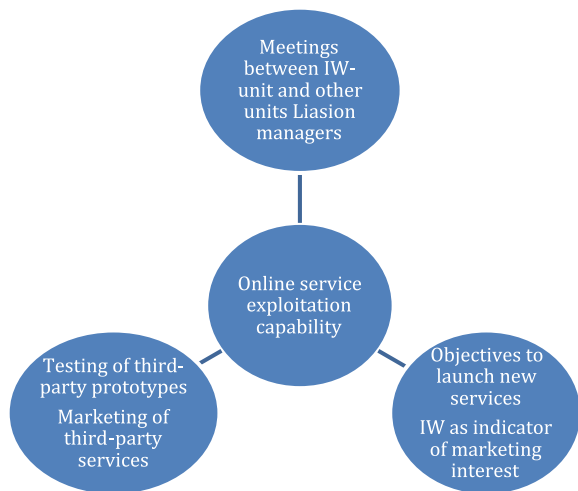
4.1 The Creation of New Online Innovation Capabilities and Reconfiguring of Existing Capabilities

The types of challenges the managers experienced in the implementation process of the online innovation tool were initially problems of finding and motivating users and lead users to contribute. The IW-team was piggy backing on the firms' routines to run student events, to increase awareness and interest of the company as a future employer, at universities and the number of users did reach the targeted levels. The marketing of the web site was not good enough in the beginning but later complemented with more general advertising on Google search, competitions and small rewards for recruiting new members. Thus, the member recruiting, that was part of the information tapping process from users and lead users was a reconfiguration of the student recruitment process used by the Human relations unit in the company.

Another challenge for the IW-team, indicating the need for a new or reconfigured process, was the feedback system. In the beginning of IW feedback on user ideas and suggestions was not regularly provided in order to further develop user ideas and discussions, hence the user discussions died. As this was something completely new for the company, new routines, practices and tools had to be developed to form two new processes specific to the online tool—tapping of information from user and lead users. For both processes, routines to give regular feedback, responses and appraisal to users' contributions was important. A system of keeping track of discussions, the level of activity and whether the IW-team had addressed and provided input to the discussions was developed. For instance a user complaint had to be responded to within a certain time period. The normal users often had complaints, more ordinary suggestions, and questions of functionality. The more expert-oriented lead users had more complex and technologically advanced questions, ideas and suggestions. For these users a more expert oriented support had to be organized where internal experts could provide information, responses and the discussion could be organized in specific expert forums. In these expert forums more background information could be provided, for instance on new technological options, and internal experts could organize challenges, put questions and so on. As many lead users also were software developers; programming tools, APIs and software development support had to be provided. These tools were used both to stimulate and tap lead users of their information as well as in a directing and delineating conversion capability.

In addition there were challenges finding and motivating independent developers to use IW as a test platform for their beta versions of mobile services. As the activities picked up in the idea generation and test zones, new type of challenges appeared; challenges related to appropriation. Users, especially lead users started to voice concerns about being used and not compensated for valuable contributions. Compensation in contests and testing of beta services had to be decided as well as policies for compensating other valuable contributions. The mobile service idea contest as well as other discussions in the idea zone provided some interesting ideas for the company. Here the integration problems appeared; mainly the questions of

who should develop the ideas further and how it should be transferred. Compensating users for their ideas resulted in the development of transparent compensation schemes for valuable ideas using compensation schemes from other similar web sites and internal practices on appropriation issues. The practices related to the integration challenges developed partly based on previous practices of regular meetings between sales units and the R&D-unit, appointing liaison managers but also new practices of professional ranking of ideas.

The processes forming the new and re-configured capabilities to handle the challenges related to the implementation of IW came from three different sources; previous internally developed practices, vicarious learning from other firms, and learning-by-doing. In the case of testing beta-services the appropriation and integration practices could all partly be copied from previously developed practices as the company had previous experience of testing their own developed mobile services on users (though not through an open web site). Moreover, the internal routines and contracts for transferring a new service from the R&D-unit to the different business units in the company were also used for transferring and licensing a third-party developed service. The challenges of user ideas and discussions in the idea forum proved much more difficult for the IW-managers to handle as they had very limited experience from this before. Instead they relied on vicarious learning through studies of other similar web sites, such as Dell Storm, in order to figure out relevant practices. Especially the practices of motivating users to contribute were studied. For instance, to get a flow of ideas they started concept competitions intended to run every year. Giving timely feedback to users on ideas and suggestions also proved to be difficult for the managers to handle and here they relied on experimentation and learning-by-doing to create a system which ensured providing timely feedback to user comments.

5 Conclusion

One of the top research priorities in service research is to "capture the ways in which companies are innovating services" (Ostrom et al. 2010, p. 12). Understanding how online user co-creation can be an effective service innovation tool has been the aim of this chapter. In order to further our understanding we have introduced a capability-based framework (Teece 2007) for online service innovation. We base the framework on the capability-based approach in strategic management (Eisenhardt and Martin 2000; Teece 2007) and in service innovation (den Hertog et al. 2010), previous research on user innovation (von Hippel 2005) and online innovation tools (Prandelli et al. 2006; Ryzhkova 2012). Three online service innovation capabilities have been identified, their sub processes and related management practices and tools. The chapter provides a managerially relevant view of the complementarities between external sourcing of knowledge and necessary internal capabilities to reap the benefits of involving users through an online service innovation tool.

While the aim of our framework is to inform both management research and practice a few research and managerial implications must be mentioned. Dynamic capabilities and their consequences such as reconfiguration of existing capabilities and development of new capabilities do not come for free. Implementing an online service innovation tool could result in heavy investments in new capabilities and reconfigured capabilities. Thus, there is a need for understanding the costs and risks of dynamic service innovation capabilities and balanced view on these tools. Some firms may find it relatively easy to develop and make effective use of the online service innovation tools as they have made previous resource endowments that could be utilized (Teece 2007) and thus are in the position to implement low-cost solutions (von Hippel 2005). Other firms have greater difficulty in development of appropriate capabilities for online service innovation tools. Understanding how different resource endowments affect the cost and risks of implementing online service innovation tools is both a future research issue and an important managerial issue.

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