

Introducing User Typologies to Optimise Living Lab-Approaches for ICT-Innovation

Dimitri Schuurman¹1111, Katrien De Moor¹, Lieven De Marez¹

¹*IBBT-MICT, Ghent University, Korte Meer 7-9-11, 9000 Gent, Belgium,
{dimitri.schuurman,katrienr.demoor,lieven.demarez}@ugent.be*

Abstract

Our contemporary ICT-environment is characterized by an innovation spiral, resulting in a lot of innovations as well as failures. Attempts to cope with the inherent uncertainty and increasing complexity in the field of ICT-innovation have influenced the rise of new, user-driven and open innovation-approaches. We contend that the Living Lab-approach can be seen as a systemic, methodological instrument incorporating a number of crucial insights linked to advances in the innovation management and user research-literature, especially in the increased importance of the user. Currently however, the literature dealing with the ‘user’ as key stakeholder in the innovation process is still fragmented. Within this positioning paper, we will contend that taking into account different user roles, associated to the ICT-innovation in development, can optimize Living Lab-approaches.

Keywords

Living Labs, ICT-innovation, user roles, Lead Users, domestication

1 Introduction

Within our contemporary ICT-environment, companies have ended up in a so-called ‘innovation spiral’. Because of a far-reaching globalization, growing competition and convergence, more and more innovations come to the market. At the same time, more and more of these innovations fail to reach the mass market. Consumers perceive these (often merely incremental) innovations as less innovative and are less willing to adopt as they often have a ‘too much, too soon’-feeling (Slater, Mohr, 2006), (De Marez, 2006). However, we believe an innovation can only be considered as successful when it also gets incorporated into the everyday life of the users (Haddon, 2006), (Silverstone, Haddon, 1996). In other words, the domestication or use diffusion process must also be successful, something which is sometimes overlooked in ICT-innovation strategies (cf. e.g. Berte, et al., 2010). This makes the need for more user-driven and user-led innovation strategies even more apparent amongst companies (Ståhlbröst, Bergvall-Kåreborn, 2008). In order to stand out and attract attention, they need to take users’ expectations, experiences and needs into account (Pierson, et al. 2006). However, an important question remains: how can this user involvement best be put in practice in order to maximize the chances of a successful adoption and use diffusion? Edelman (et al. 2006) sees a triple play of business – users – technology necessary to optimize the innovation process. Hoogma & Schot (2001) argue that user innovativeness depends on the learning environment that is created in the innovation process, so they add the environment in which the user interacts with the innovation as an important factor. Slater & Mohr (2006) argue for the blending of insights from market strategy with those from innovation management in order to come to successful innovations. We believe that the ‘blending’ of these insights has resulted in the Living Lab-concept, a state-of-the-art research methodology aimed at involving the user within the innovation process, taking into account most of the listed issues. In practice however, ‘the user’ is all too often seen as a supposedly well-known archetype. Due to this simplification, companies are unable to grasp the complex interactions between products, users (and their different roles) and the multiple contexts

in which these products are used. In this positioning paper, it is therefore argued that there are different and possible user typologies that should be taken into account when looking for a successful way of involving users within the innovation process, and that incorporating these user roles can optimize Living Lab innovation processes, especially in the case of ICT-innovation, and maximize the successful adoption and use diffusion of the innovation.

2 Living Labs as state-of-the-art methodology for ICT-innovation

The term 'Living Lab' is used to describe an experimental platform where the user is studied in his or her everyday habitat while testing new technologies that are still in development. A combination of research methodologies is applied with the focus on accessing the ideas and knowledge of the users (Erikkson et al., 2006). These Living Labs are mostly established through collaboration of private as well as public research partners and can be used with multiple iterations throughout different stages of the innovation process with users being utilized throughout multiple stadia of the new product or service development (Schaffers et al., 2007), (Erikkson et al., 2005). This links Living Labs to the 'open innovation' perspective, where innovation is seen as a non-linear and open process with cooperation and collaboration between different stakeholders (Chesbrough, 2003). Erikkson (et al., 2005) states that Living Labs could function as a means to meet the innovation challenges of ICT-providers.

Følstad (2008) identified nine characteristics for Living Labs in the context of ICT-innovation, which can be considered as the best attempt to conceptualize the elements of Living Labs: 1. Research into the usage context; 2. Discover unexpected ICT-uses and new service opportunities; 3. Co-creation with the users; 4. Evaluation of new ICT-solutions by users; 5. Technical testing of the innovation in a realistic context; 6. Familiar usage context for the users; 7. Experience and experiment in a real-world context; 8. Medium- or long-term user studies; 9. Large scale user studies. However, Følstad also found that only four of these characteristics occurred in all of the studied Living Lab-approaches: 2, 4, 6 & 8. This proves that there still exists a certain conceptual ambiguity with regards to the concrete application of the Living Lab-concept (Schuurman, De Marez, 2009).

3 User typologies & conceptualizations

We will now present some possible user conceptualizations that we believe might optimize Living Lab-approaches. The first user typology comes from a major paradigm to study innovation: the 'adoption diffusion'-perspective with as central premise that the different adopter categories each show their own unique characteristics (Rogers, 2003). Within a Living Lab-setting, visionaries (earlier adopters) as well as pragmatists (later adopters) should be included in order to tailor the innovation towards the needs and wants of both groups. The visionaries seem better suited for the earlier stages of the Living Lab, as they are by definition more open to innovation and can better serve as creative input sources (e.g. 'co-creation with the users'-stages), while the pragmatists should be used in later stages (e.g. 'evaluation of ICT-solutions by users'). Methods exist to predict the adopter segments (cf. e.g. De Marez, 2006) and should be used throughout the NPD-process to get an idea of the market potential of the innovation.

A second paradigm reacted against the supposed technological determinism of the AD-perspective and stressed the shaping of an ICT-innovation by social factors: 'domestication' (Haddon, 2006), (Silverstone, Haddon, 1996). The study of the 'use diffusion' was initially based on a social deterministic point of view and mostly limited itself to descriptive qualitative research. However, Shih & Venkatesh (2004) propose a user categorization based on quantitative research into use diffusion which might be used in Living Lab-settings. When an innovation can be used by a large enough user group, measures regarding usage intensity and usage diversity

can be obtained, allowing to categorize them and gain further information regarding the use diffusion of the innovation.

A number of authors have already discussed the involvement of another user type in Living Lab-research: Lead Users. Lead Users display two main characteristics with respect to an innovation: a) Lead Users face needs months or years before they will be general in a marketplace and b) Lead Users expect to benefit significantly by obtaining a solution to these needs (von Hippel, 1986). Urban & von Hippel (1988) state that Lead Users are especially relevant when new product needs are evolving rapidly, as is the case for ICT. Eriksson et al. (2005) explicitly argue for a better integration of Lead User-theory within Living Lab-approaches. Almirall (2008) suggests that Lead Users are more willing to participate within Living Lab-research because they are motivated to be involved, while Kusiak (2007) explicitly mentions the use of Lead Users in two stages of the ICT-innovation process: idea generation and concept evaluation. This coincides with Følstad's 'co-creation with the users'- and 'evaluation of ICT-solutions by users'-stages.

Other interesting typologies that are associated with ICT-innovation are e.g. the so-called 'Pro-Ams' (Leadbeater & Miller, 2004), these users are innovative, committed and networked amateurs that work to professional standards, 'Outlaw users' or simply 'outlaws' (Flowers, 2008), these are Pro-Ams that use their advanced knowledge of games or other software in order to bypass legal or technical safeguards that prevent users from unsolicited usage of the manufacturer's product, and Bystanders, users that are exposed to a given technology and its outputs but are not intended to react or respond to this (Ferneley, Light, 2006).

4 Conclusion

Within this positioning paper, we have argued that user conceptualization within Living Lab-approaches remains rather limited until today. As the Living Lab-approach unites and allows research into the adoption diffusion and use diffusion (domestication)-perspective, we proposed enriching Living Lab-processes with the related user typologies: the adoption diffusion segments and the use diffusion segments. Other typologies such as Lead Users, power users, bystanders, and outlaw users might also provide additional value when taken into account during specific stages within a Living Lab innovation process. These user typologies allow for purposeful sampling for user involvement in Living Lab-contexts and for specific types of user input associated with different stages in the Living Lab-process. However, more research into the concrete application and identification of these user typologies is needed. We are currently preparing some case studies in which we will try to show the added value of this targeted approach over simply involving 'the user' in Living Labs.

References

- Almirall, E. (2008). "Living Labs and open innovation: roles and applicability", *The Electronic Journal for Virtual Organizations and Networks*. 10, 21-26.
- Berte, K., Schuurman, D., De Marez, L. (2010). Adoption versus use diffusion of iDTV in Flanders - Personalized television content as a tool to cross the chasm? *Proceedings of EuroITV2010*, 9-11/06, Tampere, Finland.
- Chesbrough, H. (2003). *Open Innovation. The New Imperative for Creating and Profiting from Technology*. Harvard Business School Press, Boston.
- De Marez, L. (2006). *Diffusie van ICT-innovaties: accurater gebruikersinzicht voor betere introductie-strategieën*. Doctoral thesis, Gent: Universiteit Gent.
- Dirckinck-Holmfeld, L. & Ryberg, T. (2005). "Power Users of Information and Communication Technology – an emerging research agenda", In J. Malyn-Smith & C. Parker (Eds.). *Power Users of Technology Symposium*, August 6-11th, San José, Costa Rica.
- Edelmann, J., J. Koivuniemi, F. Hacklin, R. Stevens (2006). "New perspectives on mobile service development", in: J. Müller, B. Preissl (Eds.), *Governance of Communication Networks: Connecting Societies and Markets with IT*, Physica (Springer), Heidelberg, 2006, pp. 295–308.

- Eriksson, M., Niitamo, V.P. and Kulkki, S. (2005). State-of-the-art in utilizing Living Labs approach to user-centric ICT-innovation - a European approach. White paper:[http://www.vinnova.se/upload/dokument/ Verksamhet/TITA/Stateoftheart_LivingLabs_Eriksson2005.pdf](http://www.vinnova.se/upload/dokument/Verksamhet/TITA/Stateoftheart_LivingLabs_Eriksson2005.pdf)
- Eriksson, M., Niitamo, V.-P., Kulkki, S. and Hribernik, K.A. (2006). "Living Labs as a Multi-Contextual R&D Methodology", ICE 2006. Milan, Italy, June 26-28.
- Ferneley, E.H. & Light, B. (2006). "Secondary User Relations in Emerging Mobile Computing Environments", *European Journal of Information Systems* 15(3): 301–306.
- Flowers, S. (2008). "Harnessing the hackers: The emergence and exploitation of Outlaw Innovation", *Research Policy*, Vol. 37, No. 2, pp.177-193.
- Følstad, A. (2008). "Living Labs for Innovation and Development of Communication Technology: A Literature Review", *The Electronic Journal for Virtual Organisations and Networks*, 10, 99-131.
- Frissen, V., & Van Lieshout, M. (2006). "ICT and everyday life: The role of the user", In: Verbeek, P., & Slob, A. (eds.) *Technology, Behavior and the Environment, a multidisciplinary approach*. Dordrecht: Kluwer.
- Haddon, L. (2006). "The contribution of domestication research to in-home computing and media consumption", *The Information Society*, 22 (4), 195-204.
- Haddon, L. & Paul, G. (2001). "Design in the ICT industry: the role of users", in R. Coombs K. Green & V. Walsh (Eds.) *Technology and the market:demand, users and innovation*. Cheltenham: Edward elgar Publishing.
- Hoogma, R., Schot, J. (2001). "How innovative are users? A critique of learning-by-doing-and-using", In Coombs, R., Green, K., Richards, A., Walsh, V. (Eds.), *Technology and the Market: Demand, Users and Innovation*. Edward Elgar Publishing, Cheltenham: 216–233.
- Kusiak, A. (2007). "Innovation: The Living Laboratory Perspective", *Computer-Aided Design & Applications*. 4 (6), 863-876.
- Leadbeater & Miller, (2004). *The Pro-Am revolution: How enthusiasts are changing our economy and society*. London: Demos.
- Malyn-Smith, J. (2004). "Power Users of Technology - Who are they? Where are they going? Why does it matter?", *UN Chronicle*, 58-61.
- Niitamo, V., Kulkki, S., Eriksson, M. and Hribernik, K.A. (2006). "State-of-the-art and good practice in the field of Living Labs", *Proceedings of the 12th International Conference on Concurrent Enterprising: Innovative Products and Services through Collaborative Networks*, Milan, Italy, p.349-357.
- Pierson, J., Jacobs, A., Dressen, K., Lievens, B. & Van Den Broeck, W. (2006). "Walking the interface: uncovering practices through 'proxy technology assessment'", in proceedings of EPIC 2006, September 24-26, Portland OR.
- Rogers, E. 2003. *Diffusion of innovations* (5th ed.). New York: The Free Press.
- Schaffers, H., Cordoba, M.G., Hongisto, P., Kallai, T., Merz, C. and Van Rensburg, J. (2007). "Exploring business models for open innovation in rural Living Labs", Paper presented at 13th International Conference on Concurrent Enterprising, Sophia-Antipolis, France, 4-6 June 2007.
- Schuurman, D. & De Marez, L. (2009). "User-Centered Innovation: Towards a Conceptual Integration of Lead Users and Living Labs", In: *Proceedings of COST298-conference The Good, The Bad and The Challenging*, 13-15/05, Copenhagen, Denmark.
- Shih, C. & Venkatesh, A. (2004). "Beyond Adoption: Development and Application of a Use-Diffusion Model", *Journal of Marketing* (68), 59-72.
- Silverstone, R. and Haddon, L. 1996. "Design and domestication of information and communication technologies: technical change and everyday life", In: Silverstone, R. & Mansell, R (Eds.), *Communication by design. The politics of information and communication technologies*. Oxford: Oxford University Press.
- Slater, S.F. and Mohr, J.J. (2006). "Successful Development and Commercialization of Technological Innovation: Insights Based on Strategy Type", *Journal of Product Innovation Management* 23(1):26–33.
- Ståhlbröst, A. & Bergvall-Kåreborn, B. (2008). "Constructing Representations of Users Needs - A Living Lab Approach", *Proceedings of IRIS31*, 10-13 August, Åre, Sweden.
- Urban, G. & von Hippel, E. (1988). "Lead User analyses for the development of new industrial products", *Management Science*, 35: 569-582.
- von Hippel, E. (1986). "Lead Users: A Source of Novel Product Concepts", *Management Science*,(32) 7, pp. 791-805.