

Seppo Leminen (ed.)

CO-CREATION WITH USERS AND CUSTOMERS IN LIVING LABS

Integrating users and customers in companies' business processes



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Executive summary

Our study focuses on co-creation from the perspective of firms that involve customers and users into their innovation development. Specifically, the study investigates co-creation in the living lab context, which represents the ever more popular open innovation model. We utilize the case study methods in order to illustrate and discuss our findings. The study is organized as follows:

Chapter one brief describes the aim, scope, and the structure of the study. Chapter two gives short introduction to the importance of users in innovation development, and continues to depict the differences between open and closed innovation. Chapter two also describes the differences between user-centric and user-driven innovation. Chapter three briefly reveals the state-of-the-art of the UDOI approach (= User Driven Open Innovation) within the participant companies' business processes; i.e. the needs and challenges of the companies regarding user participation in their innovation processes.

Chapter four begins with an introduction of the changing business environment that challenges the companies' current modes of operation. After that we discuss the current status of user and customer involvement as part of business operations. All interviewed companies recognized the importance of a deep involvement of users and customers, but they seem to lack the means of understanding how and when to involve the users in an innovation process. User-centric methods are used widely yet user-driven methods are scarcely used. In our analysis, we divided co-operation with organized user communities into three areas: the user pool and its tools, processes and operation models of the external service supplier, and rules of co-operation, all of which we discuss briefly.

Chapter four is designed to find answers to the use of UDOI as part of companies' product and service development processes. In here a model of user co-operation and differences in development projects of

the UDOI Booster cases are presented and analyzed. We found out that at least four different kinds of actors could be identified in living labs: utilizers (companies, whose business cases were to be developed), scientists (universities, whose role was to provide research and at the same time promote their own studies), organizers (both utilizers and researchers whose task was to control and co-ordinate) and the users (actual users who were the source of information and operational resources). It should be noted that in these cases the roles of the stakeholders varied and it was possible to be in different roles at the same time. In this study, we focus mainly on the activities of utilizers and the development of UDOI use in three cases within the UDOI Booster project.

Chapter five concludes the findings found in a research conducted as a part of the Flexible Service research program in the UDOI (User Driven Open Innovation) Booster research project into current research avenues by stating that companies recognized the importance of a deep involvement of users and customers but they seem to lack the means of understanding how and when to involve users in an innovation process. This study has been conducted in two parallel phases. First phase, an UDOI research project when the four ICT companies participate in the Tivit (Tieto- ja viestintäteollisuus Tivit Oy) Flexible Service SRA (strategic research agenda) research program more specific UDOI (User Driven Open Innovation) Booster, which is one of Flexible Services -program projects. The aim of first phase is to:

- Reveal the state of the art of the UDOI approach (= User Driven Open Innovation) within the companies' business processes i.e. the needs and challenges of the companies regarding user participation in innovation processes.
- Understand the use of UDOI as a part of companies product and service development processes

The second phase is more theoretical. It is targeted to understand what is co-creation with users and customers, i.e., when integrating users and customers in companies' business processes.

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Table of Contents

EXECUTIVE SUMMARY	3
1 INTRODUCTION	9
1.1 Background	9
1.2 Objectives	10
1.3 Methods and delimitations	11
1.4 Structure of the report	12
2 INNOVATION CO-CREATION WITH USERS AND CUSTOMERS IN LIVING LABS	14
2.1 Importance of users in innovation development	14
2.2 Innovation development in Living labs	16
3 THE STATE-OF-THE-ART OF UDOI IN COMPANY PRACTICES	18
3.1 Introduction	18
3.2 User and customer involvement in innovation processes	19
3.3 Challenges for the companies and the need to integrate users and user communities into their innovation processes	22
3.4 Integration of users and user communities into the companies' innovation processes	24
3.5 Findings in UDOI Booster cases	27
4 UDOI AS A PART OF COMPANIES' PRODUCT AND SERVICE DEVELOPMENT PROCESSES	30
4.1 The use of user generated data in product and service development	30

4.2	Changes needed for implementing UDOI processes	36
4.3	Converting product and service development process towards UDOI model	38
4.4	Integrating students with the Flexible Services UDOI Booster project	40
5	FINDINGS AND CONCLUSIONS	42
	REFERENCES	46
	APPENDIX 1 8X8 IDEATION METHOD	52
	APPENDIX 2: CONTEXT MAPPING	54
	APPENDIX 3. DIALOG CAFE	55
	APPENDIX 4 STORYTELLING	57
	APPENDIX 5: WHY-WHY-WHY METHOD	59
	APPENDIX 6: VOX POPS	61

1 Introduction

Seppo Leminen & Mika Westerlund

1.1 Background

Understanding customers has become an essential part of firms' business and innovation activity. Integrating customers in order to learn from and with them in the innovation process is a key success factor for companies (Edvarsson et al. 2010). Particularly, the Internet has altered the proposition that listening to the customers can help firms improve their products and services (Michel et al. 2008). Today's organizations need a constant flow of ideas while competing through emergent technologies and fast new product development (Kao 1997). As hardly any company can ignore customers' input to its innovation processes, a growing number of firms pay attention to the users and their views as sources of useful feedback, relevant use experiences, important ideas, and new information. In fact, as a result one of the most important trends in contemporary consumer society is the progressive inclusion of consumers in firms' processes where value is co-created (Arvidsson 2008). Firms involve consumers in the co-production of brands, experiences, design, marketing strategies, and even product or service development (Zwick et al. 2008).

Valuable applications are ever more innovated by innovation networks. They comprise those linked actors that create, acquire, and integrate diverse knowledge and skills required to innovate complex technologies. According to many scholars (e.g., Snow et al. 1992; Calia et al. 2007), innovation networks provide the necessary resources to change the firm's business model in order to achieve competitiveness. However, there is a major change in the ways firms consider their operation in innovation networks. This is due to the fact that 'open innovation' is of particular interest to industries today (Wu and Lin 2001; Paulson et al. 2004; Bonaccorsi et al. 2006). Its idea of involving customers and users as co-innovators in the firm's R&D has become popular. This being said, the present focus is especially on open innovation communities, where various actors, such as firms, customers and end users par-

ticipate innovation development as co-developers. Technology has provided easy and cost-efficient communication channels through these communities and made it attractive to bind customers more closely to the innovation processes (Antikainen et al. 2010).

An organized collaboration among the participants involved is a key aspect of innovation networks (Gadde et al. 2003). Users are integrated to firms' R&D processes in order to help firms to exploit first-hand use experiences and ideas for new products and stimulate employees' imagination in development projects (Alves et al. 2007). In addition, along with the open innovation model, customers and users have become true co-creators of value (Möller et al. 2008). Management and operation in conventional innovation networks is often similar to projects and aims at creating value to customers based on their suggested needs (Andersen and Vaagaasar 2009). However, the depth of integration of customers in the open innovation model differs from the conventional view, and there is variation even between the diverse forms of open innovation, e.g. Open Sourcing (von Hippel 2001; Feller and Fitzgerald 2002), Crowdsourcing (Brabham 2008; Sloane 2011), and the living labs model (Mensink and Katzy, 2007; Schumacher and Niitamo 2008; Ståhlbröst, 2008). Hence, living labs provide an especially interesting context for understanding customer co-creation.

1.2 Objectives

Holistic frameworks and models of co-creation from the open innovation perspective remain still scarce. Therefore, we focus this research gap by studying co-creation from the perspective of firms that involve customers and users into their innovation development through the living labs model. Specifically, we aim to:

- Understand what co-creation is when integrating users and customers in companies' business processes.
- Reveal the state of the art of the UDOI approach (= User Driven Open Innovation) within the firms' business processes, i.e. the needs and challenges of the companies regarding user participation in innovation processes.

Chapter three supports our aim by discussing the following questions via conducted case:

- What are the categories of user and customer involvement in firms' innovation processes?
 - What are firms' challenges and needs in integrating users or user communities into their innovation processes?
 - How should users and communities be integrated into the firms' innovation processes?
- Discuss the use of UDOI as a part of firms' product and service development processes.

Chapter four supports our aim by discussing the following questions via conducted case:

- How is user-generated data utilized in the service development of companies?
- What changes are required for implementing UDOI processes?
- How should an existing product and service development process be guided in order to reach UDOI?

1.3 Methods and delimitations

Our study employs an empirical qualitative research approach in trying to understand co-creation from the perspective of firms that involve customers and users into their R&D processes. Our research embraces four ICT companies that participate in the Tivit (Tieto- ja viestintäteollisuus Tivit Oy) Flexible Service SRA (strategic research agenda) research program. More specifically, they are included in the UDOI (User Driven Open Innovation) Booster, which is one of the Flexible Services program's projects. We conducted eight semi-structured interviews in the UDOI project. The interviews were supported with participatory observation and the analysis of Dicole materials (database of the project material) during fall 2009 and spring 2010. Furthermore, we conducted a total of 27 semi-structured interviews with senior management, in-

cluding CEOs, CTOs, sales directors, and project managers within various ICT companies.

All the data was collected during the years 2007 and 2010. The ICT industry was chosen because open innovation practices are most utilized in the high-technology industries (Chiaroni et al., 2011). Therefore, we reason that the evolution in becoming an open innovator is most advanced among ICT firms, and they can offer information on how innovation and co-creation models have changed. An important selection criterion for the cases was that the firms' innovation development process involved active co-creation work with customers. Our case companies make benefit of customers or users in their R&D or provide such services to other firms. Additional 40 interviews were conducted among personnel in selected living labs in Finland, Sweden and Spain in order to gain insight into the use of open innovation approach as an innovation method.

All interviews were carried out by face-to-face meetings with the researchers and the interviewees. Interviews were audio-recorded for transcription and analysis, and some issues that emerged from the interviews were detailed later via additional phone conversations. The interview questions were developed and specified on an ongoing basis following the discussion with the representatives of companies in order to find out the modes of involving users in the product and service development process. In addition, our material comprises extensive secondary data in the form of relevant web sites, bulletins, magazines, and case reports. Due to confidentiality reasons, we are unable to reveal the identities of the informants or their organizations in our analysis. However, we provide a short note of the informants' positions and their areas of responsibility, as well as the type of their companies or organizations along with excerpts from the original interviews.

1.4 Structure of the report

This report is structured as follows: after this brief introduction in Chapter 1, we discuss the foundations of innovation co-creation with users and customers in the living labs context in Chapter 2. Then, we talk about the state-of-the-art of UDOI in company practices in Chapter 3. After that, in Chapter 4, we depict UDOI as a part of firm's product

and service development processes. Finally, we conclude the report by providing a summary and discussing the implications derived from the study in Chapter 5.

2 Innovation co-creation with users and customers in living labs

Mika Westerlund & Seppo Leminen

2.1 Importance of users in innovation development

Customers and users are in the nucleus of business and innovation activity. They even take various roles in innovation process, such as helping with innovations, creating new ideas, or creating value (Edvarsson et al. 2010). We anticipate that the role of users and customers differs in diverse forms of innovation development. Innovative organizations exploit various sources of ideas for new products and stimulate employees' imagination in order to fill the pipeline that nourishes new products (Alves et al. 2007). However, as people today live in an ever-shifting world of networks redefining their lifestyles and fragmenting culture, firms are finding it difficult and costly to understand their customers and it is becoming a challenge to develop products that meet hyper-differentiated consumer demands (Arakji and Lang 2007). Many companies no longer attempt to grasp the details of consumer needs and use experiences, but instead reassign the design aspect of product development to external sources of ideas, like their customers and other consumers.

Product life-cycles are shortening in many industries. As a result, development phases of products and services should be increasingly faster and the time period for revenues should be better addressed (Duhamel et al. 1995). Traditional view on innovation development projects has uncovered the role of 'lead users' as a response to this challenge; they are those individuals whose everyday life is affected by the consumption of the firm's product and who have the skills to modify and personalize the product (Dahlander et al. 2007). Moreover, as information technology (IT) is permeating the various dimensions of new product development, the innovating firm's relationship with its customers is

changing, allowing us to relax the conventional assumption of complete separation between producers and consumers (Arakji and Lang 2007). Technology is enabling novel forms of producer-consumer collaboration in the product and service development process.

Although idea about the dual role of customer as a 'prosumer' (producer and customer) is not new (Edvarsson et al. 2010), only recently research has underlined the shifting role of users as innovators (Dahlander et al. 2008). Parallel user and customer insights as a part of the development process is seen to speed up the development phases of products and services. Moreover, it has been documented that understanding of users' needs is expensive and labour intensive (Korkman 2006). Zaltmann (2003) states that at least 80 per cent of new products and services fail when launching them into market, even if in many cases customer analysis have been conducted. Therefore, the need for integrating users and customers to a new product and service development as co-developers has been increasingly accepted. Co-development is about co-opting customers' competence and bringing the customer into the innovation process and design shop (Edvarsson et al. 2010). It enables a firm to understand customers' actual behaviour, needs and future trends better.

With co-development in the innovation process, the result is intended to be innovative, and not solely customized (Edvarsson et al. 2010). The earlier avenue of integrating users in the innovation development was called customer-centric approach. Probably the most widely spread traditional way in innovation projects has been to collect customer feedback concerning the company's products and services as well as its procedures (Payne 2006; Edvarsson et al. 2010). However, as mentioned above, customers and users are now so intimately involved in the development and usage processes that they have become true co-creators of value (Möller et al. 2008) and the new open innovation model is called customer-driven. To co-create value, the firm and its customers and partners must reconcile their objectives and define the role and effort required from each party and an equitable division of the returns (Chesbrough 2003). In fact, Chesbrough and Appleyard (2007) point out that shifting the focus from ownership to the concept of openness in projects requires a total reconsideration of the processes that underlie value creation and capture.

Customer-focused innovation development has challenges. Occasional surveys targeted to the clientele do not allow for continuous data collection despite the changing customer attitudes and needs. Experi-

ments also show that ideas from customers often come up as being more original and valuable but in-house developers' ideas are more realizable (Edvarsson et al. 2010). In customer-driven model, user insight and input steer the direction of product development processes heavily, yet respect other participants' views. For example, Chesbrough and Appleyard (2007) claim that openness is the pooling of knowledge for innovative purposes where the contributors have access to the inputs of others and cannot exert exclusive rights over the resultant innovation; and, thus, value created through an open process would approach that of a public good. Cassiman and Valentino (2009) argue that the strategic organization of R&D should simultaneously consider the choice of the type of R&D to be performed (basicness) and the organization of R&D, which includes the choice about the exposure of the R&D project to knowledge from outside the firm (openness).

2.2 Innovation development in Living labs

The concept of living lab is related to the ever more popular open innovation model phenomenon. Because of providing a promising alternative to the traditional closed innovation development, open innovation is of particular interest to many industries today (Wu and Lin 2001; Paulson et al. 2004; Bonaccorsi et al. 2006). Open innovation model has been supported by the emergence of social media phenomenon (e.g. "Web 2.0"), which has brought many new services on the Internet, based on content sharing and content based interaction. According to Hämäläinen (2007), successful innovation development nowadays combines understanding of existing and emerging user needs that provide business opportunities and require adaptable technologies. In living labs, the technology is tested in a real-life context, and customers and users are important informants in the tests (Kusiak 2007).

Living labs are co-creation environments for human-centric research and innovation. The purpose of co-creation between customers, providers and third parties is to stimulate change (Möller et al. 2008). The concept of 'living lab' should be distinguished from test beds for controlled testing of a technology or application in a laboratory environment (Ballon et al. 2005) and field trials for testing in a limited but still real-life environment (Schaffers et al. 2007). Ballon et al. (2005) defines the living lab as an experimentation environment in which technology is given shape in real life contexts and in which users are con-

sidered actual co-producers. Living labs are physical regions or virtual realities where stakeholders have formed a partnership of firms, public agencies, universities, institutes and users all collaborating for creation, prototyping, validating and testing of new technologies, services, products and systems in real-life contexts. Hence, living labs represent the open innovation model, as suggested by Kulkki et al. (2005), who provide an overview of open innovation environments for validating, testing, and developing new products and services.

Stewart (2007) makes a distinction between different types of living labs. He identifies them as narrow but 'sizable' communities of expert users, whole bounded populations, living labs for technical service development, and living labs for non-technical research using service platform, in e.g. business clusters. All these types have something in common: they employ an array of actors representing different rationale for joining the innovation development. Indeed, according to Schaffers et al. (2007), networking is an integral part of living labs. Living labs allow a focus on value generation and distribution in a network of cooperating partners, including users. In addition, many living labs join large regional or global networks of living lab, such as the Living Labs Europe, an initiative that constitutes of a number of European living labs, distributed geographically. Together these partners, consisting of a number of living labs with users, firms, public sector and academia, develop and offer a gradually growing set of networked products and services and share information, knowledge and experience on the development work at hand.

3 The State-of-the-Art of UDOI in Company Practices

Seppo Leminen & Minna Fred

3.1 Introduction

The companies analysed in the study are in "*a challenging transitional period of products and services in regard to life cycle*" and "*a big transformation.*" The business environment is turbulent and changing, and companies are shifting to, or relocating part of their activities in third countries. The life cycles of products, services and systems shorten, while the business operations and business models of existing products and services are changing, and partly crumbled. Universal recession also brings its own requirements for efficiency, emphasizing that within the companies "*we make what the customer pays, or what has a clear cost and benefit*" and "*the work load is pushed up to 100%.*"

Businesses need the means to cope with these challenges. Democratization of innovation, where the "*6-person 'fist workshop' in Australia is able to build a technical device*", create new business challenges and opportunities. The pioneer companies have exploited the competitive advantage obtained from the development and rationalization of processes. One essential way to survive in the race is user information and the growing importance of user involvement in business operations. The companies are opening their product development and feedback interfaces towards users and customers. The consumer is the king, and anthropologists can act as the company's future saga builders.

3.2 User and customer involvement in innovation processes

Companies are already making use of customer and user information so the user and client involvement is recognized but end-user involvement in different stages of the development process calls for an organization to apply new kinds of practices. The starting positions and the clients of the companies vary as some of the companies operate only in a business-to-business market and they are not in direct contact with end-users:

"Typically, our interface is only our client. Typically, no one ever meets the end-users, except where the aim is to knowingly organize the end-users' test situation."

Some companies have developed means by which the consumer can become a developer:

"... We can bring innovation closer to the consumer, closer to developers, and the fact that innovations are developed in the social space, in the service and locally."

All of the interviewed companies recognized the meaning and importance of the deep involvement of users and customers as part of their own business operations. The development phase and stage of openness in customership processes varied greatly in the companies interviewed. Some of the companies are in the beginning of the development phase and in practice user involvement is difficult in the firmly guided innovation tube. In some of the companies the co-creation processes are clearly identified; the customer feedback is integrated (one way or another) in the development process of a new product or service. User driven companies are set to take on the "concierge" and "butler" roles with consumers. The companies want to know their consumers' needs and behaviour and thereby be able to anticipate them as a butler can. The concierge role of the company could help the user and the consumer to actively search for new information, because the information is readily available.

"It is essential for us to decide how close and how centrally, we want to approach the customer and the consumer."

Companies have so far acted in a closed world in which the release of products and the development policies of services and products have been well-kept secrets. Principally, the companies utilize closed developer communities, technical platforms and their own personnel in developing and testing products, services and systems. The personnel also participate in idea collection and idea processing. The companies open up and utilize different forums, developer communities and lead-user meetings, in which there might be participants from different occupational groups from students, professionals, entrepreneurs to representatives of large companies.

"... This kind of thinking about crowdsourcing and working together with lead users and partners"

Based on the first year's interviews a classification of corporate R & D activity was developed (Figure 3.1). The classification is based on the company's flexibility in product development and its linkage to users. The flexibility is seen as the degree of openness to create new knowledge with users and it is described by the dichotomy of the open-closed axel. The classification also takes into consideration the starting point for the product development, i.e. whether it is technology-driven, user-centered or user-driven.

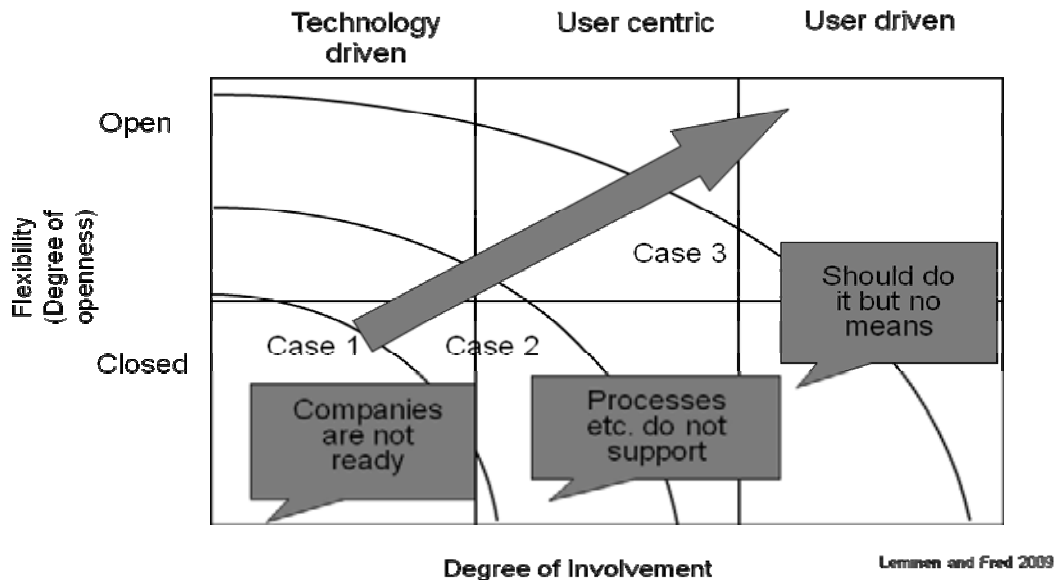


Figure 3.1 State of art of UDOI use within companies' business processes

The starting points and stages of user-driven product development are very different in the companies interviewed. Corporate R & D processes range from undefined, ad hoc product development processes to UDOI scale development processes (Leminen and Fred 2009). Thus the more the development cycle is specified and the greater the number of projects is done, the easier it is for a company to move towards UDOI action model. As shown in the Figure 3.1, there are differences with regard to depth and quality of integration of customer information to product development process.

The three cases (Case 1 - Electronic Service Voucher, Case 2 - Mobile Ticketing and Case 3 - Augmented Reality) in the UDOI Booster can be classified according to the R & D classification model (Figure 3.1). In the following, each case is presented in detail from UDOI case work perspective.

Case 1 is based on a technology-driven development, which is guided by a strong intention to keep information strictly within the company. This style of the company could be termed as "closed-technology-based development company." Case 2 could be described as an enterprise, which takes into account the users' product development activities

mainly in the form of surveys. In this case, however, the company sees quite firmly that the information relating to product development is for the company's internal use only. This type could be described as a "closed user-centered development company". The company in question in Case 3 is a company that has learned to use the user knowledge and the product development process is partly an open innovation environment. This company is heading towards UDOI business model in which users are an active part of the product development process and product development activities in the environment of open innovation. In Case 3 the company's activities could be described as "an open user-driven development".

The classification shown in Figure 3.1 does not imply superiority or even a company's need for the development from one section to another. The classification is based on many variables, which guide the company to operate in different ways in different cases. Such variables include the line of industry, competitive factors in the market, the form of the service developed and identifying and reaching customers or end-users. The relevance to the company is to notice different types of activities and decide what kind of methods to use in each case.

3.3 Challenges for the companies and the need to integrate users and user communities into their innovation processes

There are different ways to describe an innovation process. In this summary, we use three stages of general innovation process: ideation, conversion and diffusion stages. Based on our interviews it seems that technology-driven product development is the dominant mind set in the companies. The users become a part of operation when the company has an idea and/or concept of the ideas, or the product or service idea is refined quite far.

It was considered very important that at the ideation stage the active ecosystem generates new ideas, which allow commercial co-operation with other actors. Open innovation in the form of crowdsourcing was particularly done within the company, because the personnel was seen as a selected user group that has know-how on matters on the agenda.

"We will focus our crowdsourcing activities. The group that can contribute better ideas, because our process of harvesting the ideas is not at the same

level as our way of committing and getting people to share their ideas with us."

New knowledge can be obtained through social interaction, such as using and analyzing competitors' products. In addition to that the companies utilize the feedback from the service and customers.

Above all, at conversion stage the solution design is considered to be an internal operation of the company because

"The technical solution is to some extent zeros and ones, and there needs to be certain exclusions. We've noticed that it can be inflexible when moving in different directions."

The significance of end-users is emphasized when innovation process varies between the open and closed mode of operation.

User involvement is seen as an opportunity but new means are needed because

"It is a time-hardened lead-user, who wants to be in this stage, but of course we should probably expand it to this stage as well."

The diffusion stage was discussed relatively little in the interviews, but it became apparent that the partnership network has an important role at this stage. Proximity to the user, however, was seen in one of the companies as being so important that it intends to change the way it operates through their network.

Companies utilize the information obtained from customers and users in different ways in different stages of the innovation process and users are seen as a cost-effective development resource. User involvement varies in different projects and business units even within one company. Even though companies exploit the customer and user feedback in the different phases of innovation process, the long span interaction between companies and users is missing. As the user-driven mode of operation becomes more common and its use expands in the business field, seeing users as developers can become a critical resource for the company's innovation process. In this case, there is an increasing need to take advantage of the existing user communities in the long span (see also a marketing paradigm change from acquiring new customers to keeping the existing customers).

The differences are in the stages, regularity and in the way companies involve their customers and users. Customer and user integration in business operations is more common in the operations which are closer to the market. This is natural because of the daily customer and user interface. However, as product and service life cycles shorten, the integration of customer and user information in as early phase as possible becomes increasingly important.

Usability testing and various user-centric methods are well-established as part of the processes; so much so that the user-centric design is used in one of the companies in approximately 97% of projects, but the user-driven design in only about 5% of the projects. The definition of user-centric and user-driven is not entirely clear:

"Sometimes the line between co-creation with end-users and user-centric design is hard to define. ... In co-creation the users are genuinely planning the service or the device, its characteristics and implementation together with the company's own R&D team. In user-centered design the main focus is on the input that the internal R&D team filters and gets tested by the users. The user and his/her needs are, of course, studied but the user is not part of the actual design. However, in some of the methods used, e.g. the diary method, the users propose functionalities that are taken into consideration. That is why it is not necessary to draw a definite line between user-centered and user-driven."

3.4 Integration of users and user communities into the companies' innovation processes

The transition from closed, even secret product development activities, to more open ones is a big step for companies. They have concerns about the company's knowledge and information leaks, IPRs and the conservation of clients' trust. Confidence in their own customers is a prerequisite for the current business operations to continue. Even the pioneer companies say that the change into an the open operation

model is made by trial and error because there are no models to support the change of innovation process from closed into an open funnel. Companies seek opportunities and benefits of crowdsourcing platforms (cf. Ovi, Aivo) that support open innovation, either by developing them themselves, or by making use of platforms developed by others (e.g. Owela). In some cases the open mode of operation has led to losing business opportunities to competitors but on the other hand it has led to realization of the value of consumer information and the possibility of using it in various stages of the innovation process.

"We need to understand how the idea is enriched in a funnel, where the open/closed innovation varie, i.e. when someone has an idea of open innovation, developed in an open innovation domain, when (because we're a profit-making organization and we want to make profit for our shareholders) it is closed. When should we do it internally? How is the value added for the customer and for the company in a process like this when the idea is enriched in the open/closed -funnel? However, it is not until it is in the hands of consumers that the innovation becomes materialized."

Companies have their own historical backgrounds, which affect the capacity to take on new ways of operating within a company and their business units. It seems that different professional groups have different ways of involving end-users; to some it appears to be more natural than for the others. Besides the old ways of operation, the companies have other challenges as well, i.e. business models, process control, short span work planning, limited resources and their allocation in internal work. It is also perceived that the explication of the benefits of involving end-users is difficult. Concretization of tangible economic benefits of user involvement should take place internally within the organization, but also to end-users and customers. Companies feel they need information and training on the benefits of user involvement, its possibilities, methods and means as part of their business operations.

"We have X people at work who have learned to work in a certain way and it cannot be changed in a day, not in a year or maybe not in five years. Selling usability is a good allegory because now that it has been trumpeted for the last ten years it can be sold."

Companies see a clear need for organized user communities, but the planned co-operation seems to depend on the stage of the innovation process. Co-operation with organized user communities could be done in two ways; traditionally, at the end of the innovation process as product and service functionality (relevance) evaluations, but also in a whole new kind of idea development and downstream processing in the early stages of the innovation process.

There are several challenges in operating with organized user communities. Companies have first of all their own internal challenges in that the owner can be found for the process and it gets enough resources. User interaction requires resources. User interaction could be made more effective by developing peer support of organized user communities. User interaction could also be made more effective by creating tools for orchestration, management and control of user communities, so that interaction can be improved.

This may also affect the internal division of labour and through that contribute to new ways of operation. The challenges of co-operation with organized user communities can be divided into three areas that are user pool and its tools, processes and operation models of external service supplier and rules of co-operation.

The companies have a clear need to find new motivated users, get them involved in their operations and keep up their attention, so the development of models for rewarding and motivating the user communities becomes increasingly important. The companies feel that users should be involved in the innovation process at all stages (e.g. pre-concepting stage), but they have not found the means to do so.

"End-users do not want to be involved in the grinding, wretched projects."

"It is too much assumed that people are eager to develop things. We are waiting for someone to develop a good idea that we could grasp. I think it violates human nature. If we all were open innovation people the television would look different."

The companies have a need for different user pools, user communities, which could be either international and/or domestic. Companies have an ongoing need for users' new views. The most important thing would be to bring together motivated people, for example, young "diginatives". The companies see as a trend so called agile methods, in which

the whole process from design to testing is done in small pieces. This would allow taking end-users as a part of fast iterative process. The feedback was seen as an important motivational aspect in an user and developer community as well as the fact that community members see the meaning of their own contribution in the development process. For the group dynamics it was proposed that there should be personal meetings in addition to the work in the web. One view is that the users should be able to participate whenever it suits them, so there is a need for mobile crowdsourcing.

3.5 Findings in UDOI Booster cases

In this chapter the UDOI Booster cases were analyzed by a model that classifies corporate R & D activities. The flexibility of the companies was examined by the open-closed axel referring to the openness and closeness of the innovation environment. The model took into consideration also the starting point for product development, i.e. whether it is technology-driven, user-centered or user-driven.

In the current operational environment, the product development towards the UDOI action model brings out challenges that need to be solved. The development challenges and needs that have emerged include finding and refining end-users and user communities, the development of methods for collecting and creating information and knowledge, the co-operation models of external service suppliers and rules that relate to that co-operation.

Based on our interviews it seems that even though companies exploit the customer and user feedback in different phases of the innovation process, the long span interaction between companies and users is missing. The companies emphasized improvement of efficiency as one of the key issues because they have invested and continue investing a lot of resources in understanding the needs of the users. Some of the companies have also invested in learning, piloting and using the user-centric and user-driven methods. It is not only about learning something new but it is also about the internal need for change, that is learning from current and past practices which slow down the change. Companies go through and value different kinds of methods and ways in which user needs are effectively addressed. Depending on the starting point of the companies it takes time to adapt user-centric and user-driven methods. Based on the interviews the re-use of customer and

user data and knowledge is low. Interestingly enough, the companies emphasize the possibility of learning through insights when working together in projects. This at its best can lead to organizational learning.

"It can be much more important to the company that they are able to come up with good questions than good answers during the process."

The improvement of cost-efficiency requires cumulative of learning and re-use of information. Cumulative learning takes place in e.g. innovation transfer and selling the idea from one stage of innovation process to another but the cumulative of learning should take place not only in all stages of innovation process but also in the whole ecosystem. User information should not be siloed in the organization. The more efficient use of organized user communities is an unused opportunity for the companies and they should be developed further through pilots in selected organized developer communities. Building new knowledge with users, co-configuration can also be seen as a new mode of working.

"I think that in 10 years it is quite obvious that the companies have user pools, user networks, their own peers as part of customer care sparring from which different groups can be involved in different types of innovating and testing."

Companies consider it important that co-operation with organized user communities will have clear business-based rules and starting points. The tools used should include access-control, which is used to monitor who contributes and what. This originates from the fact that there are open questions like liability, IPR, publicity of information and confidentiality. They are issues that slow down the new way of operating.

"... I think that we have not exactly taken in the consideration what the publicity or public use means. What is the value of the information? Is there value to us? Is there value to people involved? Is the found value lost if it is made public?"

The companies are described to be in "a challenging transitional period of products and services in regard to life cycle" and "a big transformation." The business environment is turbulent and changing, companies are shifting to, or relocating part of their activities in third countries. The life cycles of products, services and systems shorten, while the

business operations and business models of existing products and services are changing, and are partly crumbled. Global recession also brings its own requirements for efficiency, emphasizing that within the companies "we make what the customer pays or what has a clear cost and benefit" and "work load is pushed up to 100%."

Businesses need means to cope with these challenges. Democratization of innovation, where the "6-person "fist workshop" in Australia is able to build a technical device", create new business challenges and opportunities. The pioneer companies have exploited the competitive advantage obtained from the development and rationalization of processes. One essential way to survive in the race is user information and growing importance of user involvement in business operations. The companies are opening their product development and feedback interfaces towards users and customers. The consumer is the king, and anthropologists can act as the company's future saga builders.

4 UDOI as a part of companies' product and service development processes

Minna Fred, Seppo Leminen & Mika J. Kortelainen

4.1 The use of user generated data in product and service development

It is challenging to distinguish the terms customer and user in this research project as terms were used differently in each case. In all cases the users have been defined as persons who will use the product or service concept in their daily life in the future, so they could also be called end-users. For example, in Case 1 the customers would be those who would provide the service concept to end-users. As a result of that the end-user should be seen and viewed first and foremost through a business network. It is essential to understand that the customer and the end-user can mean clearly different things to different companies.

Based on the interviews conducted in 2009, a classification of corporate R & D activity was developed and further discussed in chapter 3. In this chapter the same classification is used (Figure 4.1) and it is based on the company's flexibility in product development and its linkage to users. The flexibility is seen as the degree of openness to create new knowledge with users and it is described by the dichotomy of the open-closed axel. The classification also takes into consideration the starting point for the product development, i.e. whether it is technology-driven, user-centered or user-driven. The classification does not imply superiority or even the company's need for the development from one section to another towards the UDOI action model but it is designed to help companies elaborate their positions and what is important in the co-operation with end-users.

The three cases (Case 1, Case 2 and Case 3) (*Note the cases are referred to as numbered cases 1 - 3 in all chapters. The numbering is identical to chapter 2; Case 1, Case 2, and Case 3. Alaviitteeseen*) in the UDOI Booster can be classified according to the R & D classification model (Figure 4.1). Case 1 is based on technology-driven development which is guided by a strong intention to keep information strictly within the company. This style of company could be called as "closed-technology-based development company." Case 2 took into account the users' product development activities in the form of surveys and workshops. In this case, however, the company sees quite firmly that the information relating to product development is for internal use only. This type could be described as "closed user-centered development company". The company in question in Case 3 is a company that has learned to use the user knowledge and the product development process is partly an open innovation environment. This company is heading towards UDOI business model in which users take an active part in the product development process and product development activities in the environment of open innovation. In Case 3 the company's activities could be described as "an open user-driven development".

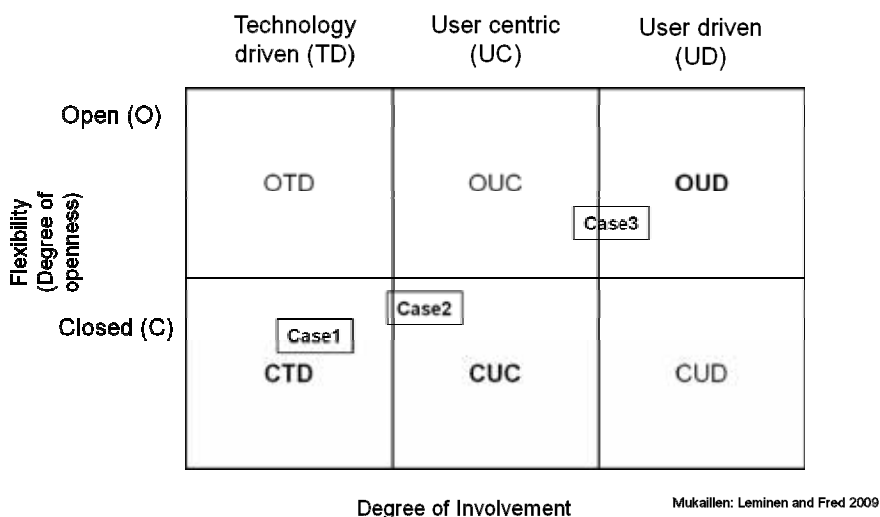


Figure 4.1 Classification of the UDOI cases

When regarding the operations mode of UDOI cases, it was noted that most of the co-operation with end-users happened through UDOI researchers and not for example in co-operation with estab-

lished customer communities. Figure 4.2 illustrates the process of co-operation in UDOI Booster.

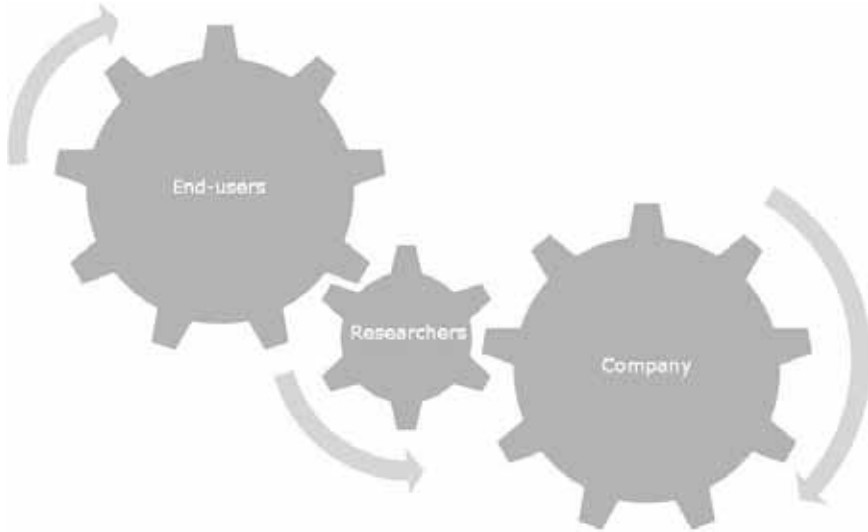


Figure 4.2 Co-operation with end-users in UDOI Booster cases

Based on the cases and the illustration of co-operation between end-users and companies, two different approaches of customer involvement were created. The three different cases had different roles for the users in their development process. First, the traditional approach of customer involvement, which is termed as a customer-centered model, as shown in Figure 4.3 (A), is where the customer or the end-user is seen primarily as a source of information. In that approach the company is not able to obtain all the necessary information from the customers as the company sets objectives and guidelines for what kind of information is important. In Figure 4.3 (B) the company seeks co-operation with customers and new business opportunities based on this co-operation. End-users are seen as subjects who give knowledge and guidelines to the company. In Case 1 the users were regarded as important producers of knowledge yet their influence in the development process was marginal. As in Case 2 the project and the company are learning a business model in which the customers influence is boosted, yet it stays quite small in an actual development process. Case 3 is the closest of all the cases to a customer-driven activity.

The company sees the customers and users as subjects who have valuable knowledge in both product development and orientation of the research activities.

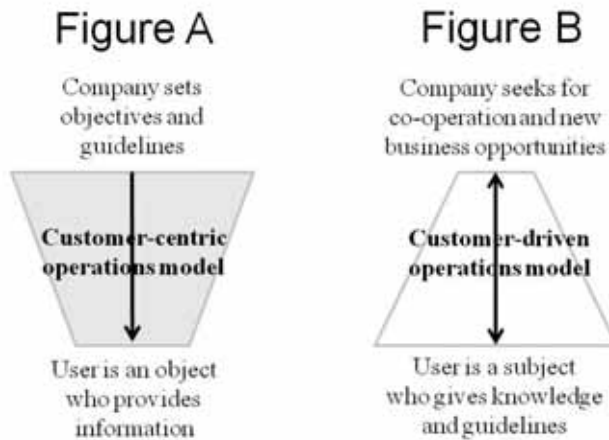


Figure 4.3 Two different approaches of customer involvement

All three cases were in the pre-process and/or ideation phase of the product and service development process. However, the end-user empowerment, the participation of end-users and regularity in communication differed in each case. In Figures 4.4, 4.5 and 4.6 the two different approaches of customer involvement which were presented in Figure 4.3 are demonstrated in each case. The grey triangle refers to a customer-centric operations model and the white one to the customer-driven operations model. The role of end-users in a company's product and/or service development activities can be visualized as a metaphor of a "row of teeth" in which co-operation is sought to describe the company's responsibility and regularity of operations. The "row of teeth" shows the company's interaction with users and exchange of information and knowledge in relation to that. The picture should be regarded as suggestive, and not as an accurate picture of activity. The width of the "teeth" and the row illustrate the length of the interaction in each case.

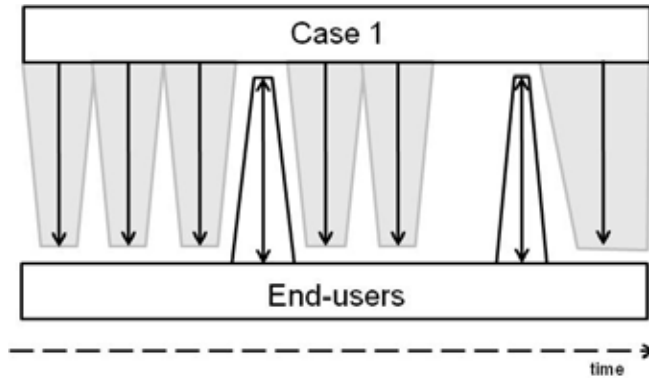


Figure 4.4. Company and end-user interaction in Case 1.

In Case 1 (Figure 4.4) the approach of the product development of the company is built on the company's internal operations and short-term liaison with users during the development cycle. The company is cautious with knowledge-sharing activities, yet it sees the users as producers of knowledge at certain stages of the productization process.

Case 2 can be described as a closed development environment. Even though the company involved in Case 2 is a large company and for that reason it would have the financial resources and the opportunity to build UDOI based product development activities but it operates only in a business-to-business market and not in direct contact with end-users. Even though the user-centered activities have begun within the company, the UDOI approach certainly requires new kinds of specifications in the product and service development process. In Case 2 (Figure 4.5) the company had adequate long-term goals, which seem to have linkage to the openness of the company. As the time span of the development is put far enough, the company's operation has moved towards an open environment: since the information and knowledge are processed further into the future, it does not pose a business risk.

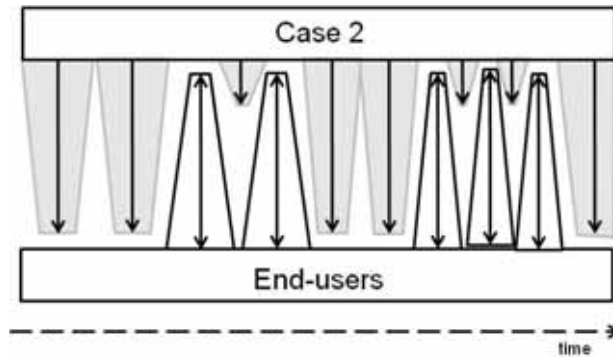


Figure 4.5 Company and end-user interaction in Case 2.

Case 3 can be seen as a supporter of the open development environment. The company's strength is undoubtedly in its size which provides financial and operational resources to direct resources to development activities. Parallel research activities within the company allowed it to gather information and knowledge from different sources and through well-documented processes, which are part of knowledge-sharing, new knowledge is created. In terms of openness this kind of model does not pose a business risk at this stage. A user-centric approach is well-established within the company, yet it is moving towards UDOI (Figure 4.5). An open interaction with the users and the flexibility in processes allow user-driven knowledge to influence the product and service development. The company and end-user interaction in this Case 3 proceeded through trial and error, which is a common feature of learning in an open development environment.

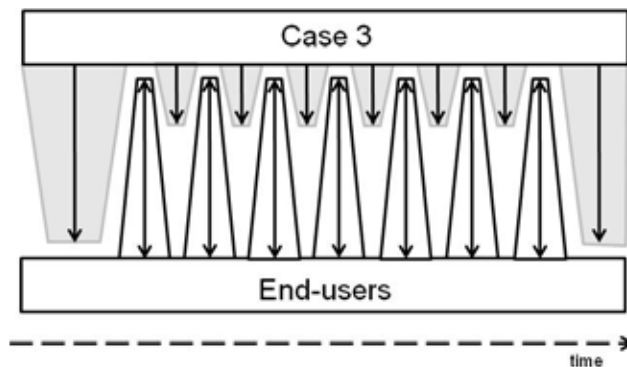


Figure 4.6 Company and end-user interaction in Case 3.

4.2 Changes needed for implementing UDOI processes

To steer the company's service and product development towards more UDOI, investment in product and service development process and leadership is required. Investments should not only be made in financial or personnel resources but the companies need to build their operations models in such a way that the utilization of user knowledge is possible. All company representatives brought forward the possibilities of exploitation of user information and knowledge and they stated for being just in the initial stage in the use.

The starting points of the cases were clearly very different. The company in Case 1 had resourced internally so that one person resourced in the project had relatively little opportunity to participate in the research project. The company also had the shortest development span as it aimed to receive some business benefit from the research already the next year. This aim could be linked to the size of the company as the SME's need to turn a profit as quickly as possible. In Case 1, it is evident that having only one person in the R & D co-operation formed a bottleneck in the flow of information and its exploitation.

Case 2 succeeded in resourcing and objects formulation. The company in Case 2 had clearly set a longer time-span than the others for the use of knowledge which allowed it to digest the information in its own organization. Co-operation with research communities was linked through the few persons, but the knowledge was shared inside the company in a well-planned manner as the actual team was over ten persons who could link the knowledge to their own tasks.

Case 3 had resources not only for this project, but also a parallel project so the company generated a significant amount of information about users and user behaviour. The company has developed a way to collect process information and develop knowledge which creates new significant knowledge for the company's product development. The time-span for this project was two-sided; it had both short and long term objectives. Even though the company is smooth with the processes, at the same time its operations in this

project were guided by a trial and error formula, i.e. the company sought to do things even if it wasn't completely sure of the outcome. This approach may produce information that would otherwise remain undiscovered.

Although resource allocation does not directly implicate the company's investment in the research project, it has a direct indication in forms of co-operation with end-users and research communities. The contacts of the companies play an important role in the exploitation of user information and knowledge: if the company has no connections to different stakeholders, it is hard to transfer research knowledge to the company. Different kinds of reports and deliverables are only one part of the knowledge transfer as part of the knowledge is transferrable only through person-to-person communication and developed further in co-creation. There is a big difference in the transference of this kind of tacit and unanalyzed knowledge between the cases.

4.3 Converting product and service development process towards UDOI model

Based on our study, it is evident that the UDOI approach is the most suitable for companies that have already taken up customer-focused product and service development practices. That means that they have been able to develop their own business towards the direction of open innovation and that they have opened up the flow of information between the user and the company. It appears that the company needs to develop towards UDOI one development stage at a time. According to the R & D classification model used in this summary (Figure 4.1) the company will take steps in stages and not be able to shift from a closed technology-based development model straight to an open user driven model. Theoretically, a company must be able to change their mind-set from an 'I'll take and use' approach to 'I'll take and I will give' -approach which is perhaps the biggest challenge for companies seeking to steer their product and service development processes towards more UDOI. The change is not easy as it could be predicted already with the question raised in UDOI Booster project: what are the benefits for the users?

When comparing the three cases it was found that there are differences in the stages, regularity and in the way companies involved their customers and users. Customer and user integration in business operations is more common in the operations which are closer to the market. This is natural because of the daily customer and user interface. However, as product and service lifecycles shorten, the integration of customer and user information in as early phase as possible becomes increasingly important. Figure 4.7 illustrates a synchronized co-operation: the cogwheels of a company, customer community and end-user rotate in different directions enabling the cogwheels to turn. We claim that the company should synchronize its operations with a customer community in order to be able to move towards the same direction as the end-users; through co-operation with a customer community a company is able to reach the end-users.

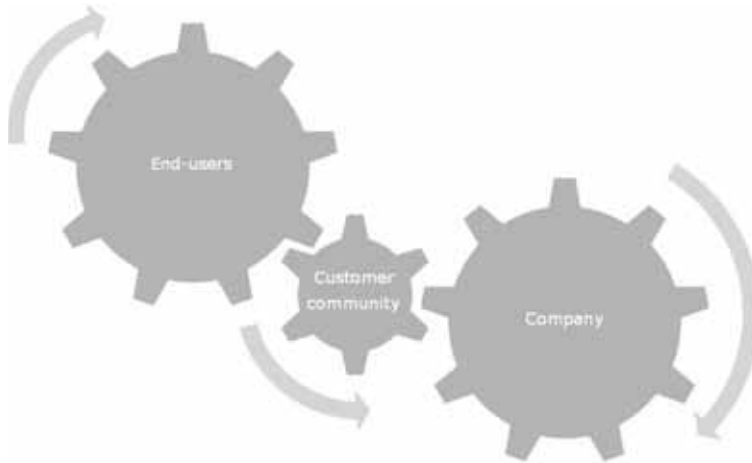


Figure 4.7 Synchronized co-operation of end-users and companies

The transition from closed, even secret product development activities, to more open ones is a big step for companies. They have concerns about the company's knowledge and information leaks, IPRs and the conservation of clients' trust. Confidence in their own customers is a prerequisite for the current business operations to continue. Even the pioneer companies say that the change into open operation model is made through trial and error because there are no models to support the change of innovation process from a closed into an open funnel.

According to our study, the key factors for a successful the UDOI case were the following:

- The strategic importance of the project to the company
- The company's internal involvement in the project
- Both short-term and long-terms goals
- Clearly expressed objectives and benefits to all stakeholders of the project
- Ability to co-operate with customers

Most importantly one should consider whether the UDOI Booster project did produce the kind of skills and knowledge that were defined as objectives. It could be agreed that the information increased in the project but did it create new op-

erations models that could be integrated within the company or even transferred to other companies?

4.4 Integrating students with the Flexible Services UDOI Booster project

Besides the research carried out by the Senior Lecturers and Principal Lecturer, the Learning by Developing (LbD) approach was used in the UDOI Booster project. A total of 46 students were part of the project gaining a total of 460 credits. Thirteen students were involved in the Augmented Reality case as students from Laurea SID Leppävaara and Laurea Kerava co-operated in the joint project.

33 students were chosen to work with the Mobile Ticketing case in seven different teams. The goal of the study was to find out the needs for additional services, and to generate user innovations. The study was carried out during the academic year 2009-2010.

The research questions in the Mobile Ticketing case were:

- Why would one use a mobile ticket?
- What kind of additional services are seen interesting?
- How should the support and help in malfunction situations should be organized?

As part of their project the students evaluated the user-driven methods they used in their innovation processes. The evaluation of the methods consisted of the general idea of the method, the stage of the product or service development where it could be used, the strengths and weaknesses of the method, and so on. See Appendix 1-7 for the evaluation templates in more detail.

5 Findings and conclusions

*Seppo Leminen, Mika Westerlund, Minna Fred
& Mika J. Kortelainen*

ICT companies and other firms alike are in “a challenging transitional period of products and services in regard to life cycle” and “facing a big transformation”. The business environment is turbulent and changing; companies are shifting to, or relocating part of their activities in third countries. In addition to that, the life cycles of products, services and systems shorten, while the business operations and business models of existing products and services are changing, and are partly crumbled. Last but not least, the importance of users is growing. More and more companies are opening their product development and feedback interfaces towards users and customers. The consumer is the king, and anthropologists can act as the company’s future saga builders. Opening up the innovation work through customer co-development has been suggested as a new and important way of listening to the customer and translating customer information into value creating offerings (Thomke and von Hippel 2002; Jeppesen and Molin 2003; Edvarsson et al. 2010).

In this study, we focused on innovation co-creation from the perspective of firms involving customer and user into their innovation development. Specifically, we studied co-creation efforts in the living lab context that represents a form of the ever more popular open innovation model. Living labs are physical regions or virtual realities where stakeholders have formed a partnership of firms, public agencies, universities, institutes and users all collaborating for creation, prototyping, validating and testing of new technologies, services, products and systems in real-life contexts. We first aimed to understand what innovation co-creation is when integrating users and customers in companies’ business processes. We recognized that, in concordance with prior literature (e.g. Goers 2011), difficulty and complexity as well as the degree of value creation increase step-by-step when firms move into open innovation. Moreover, we revealed the state-of-the-art of the

UDOI approach (= User Driven Open Innovation) within the companies' business processes; i.e., firms' needs and challenges regarding user participation in innovation processes. Finally, we aimed to understand the use of UDOI as a part of companies' product and service development processes.

Our key premise was that companies recognize the importance of intense involvement of users and customers, but they seem to lack the means of understanding how and when to attract and involve the users in an innovation process. This challenge is addressed in prior literature on open innovation (e.g., McFathing 2011). There are two opposite ways to interact with the customers. In user-centric approach, the customer or the end-user is seen primarily as a source of information. This approach is increasingly helped by technology, which makes it possible to touch and learn from customers' actual behaviours over time and on an individual level (Edvarsson et al. 2010). The opposite way is user-driven approach in which the company seeks close co-operation with customers and new business opportunities based on this co-operation. End-users are not only seen as subjects who give knowledge and guidelines to a company, but the customer must become an active participant and co-developer in the innovation process (Edvarsson et al. 2010). A company must be able to change their mind-set from the "I'll take and use" approach to "I'll take and I will give".

In our study, we elaborated firm interaction with users and classified co-operation via case studies. The classification took into consideration the starting point for the product development, and, therefore, pondered whether firm's co-operation is technology-driven, user-centered or user-driven. We provided three illustrative cases to explain and characterize this classification. In addition, our investigation into living labs revealed at least four different kinds of required actors in the living lab model: utilizers (companies, whose business cases were to be developed), scientists (universities, whose role was to provide research and at the same time promote their own studies), organizers (both utilizers and researchers whose task was to control and co-ordinate) and the users (actual users who were the source of information and operational resources). It should be noted that in these cases the roles of the stakeholders varied and it was possible to be in different roles at the same time. In this summary we focus mainly on the activities of the utilizers and the development of UDOI use in three cases within the UDOI Booster project.

Case 1 described a technology-driven development, which is guided by a strong intention to keep information strictly within the company. This style of a company could be termed as "closed technology-based development firm." Case 2 described an enterprise, which takes into account the users' product development activities mainly in the form of surveys. This type could be termed as a "closed user-centered development firm". Case 3 described a company that has actually learned to use user knowledge, and where the product development process takes place at least partly in an open innovation environment. In Case 3, because of its activities, the company could be called as an "open user-driven development firm". As a part of this study, students at Laurea University of Applied Sciences evaluated these user-driven methods used in firms' innovation processes. Evaluation of the methods consisted of the general idea of the method, the stage of the product or service development where it could be used, the strengths and weaknesses of the method, etc.

The starting points of the cases were clearly very different. Corporate R&D processes ranged from undefined, ad hoc product development processes to UDOI scale development processes. User-centric methods were used widely, yet user-driven methods are scarcely used. It seems that even though companies exploited the customer and user feedback in different phases of the innovation process, the long span interaction between companies and users was missing. The companies emphasized improvement of efficiency as one of the key issues because they have invested and continue investing a lot of resources in understanding the needs of the users. Some of the companies have also invested in learning, piloting and using the user-centric and user-driven methods. It is not only about learning something new but it is also about the internal need for change, that is learning from current and past practices which slow down the change. Companies go through and value different kinds of methods and ways in which user needs are effectively addressed. Depending on the starting point of the companies it takes time to adapt user-centric and user-driven methods. Further, the re-use of customer and user data and knowledge is low.

User information should not become siloed in the organization. The best way of making benefit of this information is to disseminate it and deliver co-creation experiences throughout the organization. Similarly, more efficient use of organized user communities is an unused opportunity for the companies (Kozinets et al. 2008), and this potential should be harnessed and developed further into realization through pilots in selected organized developer communities. Building new knowl-

edge with users, as well as co-configuration work can also be seen as a new mode of working. The role of end-users in a company's product and/or service development activities can be visualized as a metaphor of a "row of teeth" in which co-operation is sought to describe the company's responsibility and regularity of operations with the user. The "row of teeth" shows the company's interaction with users and exchange of information and knowledge in relation to that. As our cases illustrate, the "row of teeth" may vary considerably by the stage of innovation development and the firm.

There are some limitations in our study. Our analysis has been conducted with case companies in the ICT-industry, which may turn out to be not a typical case industry among other industries. This requires analyzing companies in other industries too. As this study emphasizes strongly the role of users in the process, we suggest that the future studies involve more different types of interaction and projects in order to gain more heterogeneous ideas, resources, and experience when integrating users and customers in companies business processes.

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Appendixes:

UDOI project used method evaluation template

Appendix 1:	8x8 ideation method
Appendix 2:	Context mapping
Appendix 3:	Dialog cafe
Appendix 4:	Storytelling
Appendix 5:	Why-why-why method
Appendix 6:	Vox pops
Appendix 7:	UDOI poster

APPENDIX 1 8x8 ideation method	
Method name: 8x8 ideation method	
Name of the contributor(s): Laurea (Minna Fred & students)	
Time period when used in UDOI project: 9-12/09	
General idea of the method:	
In the ideation method 8x8, the main topic is divided into eight subtopics which are then divided further to eight more. With this method total of 64 ideas are raised.	
Case or research related details	
Name of the case:MOFS Mobile ticketing	
Description of the case where the method has been used:	
The method was used to generate user ideas and gain understanding of user needs related to mobile ticketing in local public transport.	
Product or service development stage:	
Functional product or service	<input type="checkbox"/>
Non-functional prototypes	<input type="checkbox"/>
Early stages of the design process	<input checked="" type="checkbox"/>
Innovation, very early phase	<input checked="" type="checkbox"/>
Used human resources in this case (man-days):	
1-5	<input checked="" type="checkbox"/>
6-10	<input type="checkbox"/>
11-20	<input type="checkbox"/>
more	<input type="checkbox"/>
Practical suitability (at this particular case, what was the support to casework):	
Pros and Cons (at the case where used)	
General comments	
Human resource min. (Estimate. Needed from start of test planning to end of analyses)	
1-5	<input checked="" type="checkbox"/>
6-10	<input type="checkbox"/>
11-20	<input type="checkbox"/>
more	<input type="checkbox"/>
Founded strengths of the method (Also estimate about validity and reliability if possible)	
Founded weaknesses of the method (Also estimate about validity and reliability if possible)	
If the topic is very narrow it might be challenging to get the 64 ideas in total.	
When to use this method (recommendation, suitability in user driven open innovation work)	
This method could be used in the early phase of innovation by both by users and researchers but it could be also used as an analyzing template.	
Notices (something else than above)	

Appendix 2: Context mapping

Method name: Context mapping

Name of the contributor(s): Laurea (Minna Fred & students: Kähäri & Vainio)

Time period when used in UDOI project: 9-12/2009

General idea of the method: Guided workshop designed to gather ideas and views for developing services to end-users. Compared to traditional workshops this method has visual approach, which means in practice creative visualization and concretization of ideas by using variety of tools such as drawing tools, construction and acting.

Case or research related details

Name of the case: MOFS Mobile ticketing

Description of the case where the method has been used:

The method was used to generate user ideas and gain understanding of user needs related to mobile ticketing in local public transport.

Product or service development stage:

Functional product or service	<input checked="" type="checkbox"/>
Non-functional prototypes	<input checked="" type="checkbox"/>
Early stages of the design process	<input checked="" type="checkbox"/>
Innovation, very early phase	<input checked="" type="checkbox"/>

Used human resources in this case (man-days):

1-5	<input type="checkbox"/>
6-10	<input checked="" type="checkbox"/>
11-20	<input type="checkbox"/>
more	<input type="checkbox"/>

Practical suitability (at this particular case, what was the support to casework):

Pros and Cons (at the case where used)

General comments

Human resource min. (Estimate. Needed from start of test planning to end of analyses)

1-5	<input type="checkbox"/>
6-10	<input checked="" type="checkbox"/>
11-20	<input type="checkbox"/>
more	<input type="checkbox"/>

Founded strengths of the method (Also estimate about validity and reliability if possible)

The strengths of the Context mapping method are the free form of expression and the documentation of ideas. It also provides the possibility to tailor the method for any service innovation. The tools used enable the participants to express also those ideas and thoughts that are difficult to present in oral or written form. The dialogue between participants and facilitators is important, not only because it allows flexibility between guided and free ideation (depending on the phase of the workshop and feedback/ideas of the participants) but by this method documentation is done by all stakeholders; participants and facilitators. Relaxed atmosphere is essential so that even "crazy ideas" can be easily expressed.

Founded weaknesses of the method (Also estimate about validity and reliability if possible)

The biggest challenge of Context mapping method is to design the content, so that participants understand the main idea so that they are able to participate actively in ideation. Context mapping is to be used in quite small groups so that the documentation of the process and outcome is easier.

When to use this method (recommendation, suitability in user driven open innovation work)

Context mapping method is easily applicable to all different stages of development as the content of the workshop is tailored. This method makes it possible to produce completely new ideas at early phase of innovation but it can also be used validate existing research data.

Notices (something else than above)

Appendix 3. Dialog cafe	
Method name: Dialog café	
Name of the contributor(s): Laurea (Minna Fred & students: Kuhmonen, Laima, Laine, Lapinkaira & Nikkanen)	
Time period when used in UDOI project: 09-12/2009	
General idea of the method:	
Dialog Café is designed to maximize discussion among people on a given topic. People compare their knowledge and own experiences, bringing different perspectives on the matter. In Dialog Café the participants are divided into small groups around a round table in order to promote discussion. As the dialogue progresses, members' seatings are mixed in order to enhance the debate and to keep the discussion alive.	
Case or research related details	
Name of the case: MOFS Mobile ticketing	
Description of the case where the method has been used:	
The method was used to generate user ideas and gain understanding of user needs related to mobile ticketing in local public transport.	
Product or service development stage:	
Functional product or service	<input type="checkbox"/>
Non-functional prototypes	<input type="checkbox"/>
Early stages of the design process	<input checked="" type="checkbox"/>
Innovation, very early phase	<input checked="" type="checkbox"/>
Used human resources in this case (man-days):	
1-5	<input type="checkbox"/>
6-10	<input checked="" type="checkbox"/>
11-20	<input type="checkbox"/>
more	<input type="checkbox"/>
Practical suitability (at this particular case, what was the support to case-work):	
Pros and Cons (at the case where used)	
General comments	
Human resource min. (Estimate. Needed from start of test planning to end of analyses)	
1-5	<input type="checkbox"/>
6-10	<input type="checkbox"/>
11-20	<input type="checkbox"/>
more	<input type="checkbox"/>

Founded strengths of the method (Also estimate about validity and reliability if possible)
Founded weaknesses of the method (Also estimate about validity and reliability if possible)
When to use this method (recommendation, suitability in user driven open innovation work)
<p>Dialog Cafe method is ideal for use in various events in order to collect more than one person's experiences and ideas. This method can be used for mapping user experience or discussing a specific topic for the purpose of educating people on the subject. The method can be used even when comparing or pointing out similarities and differences, or if the purpose is to get different perspective on the topic given.</p> <p>The method is especially suitable for use at an early stage yet it can be used throughout the innovation process.</p>
Notices (something else than above)

Appendix 4 Storytelling	
Method name: Storytelling	
Name of the contributor(s): Laurea (Minna Fred & students: Kuhmonen, Laima, Laine, Lapinkaira & Nikkanen)	
Time period when used in UDOI project: 9-12/2009	
General idea of the method:	
Storytelling is a method in which people are invited to describe their experiences in order to define their specific needs in the situation in question. People are invited to tell their ideas regardless of whether the case is even technically feasible, or whether it requests a device to function. By storytelling people can define their needs on the basis of rational arguments for a final determination.	
Case or research related details	
Name of the case: MoFS Mobile Ticketing	
Description of the case where the method has been used:	
The method was used to generate user ideas and gain understanding of user needs related to mobile ticketing in local public transport.	
Product or service development stage:	
Functional product or service	<input type="checkbox"/>
Non-functional prototypes	<input type="checkbox"/>
Early stages of the design process	<input type="checkbox"/>
Innovation, very early phase	<input checked="" type="checkbox"/>
Used human resources in this case (man-days):	
1-5	<input type="checkbox"/>
6-10	<input checked="" type="checkbox"/>
11-20	<input type="checkbox"/>
more	<input type="checkbox"/>
Practical suitability (at this particular case, what was the support to case-work):	
Storytelling was very profitable. The participants expressed openly their feelings and experiences of problems they had faced on the mobile payments.	
Pros and Cons (at the case where used)	
General comments	
Human resource min. (Estimate. Needed from start of test planning to end of analyses)	
1-5	
6-10	

11-20 more	x	
Founded strengths of the method (Also estimate about validity and reliability if possible)		
Founded weaknesses of the method (Also estimate about validity and reliability if possible)		
It is important to get people who have experience on the matter in question.		
When to use this method (recommendation, suitability in user driven open innovation work)		
The method can be used in various stages of the innovation process yet the results obtained from the storytelling are not necessarily tied in a certain stage of innovation. This method is not used in defining the requirements.		
Notices (something else than above)		

Appendix 5: Why-why-why method	
Method name: Why-why-why method	
Name of the contributor(s): Laurea (Minna Fred & students: Markus, Miettinen, Larikka, Nurmi & Nurmi)	
Time period when used in UDOI project: 9-12/2009	
General idea of the method:	
In Why-why-why method the question “why” is the most important one and it seeks to build a broad and productive discussion between the interviewer and interviewee. Behind the question is an attempt to build kind of a chain which relates to the topic. The interviewees need to think about their experiences from the past to the present day. Why-why-why the method can also be used to expand the interviewee's own knowledge about the matter when reasons for his/her eg. attitudes and behavior become evident through “why” questions.	
Case or research related details	
Name of the case: MOFS Mobile ticketing	
Description of the case where the method has been used:	
The method was used to generate user ideas and gain understanding of user needs related to mobile ticketing in local public transport.	
Product or service development stage:	
Functional product or service	<input checked="" type="checkbox"/>
Non-functional prototypes	<input type="checkbox"/>
Early stages of the design process	<input type="checkbox"/>
Innovation, very early phase	<input checked="" type="checkbox"/>
Used human resources in this case (man-days):	
1-5	<input type="checkbox"/>
6-10	<input type="checkbox"/>
11-20	<input checked="" type="checkbox"/>
more	<input type="checkbox"/>
Practical suitability (at this particular case, what was the support to case-work):	
By using Why-why-why method wider variety and depth of answers was obtained when compared to a standard interview which doesn't easily get beneath the surface of the answers.	
Pros and Cons (at the case where used)	
Some interviewees felt uneasy about the method.	
General comments	
Human resource min. (Estimate. Needed from start of test planning to end of	

analyses)	
1-5	
6-10	
11-20	
more	
Founded strengths of the method (Also estimate about validity and reliability if possible)	
Founded weaknesses of the method (Also estimate about validity and reliability if possible)	
When to use this method (recommendation, suitability in user driven open innovation work)	
The method is suitable to UDOI because it gathers the wishes, fears, ideas and thoughts, also negative ones of the interviewees. Number of interviewees and proper questions in addition to trustworthy atmosphere are issues that need consideration when using this method.	
Notices (something else than above)	

Appendix 6: Vox pops	
Method name: Vox pops	
Name of the contributor(s): Laurea (Minna Fred & students: Gulin, Lehtonen & Sihvonen)	
Time period when used in UDOI project: 9-12/2009	
General idea of the method: Vox pops is a service of design method, which aims to explore the widest possible sample of opinion on selected issue. The interviewees are selected at random. The interview consists of a single question which is the same for all interviewees.	
Case or research related details	
Name of the case: MOFS Mobile ticketing	
Description of the case where the method has been used:	
The method was used to generate user ideas and gain understanding of user needs related to mobile ticketing in local public transport.	
Product or service development stage:	
Functional product or service	<input checked="" type="checkbox"/>
Non-functional prototypes	<input checked="" type="checkbox"/>
Early stages of the design process	<input checked="" type="checkbox"/>
Innovation, very early phase	<input checked="" type="checkbox"/>
Used human resources in this case (man-days):	
1-5	<input checked="" type="checkbox"/>
6-10	<input type="checkbox"/>
11-20	<input type="checkbox"/>
more	<input type="checkbox"/>
Practical suitability (at this particular case, what was the support to case-work):	
The method is at its best when you are searching for innovative solutions at the ideation stage. Through a good sample (here 100 interviewees) it was easy to picture the general trend of subject studied. In our study a lot of ideas of different value added services were brought up by this method.	
Pros and Cons (at the case where used)	
When using the Vox pops method, the biggest challenge is to pose the right question which has to be easily understood and easy to answer.	
General comments	
Human resource min. (Estimate. Needed from start of test planning to end of analyses)	
1-5	

6-10 11-20 more	x 	
Founded strengths of the method (Also estimate about validity and reliability if possible)		
<p>The method's greatest strength is its rapid implementation phase. As the planning of the study is done and the right question is found, it is very quick to do the gathering of the data which is to pose the question to many people. Vox pops-style interview is also easy to answer as only one question is asked even though interviewees wouldn't otherwise have the motivation or time for a longer interview. Another important strength of the method is the formation of the target group and finding it with ease.</p>		
Founded weaknesses of the method (Also estimate about validity and reliability if possible)		
When to use this method (recommendation, suitability in user driven open innovation work)		
<p>This method is very suitable for UDOI work: besides the ideation stage, this method is good for testing products and services in all stages of innovation process because of the immediate feedback from user.</p>		
Notices (something else than above)		

Appendix 7: UDOI poster

UDOI

User Driven Open Innovation

Flexible Services

Usage of user generated data in product and service development

The classification of corporate R & D flexibility model developed based on cases and interviews on the participating companies


- ◆ The classification not imply superiority or even company's need for the development from one section to another towards UDOI action model
- ◆ Designed to help companies to elaborate their status quo and what is important in the co-operation with end-users

	Technology driven (TD)	User centric (UC)	User driven (UD)
Open (O)	OTD	OCU	ODU
Closed (C)	CTD	CCU	CDU

Degree of involvement

Changes needed for implementing UDOI processes

- ◆ Corporate R & D processes from undefined, ad hoc product development processes to UDOI-scale development processes
- ◆ Investment in product and service development process and leadership required
- ◆ Investments not only economical or personnel resources
- ◆ Companies need to build their operations that the usage of user knowledge is possible



Converting product and service development process towards UDOI-model

- ◆ UDOI-approach most suitable for companies that already taken up customer-focused product and service development practices
- ◆ Mind-set change from 'I'll take and use' -approach to 'I'll take and I will give'
- ◆ Customer and user integration in business operations closer to the market
- ◆ The company should synchronize its operations with a customer community

The key factors for successful UDOI-case

- ◆ The strategic importance of the project to the company
- ◆ Company's internal involvement in the project
- ◆ Both short-term and long-term goals
- ◆ Clearly expressed objectives and benefits to all stakeholders of the project
- ◆ Ability to co-operate with customers

Understanding customers is crucial for contemporary firms' business and innovation activity.

Integrating customers and users in the innovation process to learn from and with them has become attractive for companies in all industries. But many companies lack understanding of when and how to appeal and involve users in the innovation process.

This study focuses on user-involvement in living labs which represent the ever more popular open innovation model. Living labs are physical regions or virtual realities where stakeholders have formed public-private-people partnerships for creation, prototyping, validating and testing of new technologies, products, services, and systems in real-life contexts.

The study elaborates a firm's interaction and co-creation with users via three case studies. It presents a classification of user-involvement, which takes into consideration the starting point for product development. Collaboration is technology-driven, user-centered, or user-driven.

The findings suggest that users' role in a company's product and service development can be visualized as a metaphor of a "row of teeth", in which co-operation is sought to describe the company's responsibility and regularity of operations with the user.

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