

USER-LED INNOVATION

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ABSTRACT

This chapter features the important role of users in the process of innovation. In the innovation process users can be sources of ideas, products and services as they are able to assess to their problems and needs. Moreover, this chapter introduces various tools for involving users in innovation process: free revealing through open source software and co-creation process through Living Lab methodology. The chapter is complemented by additional sources for readings, pedagogical guidelines, evaluation questions and teaching tips.

Prerequisite	Generic knowledge of organizational theory and innovation management.
Objective of the lecture	This module consists of 3 sub-modules aiming at: 1. General understanding of user-led innovation; 2. Providing insights into free revealing and open source software; 3. Providing knowledge on industrial networks and practical examples of innovation-driven collaboration within (or between) these networks.
Workload	4-6h teaching; 4 h self-study (2h/sub-module).
Learning outcomes	<p>Knowledge</p> <p>LO #2: To explore concepts of collaborative innovation and apply them.</p> <p>LO #115: To remember and understand the basic concepts of OI and their relationships.</p> <p>LO #90: To understand the dynamics between innovation and the contextual environment.</p> <p>LO #117: To remember and understand how firms can benefit from user/supplier/customer innovation.</p> <p>Skills</p> <p>LO #99: To understand and assess networks and collaboration networks.</p> <p>Competences</p> <p>LO #64: To apply, analyse, evaluate and design strategic decision making with regard to the implementation of relevant open innovation mechanisms in the organisation.</p>
Reading List	<p>Users as sources of new ideas (von Hippel 1988, DIUS 2008)</p> <p>Users' involvement in changing products (von Hippel 1988, von Hippel 2005, NESTA 2007a)</p> <p>Users' involvement in changing services (von Hippel 2005, NESTA 2007a)</p> <p>Users' involvement in changing processes (von Hippel 1988, 2005, NESTA 2007a)</p> <p>Users' involvement in changing systems (von Hippel 2007)</p>

	Free revealing and Open Source Software (von Krogh, Spaeth & Lakhani, 2003; von Hippel & von Krogh 2006) ENoLL website Ståhlbröst and Holst (2012) The Living Lab Methodology handbook
European Qualifications Framework (EQF) Level	Levels 6, 7

LECTURE CONTENT

User-led innovation

User-led innovation is a concept used in creating various innovative products and services through user involvement within different industries. Involving users in the innovation process in order to assess to their problems and needs can help develop potential and successful future products. This goes for SMEs as well as large companies. The sophisticated and expensive innovation process makes it almost impossible for firms to innovate independently and alone. Therefore, including users in the innovation process enables firms to bring ideas and knowledge from outside into the firm (Bisgaard & Høgenhaven 2010).

To date, firms have become more dependent on the consumers, and user-led innovation increasingly become popular among firms. For example, Linux has created a path to connect individuals from all around the world to engage in projects of interest to them.

The users may have different roles in the innovation process. For example, Gristock (2008) has identified the following categories (definitions will follow):

- Users as sources of ideas:

The ability of firms to engage users in the initial phases of idea generation. Example: idea bank.

- Users changing products:

Firms utilize user experiences to extend the range of products or incrementally to innovate a product to satisfy consumers' needs.

- Users changing services:

Firms utilize user experiences to extend the range of services or add an innovate service to satisfy consumers' needs.

- Users interacting via open systems:

In the open systems, the users interact and share perspectives, and organisations can benefit from the users' insights and feedback in order to serve them with relevant outcomes.

- The roles of users and open systems in democratic innovation systems:

Users of products and services – both firms and individual consumers – are increasingly able to innovate for themselves. User-centered innovation processes through democratized innovation systems occur at two levels: 1) steadily improving design capabilities (innovation toolkits); and (2) steadily improving ability of individual users to combine and coordinate their innovation-related efforts via new communication media, such as the Internet (von Hippel, 2005).

Free revealing and Open Source Software

Among the tenants of Open Innovation there is free revealing (von Hippel & von Krogh 2006; Henkel, 2006). With free revealing we mean that “all intellectual property rights to [proprietary] information are voluntarily given up by that innovator and all parties are given equal access to it – the information becomes a public good” (von Hippel & von Krogh, 2006: 295). The key questions in free revealing are about “why do people free-reveal” and “who benefits from free revealing”. For example, users who free-reveal may be motivated by obtaining support from a user community or a manufacturer and building reputation (Henkel, 2006).

An example of free revealing can be seen in the Open Source Software projects. Open Source Software (OSS) is “software that comes with source code and a usage license that allows for modification and further redistribution of the source code by any user” (von Krogh, Spaeth & Lakhani, 2003: 1217).

An introduction on OSS may be based upon von Krogh and von Hippel (2006), who distinguish between three main areas: (1) motivation; (2) governance, organisation and the process of innovation; and (3) competitive dynamics. We suggest a cycle of lessons divided accordingly. See von Krogh and von Hippel (2006), for a broad list of contributions on each of the three topics.

Finally, we can move a step further via looking at why commercial firms take part in public OSS development (Henkel, 2006; 2008), via exploring the role of open source developers in commercial firms (Henkel, 2008) and via analysing the heterogeneity of firms when they reveal information (Henkel, 2006).

Activity 1. Find examples of OSS and compare them. We suggest comparing successful and not successful examples in order to understand why some OSSs have been successful and others have not.

Activity 2. Brainstorming about why and when to use free revealing. The teacher may ask the students to list the pros and cons of free revealing to understand under which conditions it may be worthy to free-reveal or not.

Living Labs

Several definitions have been provided for living labs. Among the most commonly used, we can cite the definition of Westerlund and Leminen (2011), who define living labs as: “physical regions or vir-

tual realities, or interaction spaces, in which stakeholders form public-private-people partnerships (4Ps) of companies, public agencies, universities, users, and other stakeholders, all collaborating for creation, prototyping, validating, and testing of new technologies, services, products, and systems in real-life contexts”. Others have defined a living lab as an organised approach to innovation, consisting of real-life experimentation and active user involvement (Schuurman, 2015).

An overview of living lab definitions found in the literature and used in practice is offered by Dell’Era and Landoni (2014). The main elements of these definitions are the living lab methodology (and tools) and the infrastructure (or ecosystem) to put this methodology into action. Hence they define a living lab as a design research methodology aimed at co-creating innovation through the involvement of aware users in a real-life setting.

Living labs can be seen as a collaborative constellation and methodology for cooperative and participative research and design. The tradition of participative research and design goes back to the middle of the 20th century when end-users took a part in trials of novel products and technology. In the following decades, various approaches have been developed to involve users in research and design, in some cases in real-life settings and using multiple approaches. Robles, Hirvikoski, Schuurman, & Stokes (2015) describe four former approaches of the living lab methodology and their main characteristics.

	Cooperative design 1970's	Social experiments 1980's	Digital cities 1990's	Home labs 2000's
Active user involvement	+	+/-	-	-
Real-life setting	+	+	+/-	+/-
Multi-stakeholder	+/-	+	+	-
Multi-method approach	+/-	+	-	+/-
Co-creation	+	+/-	-	-

Figure 1. History of participative research and design (Robles, Hirvikoski, Schuurman, & Stokes, 2015)

Schuurman (2015) has developed a three-layer model for living labs describing three levels of analysis: macro-level (the living lab constellation or infrastructure), meso-level (the living lab innovation project) and micro-level (dealing with the methodology and process within a specific project).

- openness of interaction with users (open or closed);
- role of the methodology/platform technology (value creation or value capturing).

The configuration of open and explorative living labs is most suited for the opportunity identification phase. In this type of living lab, new research and design tools and technologies are introduced

Dell'Era and Landoni (2014) describe a living lab as a methodology between user-centred design and participatory design, and identify four different specifications for this methodology based on the combination of two dimensions:

Level	Definition	Research paradigm
Macro	Living Lab constellation consisting of organized stakeholders (PPP-partnership)	Open Innovation: knowledge transfers between organizations
Meso	Living Lab innovation project with Living Lab methodology	Open & User Innovation: real life experimentation, active user involvement, multi-method and multi-stakeholder
Micro	Individual research steps and activities, linked to the stakeholders' assets and capabilities	User Innovation: user involvement & contribution for innovation

Figure 2. Three levels of analysis (Schuurman, 2015)

to a diverse and non-moderated pool of users who provide feedback on the research questions and input for the design stage. The type of open and exploitative living lab focuses on the concept generation phase.

The more closed configurations of living labs (both explorative and exploitative) are based on collaboration with a group of pre-selected users and other stakeholders and offer conditions that facilitate concept design and market testing. These processes, aiming at convergence instead of divergence carry higher costs in selecting users and require limited access to the experimental setting of the lab.

Schuurman, De Marez and Ballon (2016) stress the need for both open and closed innovation approaches and balancing these approaches in living lab practices.

The living lab methodology implies triangulation of different methods and information sources in combination with a real-life context. Pierson and Lievens (2005) describe five different stages of the living lab methodology: (1) contextualisation, (2) selection, (3) concretisation, (4) implementation, and (5) feedback. Ståhlbröst and Holst (2012) describe FormIT as a specific method to support living labs. This method is based on three iterative cycles: (1) concept design, (2) prototype design, and (3) innovation design.

Bergvall-Kåreborn, Ihlström Eriksson, Ståhlbröst, and Svensson, (2009) describe five principles that are the key for living labs. These principles are openness, continuity, empowerment of users, realism, and spontaneity. These principles should be taken into account in the design and organisation of a living lab and the innovation process. The key principle of openness regards the involvement of

stakeholders that possess varying perspectives, knowledge and expertise. The partners bringing different skills and competences are expected to strengthen the knowledge base of the living lab, hereby enabling rapid progress in the innovation process. Practicing openness, living labs aim at enhancing the pace and time to market of the innovation process. Therefore, collaboration in living labs should involve stakeholders that have diverse perspectives and expertise.

KEY TAKE-AWAYS

- User-centric innovation helps companies to bring ideas and knowledge from outside into the firm.
- The involvement of users can be stretched beyond activities focused on need assessment and test panels. The Living Lab methodology is aimed at co-creating innovation through the involvement of aware users in a real-life setting.
- An example of free revealing can be seen in the Open Source Software.

PRACTICAL IMPLICATIONS

The methodology and infrastructure of living labs can support the identification of the (latent) needs and values of relevant users and stakeholders and facilitate collaboration between these stakeholders in the design, prototyping, evaluation and commercialisation of innovative products and services.

Despite the benefits and positive outcomes of the living lab approach, involving users and other relevant stakeholders in open innovation is not easy and will require an additional budget. It requires extensive preparations and continuous attention to the leading principles of living labs: openness, continuity, empowerment of users, realism, and spontaneity. Involving multiple stakeholders will in many cases require investments in physical and/or virtual meeting places and IT-supported communities. In addition to the initial investments in IT, the living lab communities will require close moderation, resulting in additional costs. The empowerment of users can be established by various 'appraisal and reward systems' that in some cases require additional funding.

Various organisations offer services and tools that facilitate the design and exploitation of living labs. These services and tools vary from generic guidelines and practical do's and don'ts to advanced IT-platforms and toolkits to facilitate multi-stakeholder collaboration.

The European Network of Living Labs (ENoLL) offers a wide range of publications and case studies that describe how the concept of living labs has been put into practice in various contexts.

ADDITIONAL READING MATERIALS FOR STUDENTS

Examples of Open Source Software

- Apache (Lakhani & von Hippel, 2003)
- Freenet project (von Krogh, Spaeth & Lakhani, 2003)
- Toolkits (von Hippel & Katz, 2002)
- Pyramiding and screening (Schuurman, De Marez & Ballon, 2016)

Examples of Living Labs

- The Technology Innovation Management Review (TIM Review) provides insightful content about the concept of living labs. The journal offers both theoretical contributions and case studies describing innovation projects in practice.

PEDAGOGICAL GUIDELINES

The lecture consists of a frontal lecture and interactive activities. After 2 hours of frontal teaching for each sub topic, the participants will be divided into groups in order to find examples of user-led innovations in their network. They should analyse and evaluate those innovations and present their cases and analysis to other groups.

The concept of Living Labs is difficult to understand for bachelor business students and for technology students in general. Their understanding of industry is primarily based on and driven by the perspective of the individual firm.

Teaching the concept of Living Labs requires the use of (in depth) case study materials. Master's and PhD students should be able to deal with the suggested reading materials by themselves but could use additional frontal teaching and case materials.

EVALUATION QUESTIONS

Individual work examples

- Could you find examples of user-led innovation around you? What was the process of users' engagement? What possible challenges did you observe? What can be done better? Do you know any famous company that innovates by users' ideas? What are the different ways of users' engagement?
- What is a living lab? How does this relate to other research and design methodologies? What are the core elements and principles of the living lab methodology? How can an individual company benefit from the living lab methodology?

Group work examples

- Why did you choose this case? Can you present a summary of the evaluation? Do you think this is a success story? How can users make this even better?
- Select a living lab and collect data on the infrastructure and multi-stakeholder collaboration. Prepare a report that deals with the questions described above and how open innovation in this network could be improved.

TEACHING TIPS

Links to teaching material

- Part of the materials provided by Antero Kutvonen (LUT) on the OI-Net platform could be used
- Link to the European Network of Living Labs: www.openlivinglabs.eu
- <http://www.slideshare.net/openlivinglabs/introducing-living-labs-and-enoll-41742410>
- An introduction to living labs: <https://www.google.nl/url?sa=t&rct=j&q=&esrc=s&source=web&cd=5&cad=rja&uact=8&ved=0ahUKEwi0sfHHgKrMAhWhCsAKHXsmCb8QFgg9MAQ&url=https%3A%2F%2Fwww-sop.inria.fr%2Faxis%2FIUL%2Fintroduction-2007.ppt&usg=AFQjCNHkoTXFYIvsZWA8c6h-XTDUW9tftpw&bvm=bv.119745492,d.bGs>

Supporting case materials

- Various case studies and best practices can be found at: www.openlivinglabs.eu
- Additional case material (videos) can be found at <https://vimeo.com/openlivinglabs>
- Exploring the future of Living Labs, Eindhoven University of Technology, <http://www.tue-lighthouse.nl/Images/Livinglabs/20160210%20Exploring%20the%20future%20or%20Living%20Labs%20-%20LR%20ebook.pdf>.

ADDITIONAL READING

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