Stakeholders in Smart City Living Lab Processes

Full Papers

Anna Ståhlbröst
Luleå University of Technology
Anna.stahlbrost@ltu.se

Birgitta Bergvall-Kåreborn
Luleå University of Technology
Birgitta.bergvall-kareborn@ltu.se

Carina Ihlström Eriksson
Halmstad University
Carina.ihlstrom_eriksson@hh.se

Abstract

Due to the increasing urbanization around the world, cities are growing at fast pace and following that, many cities face problems that includes both hard and soft issues. This can for instance be transportation, energy suppliance, social inclusion and quality of life for its citizens. As a way to contribute to solving these problems the smart city concept has emerged. This concept is focusing on capitalizing on ICT landscape in a strategic way. To achieve a smart city it is important to start with understanding the people and their needs, which can be supported by a Living Lab. These Living Lab involve a multitude of stakeholders in their innovation processes and thus, it becomes important to understand the power dependencies, claims and roles these stakeholders have. Thus, the aim of this   paper is to explores the stakeholders that are involved in smart city innovation processes supported by Living Lab

Keywords

Living Lab, smart cities, stakeholders, digital innovation

Introduction

One common view of cities is that they are the driving force behind the creativity and innovations and historically, this has been the case with literature, art and architecture. Also contemporary cities are major contributors and requesters of innovations, which are the primary sources of economic, and employment growth (Dodgson & Gann, 2011). The current urbanization with city populations that is accounted to be more than 60% of the worlds population by 2030 (Jungwoo and Hyejung 2014) is a major stimuli for innovations. These growing cities needs to become smarter in order to answer to the needs of their citizens, to become more efficient and to handle the cities increasing growth both in population and in geographical distance (Angelidou 2014). Hence, issues such as transportations, waste management, energy management as well as issues such as social inclusion, quality of life and wellness are becoming increasingly important to manage for cities (Neirotti et al. 2014). This puts high demands on these cities to be innovative and also to include more stakeholders in their innovation processes to develop solutions that answer to their stakeholders diversified needs (Angelidou 2014). To become a smart city it is of vital importance to start with the people and the human side of the equation instead of "*blindly believing that IT in itself can automatically transform and improve cities*" (Hollands 2008, p.315). One definition of smart cities is that a city to be smart when investments in human and social capital and traditional (transport) and modern (ICT) communication infrastructure fuel sustainable economic growth and a high quality of life, with a wise management of natural resources, through participatory government (Caragliu et al. 2011).

Around the world, there is a concept called Living Labs (LL) growing at fast pace with over 400 active Living Labs today. These LLs has the overarching purpose of supporting user-centered innovation processes for different types of clients and stakeholders (e.g. cities) in real world contexts (Almirall and Wareham 2011). One approach for cities to accomplish more open and people centred innovation processes is to work with these LL that focus on supporting them in their process of making use of external ideas (Sieg et al. 2010). LLs have the potential to increase the research and innovation capacity for their clients by offering a somewhat neutral meeting place where different competencies can collaborate in a trusted environment (Niitamo et al. 2012; Ståhlbröst 2013). Having an innovation process that aims at being open require an open dialogue and a focus on building relationships between those involved in the process (Gould 2012). Within the LL area there is a desire to reap the benefits of open collaboration, while at the same time balance the different interests and intentions among these stakeholder (Leminen and Westerlund 2012; Ståhlbröst 2013). This is not always an easy task since it might create conflict between different stakeholders and their intentions, and its also includes risks such as loosing the very fruits of their collaborative efforts (Love et al. 2011). In these processes, sensitive information related to an innovation can be revealed among the stakeholders, which gives a complex web of relations and dependencies. These relations need to be understood and managed by the LL to decrease the probability of unintended leakage of ideas and innovations within and beyond the LL and the cities boundaries. Thus it is of vital interest to understand how different stakeholders collaborate in these contexts by understanding their characteristics and the interest of these stakeholders. Based on that, the purpose of this paper is to identify and explore the relationship between the stakeholders and the LL through an understanding of their roles in LL activities.

Understanding Stakeholders and Their Roles

According to Nyström, et al. (2014), LLs offer a fruitful architecture for deploying open innovation and they could be understood as a type of innovation networks. In this paper, we will investigate the LL stakeholder's activities, dependencies and basis for legitimacy. To support our efforts, a stakeholder theory is used as a theoretical lens to gain further understanding of the involved stakeholders. Freeman, being one of the founders of stakeholder theory, found that the role of the stakeholders' relationship with an organization was an important relationship to understand for organizations (Freeman 1984). He define stakeholders as "any group or individual who can affect or is affected by the achievement of the organization's objective" (1984, p.46) . In recent research, stakeholders have been categorized into primary and secondary stakeholders where primary stakeholders include groups such as communities, customers, employees, suppliers, and financers; and secondary stakeholders include groups such as government, competitors, consumer advocate groups, social-interest groups, and media (Gould 2012). Based on this theory the fundamental question becomes, which groups or individuals are stakeholders deserving or requiring the LL managers attention, and which are not? This is important since managers need to understand the stakeholders in order to strengthen their organizational processes (Laplume et al. 2008).

A stakeholder can, according to Mitchell, Agle and Wood (2011), take many forms; it can be a person, groups, neighborhoods, organizations, institutions, societies, and also the natural environment. In addition, related to the notion of stakeholders, the term stake becomes important. Who has something at stake and what do they have at stake? To clarify the term, we need to differentiate between groups that have a legal, moral or presumed claim on the organization, and groups that might have an ability to influence the organizations' behavior, direction, process, or outcomes (Mitchell et al. 1997), In addition, some stakeholders have no power, but they are still important for the organization.

In this paper, we take a broad view of stakeholders to be able to recognize and respond effectively to the heterogeneous group that may or may not have legitimate claims, but who may be able to affect, or are affected by the LL´s activities nonetheless, and therefore have an impact on the interests of those who do have legitimate claims. This can for instance be end-users and affectees involved in the innovation processes.

Mitchell, Agle and Wood (1997) have identified a number of rationales that support the identification of stakeholders for an organization. In this paper, we have made smaller adjustments of these to relate them to LL. These rationales are as follows:

1. A relationship exists when:

- The stakeholder has a relationship with the LL
- The stakeholder exercises voice with respect to the LL
2. Power dependence (stakeholder dominant)
    - The LL is dependent on the stakeholder
    - The stakeholder has power over the LL
3. Power dependence (LL dominant)
    - The stakeholder is dependent on the LL
    - The LL has power over the stakeholder
4. The LL and the stakeholder is mutually dependent
5. Basis for legitimacy
    - The LL and the stakeholder is in contractual relationship
    - The stakeholder has a claim on the LL
    - The stakeholder has something at risk
    - The stakeholder has a moral claim on the LL
6. Stakeholder interests – legitimacy not implied
    - The stakeholder has an interest in the LL

Based on these rationales, we have analyzed a smart city case that will be presented in the following sections.

Methodology

This paper is reflective and explorative describing our reflections on involved stakeholders in an innovation process from a retrospective perspective. Our research started with wondering which types of stakeholders were involved in LL innovation processes and what the purpose of their engagement was. As such, we provide our reflections-on-actions, in line with the reflection-in-action approach as described by Schön (1991). Hence reflections should be understood as the thinking about the conditions for what happened in the process (Alvesson and Sköldberg 2000). From this follows that we aim at discovery, interpretation and insight, (Walsham 1995; Walsham 2006). Hence, we explore and reflect on a smart city innovation process with stakeholder involvement in the context of LL, and we do that based on a EU funded project called EAR-IT. This project was selected since it reflects the complexity of stakeholder involvement in LL processes and it is also a typical LL process for smart city innovation development.

The overarching research methodology applied in the LL activities referred to in the EAR-IT case is highly influenced by action design research (ADR) (Sein et al. 2011) and design science (DS) (Hevner et al. 2004). These research methods are typically applied in project focusing on generating design knowledge through the building and evaluating of IT artifacts (Sein et al. 2011). This approach deals with two challenges, firstly the methodology addresses a problem situation encountered in a specific setting by intervening and evaluating and secondly, constructing and evaluating an IT artefact that addresses the identified class of problem.

Case description

In this paper, the EAR-IT case is used as an illustration of the involved stakeholders, when and how they are involved and with which purpose they were involved in smart city innovation processes supported by the LL. The case illustrates how the project started with problem formulation by the project initiators and researchers, how the interaction with users went through series of iterative phases of designing, building, intervention and evaluation of the artefact in an city context.

This EAR-IT case, is an EU FP7 funded project, starting in 2012 and ending in 2014, which focuses on large scale "real-life" experimentations of intelligent acoustics for smart cities. This project had the objective to develop high societal value applications and deliver new innovative range of services and applications mainly targeting smart-buildings and smart-cities.

The technology being developed in this case were intelligent acoustic solution provides "situational awareness" by using audio monitoring in combination with Internet of Things (IoT) technologies. This is achieved via the deployment of Audio Processing Units (APUs) in the targeted in-door and out-door

environments as complementary intelligent sensors to the already available sensor modalities in two test-beds (HOBNET ID 257466; Santander ID 257992) and was developed through a collaboration between computer scientists from three different universities. The APU consisted of a microphone and an embedded processing platform that continuously "listens" to its environment and analyses the sound locally. The technology was implemented and tested outdoor in a city context and indoor in public buildings by researchers, an SME and representatives from the city.

After identifying the problem and solution space, the artefact was designed to set up the technology and to make sure that algorithm e.g. event triggers, were fully functioning. Thereafter, the first interaction with citizens was carried out in collaboration between researchers in participatory design, technology developers and the LL manager. The result from this interaction led to an identification of design principles and thus a redesign of the solution to make sure that no human voice was stored and transmitted, and that human voice could not be detected. The involvement of citizens was designed as a three-stage process that started with a structured survey on information privacy in general to a broad population consisting of 1000 citizens in five countries. The second stage was to investigate the affectees´ attitudes towards this type of technology in the implementation stage. The third stage was to explore the affectees' experience of being exposed to the technology over time. In this LL study, researchers from the different areas were involved.

In the evaluation of the IT artefact in real world contexts, the system was tested in the context of streets in a city as well as in public buildings. The process of knowledge co-creation was done through regular interaction between citizens, employees and visitors in these settings. Also, researcher from many different fields such as audio monitoring, participatory design, computer science and privacy laws were involved in the design of the final solution. Finally, the project constructed some design principles based on the learning experiences acquired from the process.

Based on this reflection a summary the findings is presented in the table below, see table 1. These were organized in eleven stakeholders, their actions, phases, power dependencies, relationship strength, and basis for legitimacy.

Stakeholder	Actions in LL process	Phase involved	Power dependence (stakeholder/ LL dominant)	Basis for Legitimacy
Developers (researchers)	Testbed integration Development of algorithm for event detection Design of scenarios Set-up of technical infrastructure (microphones, APUs, etc)	Initiation Development Implementation of technology Test Diffusion of results	Mutual	Contractual through the project agreement
Panel managers (pilot)	Recruitment and interaction with affectees and users	Needfinding Real world tests Evaluation Diffusion of results	Stakeholder	Contractual through employment
Affectees	Contribute with insights on their perspective of audio monitoring	Initiation Needfinding Real-world tests Evaluation	Stakeholder	Moral claim
Users	Contribute with contextual insights Discussion of concept Feedback on the application areas of the technology	Needfinding Development (concept design) Real world test Evaluation	Stakeholder	Moral claim
Problem owners	Defines to scope of the application area of the technology	Initiation Needfinding	Stakeholder	Something at risk
Financers	EU commission finance the project and sets the boundaries of the project, has the overarching perspective	Initiation Evaluation of the projects progress	Stakeholder	Contractual relationship
Human interaction specialist	Engaging and interacting with users and affectees focusing on privacy and design	Initiation	Mutual	Contractual

	issues related to audio monitoring	Needfinding		Risk
		Development (Design of concepts and design principles		
		Test & Evaluation		
		Diffusion of results		
Pilot managers	Plan and set up of the pilots from a user and affectees perspective	Planning	LL	Contractual relationship
		Implementation		
	Implement the technology in the real world context	Real world tests		Risk
		Evaluation		
Context provider	Support implementation of the technology in the context	Needfinding	Stakeholder	Contractual relationship
		Implementation		
Business manager	Look at possible business areas	Commercialisation	Stakeholder	n/a
	Diffusion of the results from the project	Diffusion of results		
Project managers	Responsible for the management of the project as a whole, determine the scope of the project	Throughout the whole project as well as the LL process. Not so heavily engaged in the LL process	Mutual	Contractual relationship

Exploring Power and Activities of Identified Stakeholders

The first stakeholder we will explore more deeply is the *developer* who in this project was represented by computer scientist researchers. In other cases, the developer can be manifested by an SME focusing on developing their own innovation. The developers have a mutual power-dependence relationship with the LL. This is visible in the developers' power over the development of the innovation due to their possibility to determine what to include or not in the final design of the innovation as well as their power to determine when the innovation is ready for implementation and test. These stakeholders are usually involved in the process of development of use cases, development of the technology as such, implementation, testing and diffusion of research results to a broader community. Being involved in those kernel activities gives them a lot of power to determine how the technology should be developed and implemented. The basis for legitimacy for this stakeholder is based on a contractual agreement, thus, they are tied to the LL and also with the financers. The LL need the technology to be able to test and evaluate the innovation, and the developer need the input from the considered real world implementation context to further develop the innovation.

The second stakeholder is the *human interaction specialist* who is an important stakeholder for the LL to support its processes. In our case, a participatory design researcher represented this stakeholder, but this competence can also be an internal LL resource. The relationship dependency between the stakeholder and the LL is oftentimes mutual, since the human interaction specialist is interested in performing user centered interactions and to analyze the results from different human interaction methods. Viewed from the LLs perspective, they are dependent on this stakeholders' competence within the area of interacting with users and affectees. These stakeholders also have a strong relationship with the LL and with the project due to the contractual agreement they have to deliver what is requested from the project. This stakeholder is involved in activities such as planning the innovation process, designing concepts and principles, needfinding studies, testing and evaluating. Adding to that, this stakeholder also tests the innovation prior to the implementation in the real world to be able to design the test storyline for the testers as well as determine the maturity of the innovation.

Another stakeholder that is typically involved in LL activities is the technology *users* referring to those who should actually use the smart city innovation when it is fully implemented. These users contribute with contextual insights, their needs, values and goals related to a specific situation and technology. They can contribute to all phases in the LL innovation process with discussions and evaluations of ideas, concepts, prototypes and final solutions. The relationship between the LL and this stakeholder is determined by the stakeholder who also has the power to decide if they want to participate in the LLs activities. This stakeholder is important to the LL and the involvement of the stakeholder is usually driven by the LL. Thus, if the stakeholder is not interested in collaborating or contributing to the LLs´ activities, the LL has little power to influence that. However, this stakeholder has something at risk by not contributing since that is a good way of having an impact on innovations that might be implemented in their city, i.e. they have a moral claim on the LL.

In this paper, we have made a distinction between users and technology *affetees* since this distinction became apparent in smart city contexts where people can be affected by the implementation of the technology without being a user of it. The affectees are represented by the people living in the city or the people visiting the buildings where the technology is implemented but without them really interacting with the technology. A concept related to affectees is tertiary users (Sharp et al. 2007) which refers to persons who will be affected by the use of the artifact or make decisions about its purchase. In this case, the citizens and visitors might be directly or indirectly affected by someone else's use of the system, but they will not be using the system and they will not make decisions about the purchase of it, hence we suggest to use the concept of affectees to emphasis that these stakeholders have something at stake in terms of their privacy, but they cannot directly influence the implementation or use of the technology. These stakeholders have something important and valuable at stake in the technology, but usually, these stakeholders have no, or little voice in the development of technology since they are not users or customers of the solution. Here, LLs play an important role to strengthen their influence and to make their voice heard. This is usually a complex task since the affectees are loosely coupled with the LL who has no power over the affectees and their actions. Hence, an important endeavor for the LL is to find ways

to stimulate these affectees to contribute to the design and development of the smart city innovation even though they might not be aware of the innovations existence in their city context. These stakeholders might also not be interested to contribute with their insights since they do not see a direct impact of their feedback on the solution since they are not directly involved in the innovation process. Due to the contemporary growth of smart city solutions, internet of things and ubiquitous computing solutions, this stakeholder group can be expected to grow. Hence, these stakeholders are important to involve in the LL process due to their valuable insights regarding their needs, expectations and experiences related to the situation in which the technology will be implemented.

In this paper, we have also chosen to separate between technology users and *problem owners*, since a technology user can be a one person, as it often is in smart city contexts, and the problem owners can be the city owning for instance a building or a specific traffic problem. From the perspective of problem owners, contributing to the LLs activities becomes important since they want to get a solution to the problems they encounter in their context. The problem owners can also, in some cases, be the one who triggers the LL activities to start at all. This stakeholder contributes to processes such as needfinding through their knowledge about the problem area. From the perspective of the problem owner, the dependency of the relationship between the stakeholder and the LL is mutual since both parties has an interest to solve the identified problem, which in a smart city context often is related to the city and its citizens.

The LL also has *financers* as stakeholders, meaning the organization that funds the research and/or development of the smart city innovation. In our case, the European commission funded the research and innovation activities, in other cases the city as such can be the funder. Having research and innovation projects is also a common way to fund LL activities in different domains. This means that the relationship dependency is stakeholder dominant since they have the power to stop the activities if they do not agree with the accomplished results in the project. They also have the power to decide which projects and activities to fund or not and the basis for legitimacy between the different parties are bounded by a contract. This stakeholder can also become a gatekeeper meaning that they are the one who possess the external resources for the LL activities. This means that they have the power to influence what should be done and to some extent how it should be done. Being a financer also puts them in the position where they have an influence over the LL actors' decision making process through project reviews and feedback.

To facilitate the implementation and test of the innovation being developed in the project, one important stakeholder is the *pilot manager*. This stakeholder are involved in activities such as planning, coordinating and implementing real world tests that are centered on users and affectees. Hence, this stakeholder is very important for the LL and can be employed by the LL, but that is not always the case. In our smart city case, the implementation was done in three different settings (two in-door and one out-door). To support this implementation, the participatory design researcher and the LL manager took the role as supporting the other stakeholders in how to interact with users and affectees, which questions to ask and how to report on their findings. This stakeholder has a strong and contractual relationship with the LL that is mutually dependent on each other. This stakeholder have many activities they need to master such as planning, building relationships and diffusing insights from interactions among the stakeholders. This stakeholder also coordinates the interaction between the other stakeholders such as developers, users, context providers, panel managers and project manager when the pilots are being carried out.

When it comes to the *panel manager*, this stakeholder has the responsibility to recruit and interact with a panel of users, affectees and others being involved in test and evaluation activities. This stakeholder has a strong relationship with the LL and can also be an internal part of the LL, which puts them in a contractually bounded relation with the LL. The panel manager has the power to determine which users to involve in the process as well as how to interact with them in correspondence with the human interaction specialist. Thus, this stakeholder holds the key to the people being involved in the innovation process. Viewing this from one perspective it is positive that there is one contact point with the panel of users, and affectees in the pilots, since the total amount of interaction activities these panels want to be exposed to are limited, hence having the panel open to anyone to interact with might lead to an overburdened panel. In addition, it is also important that the panel is interacted with in a good and professional way, hence having a panel manager who is responsible for the communication, invitations, privacy protection, etc. with the panel is a requirement to keep a lively and healthy panel to interact with.

The panel manager is involved in phases such as pre-studies and needfinding as well as test and evaluation. This stakeholder distribute information about the pilots externally and they also work in the background in the pilots. They plan and coordinate the interaction with the panel, they coordinate the communication between the different stakeholders involved in the process and they inform the other stakeholders of what is going on in the pilots.

In LLs activities there is also an objective to get the innovation to the market, hence an important stakeholder is the *business manager*. This stakeholder focuses on activities such as identifying possible business areas, to diffuse the project results and to work with business models for the innovation. Hence, their drive to be part of the LL activities is to make business and is also therefore dependent on the outcomes of the activities to be able to do that. Based on that, the power dependencies between the stakeholders can be viewed as mutual since the LL is dependent on the business manager to diffuse the innovation while the business manager is dependent on the result of the LL activities to be able to exploit the innovation.

The *context provider* is a stakeholder who also is important for LL activities. This stakeholder is involved in implementation activities and the relationship dependencies with the LL is stakeholder dominant since they have the power to determine if they want to partake in the activities, how and where the technology can be installed. Hence, this stakeholder has a lot of power over the LL and its activities. In some cases, this stakeholder can be a user as for instance, when the real world implementation of the innovation is to be done in people's homes or as an app in smart phones. In our smart city case, this stakeholder took the form of the city, and the managers in the public buildings. This stakeholder can be understood also as a gatekeeper since they possesses the real world context as a resource and if they do not whish to offer their context, the LL has no power to convince them otherwise.

The last stakeholder we have identified is the *project manager*. This stakeholder is responsible for the management of the research and innovation project as a whole, but might not be so heavily engaged in the LL activities as such since the pilot manager usually manages these activities in communication with the project manager. This relationship is built on mutual dependencies since the LL needs someone to drive the project, and the project manager needs an experimentation arena as well as methodological support. The basis for legitimacy for this stakeholder was in our case contractual through the project. This stakeholder often has the role of being the initiator who decides on potential actors to engage in the project.

Conclusions

The eleven stakeholders we identified in this study are developers, researchers, users, affectees, problem owners, financers, pilot managers, panel managers, context provider, business manager, and project manager. Among these we found that the relation between the stakeholder and the LL is principally stakeholder dominant or mutually dependent, and rarely LL dominant. Some stakeholders are bounded to the LL by contract, such as developers, project managers, and pilot managers. While some stakeholders are mainly bounded to the LL because they have a moral claim on the innovation activities, such as users and affectees. These stakeholders are of vital importance for the LL to handle in smart city innovation processes, since the LL strive to develop innovations that answer to these stakeholders needs and goals, while at the same time thee are loosely coupled to the LL and its activities.

Other stakeholders such as the project manager, financer and researchers are involved in the LL due to the nature of the LL being studied is a research driven LL. We have not studied LLs driven by other forces such as business; hence, other stakeholders such as customers could be more important to understand. Some of these stakeholders are involved in few parts of the innovation process such as the panel manager and affectees who are mainly involved in pre studies and the test and evaluation phase, others are part of several activities such as pilot manager, human interaction specialists and developers who are active from pre-studies to evaluation.

In sum, the relationship dependency between the LL and the stakeholder is more often stakeholder dominant rather than LL dominant. This means that the LL often becomes dependent on the stakeholders and their will to collaborate and contribute to the LL. This puts the LL in a vulnerable position and is an important aspect to handle for LL managers. Some of the stakeholders have a contractual relation to the LL while others have relation to the LL due to perceived risk or that they have a moral claim, such as the

users and affectees. For LL managers, this implies that they need to put efforts into creating relations with their stakeholders that are more LL dominant.

REFERENCES

Almirall, and Wareham, J. 2011. "Living Labs: Arbiters of Mid- and Ground-Level Innovation," *Technology Analysis & Strategic Management* (23:1), pp. 87-102.

Alvesson, M., and Sköldberg, K. 2000. *Reflexive Methodology: New Vistas for Qualitative Research*. London, UK. : SAGE Publications.

Angelidou, M. 2014. "Smart City Policies: A Spatial Approach," *Cities* (41), pp. S3-S11.

Bakici, T., Almirall, E., and Wareham, J. 2013. "The Role of Public Open Innovation Intermediaries in Local Government and the Public Sector," *Technology Analysis & Strategic Management* (25:3), pp. 311-327.

Caragliu, A., Del Bo, C., and Nijkamp, P. 2011. "Smart Cities in Europe," *Journal of Urban Technology* (18:2), pp. 65-82.

Freeman, R. E. 1984. *Strategic Management: A Stakeholder Approach*. Boston: Pitman.

Gould, R. W. 2012. "Open Innovation and Stakeholder Engagement," *2012* (7:3).

Hevner, A. R., March, S. T., Park, J., and Ram, S. 2004. "Design Science in Information Systems Research " *MIS Quarterly* (28), pp. 75-105.

HOBNET. ID 257466. "Eu Fp7 Hobnet Holistic Platform Design for Smart Buildings of the Future Internnet (Id257466)."

Hollands, R. G. 2008. "Will the Real Smart City Please Stand Up?," *City* (12:3), pp. 303-320.

Inkinen, T., and Suorsa, K. 2010. "Intermediaries in Regional Innovation Systems: High-Technology Enterprise Survey from Northern Finland," *European Planning Studies* (18:2), pp. 169-187.

Jungwoo, L., and Hyejung, L. 2014. "Developing and Validating a Citizen-Centric Typology for Smart City Services," *Government Information Quarterly* (31:1), pp. S93-S105.

Katzy, B., Turgut, E., Holzmann, T., and Sailer, K. 2013. "Innovation Intermediaries: A Process View on Open Innovation Coordination," *Technology Analysis & Strategic Management* (25:3), pp. 295-309.

Laplume, A. O., Sonpar, K., and Litz, R. A. 2008. "Stakeholder Theory: Reviewing a Theory That Moves Us," *Journal of Management* (34:6), pp. 1152-1189.

Leminen, S., and Westerlund, M. 2012. "Towards Innovation in Living Labs Networks," *International Journal of Product Development* (17:1/2), pp. 43-59.

Love, J. H., Roper, S., and Bryson, J. R. 2011. "Openness, Knowledge, Innovation and Growth in Uk Business Services," *Research Policy* (40:10), pp. 1438-1452.

Merriam, S. 1994. *Fallstudien Som Forskningsmetod*. Lund: Studentlitteratur.

Mitchell, R. K., Agle, B. R., Chrisman, J. J., and Spence, L. J. 2011. "Toward a Theory of Stakeholder Salience in Family Firms," *Business Ethics Quarterly* (21:2), pp. 235-255.

Mitchell, R. K., Agle, B. R., and Wood, D. J. 1997. "Toward a Theory of Stakeholder Identification and Salience: Defining the Principle of Who and What Really Counts," *The Academy of Management Review* (22:4), pp. 853-886.

Neirotti, P., De Marco, A., Cagliano, A. C., Mangano, G., and Scorrano, F. 2014. "Current Trends in Smart City Initiatives: Some Stylised Facts," *Cities* (38), pp. 25-36.

Niitamo, V.-P., Westerlund, M., and Leminen, S. 2012. "A Small-Firm Perspective on the Benefits of Living Labs," *Technology Innovation Management Review*:September 2012), pp. 44-49.

Nyström, A.-G., Leminen, S., Westerlund, M., and Kortelainen, M. 2014. "Actor Roles and Role Patterns Influencing Innovation in Living Labs," *Industrial Marketing Management* (43:3), pp. 483-495.

Santander, S. ID 257992. "Eu Fp7 Project Smart Santander (Id 257992)."

Schön, D. 1991. *The Reflective Practitioner: How Professionals Think in Action*. London, UK: Ashgate Publishing Limited.

Sein, M., K, Henfridsson, O., Purao, S., Rossi, M., and Lindgren, R. 2011. "Action Design Research," *MIS Quarterly* (35:1), pp. 37-56.

Sharp, H., Rogers, Y., and Preece, J. 2007. *Interaction Design: Beyond Human-Computer Interaction*, (2nd ed.). Chichester: John Wiley & Sons Ltd.

Sieg, J. H., Wallin, M. W., and von Krogh, G. 2010. "Managerial Challenges in Open Innovation: A Study of Innovation Intermediation in the Chemical Industry," *R&D Management* (40:3), pp. 281-291.

Ståhlbröst, A. 2012. "A Set of Key-Principles to Assess the Impact of Living Labs," *International Journal of Product Development* (17:1-2), pp. 60-75.

Ståhlbröst, A. 2013. "A Living Lab as a Service : Creating Value for Micro-Enterprises through Collaboration and Innovation," *Technology Innovation Management Review* (Nov 2013), pp. 37-42.

Ståhlbröst, A., Sällström, A., and Hollosi, D. 2014. "Audio Monitoring in Smart Cities - a Privacy Perspective," *e-Society 2014*, Madrid, Spain, pp. 28-22 March.

Walsham, G. 1995. "Interpretive Case Studies in Is-Research: Nature and Method," *European Journal of Information Systems* (4), pp. 74-81.

Walsham, G. 2006. "Doing Interpretive Research," *European Journal of Information Systems* (15), pp. 320-330.