

A Living Lab as a Service: Creating Value for Micro-enterprises through Collaboration and Innovation

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“All entrepreneurs need to be competitive in order to push themselves to break new boundaries. But without collaboration, their ideas will never become reality.”

Sir Richard Branson
Business magnate and investor

The need to innovate is increasingly important for all types and sizes of organizations, but the opportunities for innovation differ substantially between them. For micro-, small-, and medium-sized enterprises, innovation activities are both crucial and demanding because of limited resources, competencies, or vision to innovate their offerings. To support these organizations, the concept of living labs as a service has started to emerge. This concept refers to living labs offering services such as designing the idea-generation processes, planning or carrying out real-world tests of innovations, and pre-market launch assessments. In this article, we will present the findings from a study of micro-enterprises operating in the information technology development sector, including the experienced value of services provided to the companies by a research-based living lab. We share experiences from Botnia, our own living lab in northern Sweden. In this living lab, our aim of creating value for customers is of key importance. Our study shows that using a living lab as a service can generate three different types of value: improved innovations, the role the living lab can play, and the support the living lab offers.

Introduction

Innovation is an important and oftentimes challenging task for many organizations, and for micro-, small-, and medium-sized enterprises, the task is even more challenging because they might not have the resources or competencies to innovate effectively. These organizations often are focused on their everyday operations and their core business, and they might not recognize opportunities to innovate even though innovation is required to sustain an organization. In addition, advocates of open innovation suggests that firms need to open up their borders and include external sources of knowledge into their innovation processes (e.g., Chesbrough, 2011: tinyurl.com/p78gtwf; Chesbrough and Appleyard, 2007: tinyurl.com/bp9gmee). This open approach has shown that large, technology-driven companies can benefit from re-

lying extensively on external sources of knowledge in the innovation process (Chesbrough, 2003; tinyurl.com/kp33d22). Accordingly, intermediary organizations such as Innocentive (innocentive.com), NineSigma (ninesigma.com), and yet2 (yet2.com), have emerged to facilitate and support the innovation processes of all types of companies, including even brokers, third parties, collaboration services, and agencies (Howells, 2006: tinyurl.com/ljdg3sw; Katzy et al., 2013: tinyurl.com/mef7lun; Winch and Courtney, 2007: tinyurl.com/la4x7n3). In each of these intermediary organizations, the aim is to create value for clients by identifying, accessing, and transferring innovative solutions to problems in various stages of the innovation process. One type of innovation intermediary that is becoming increasingly popular around the world is the living lab (Almirall and Wareham, 2011: tinyurl.com/lrz3dg2; Cleland et al., 2012: tinyurl.com/mz3c86v).

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Today there are approximately 330 living labs active in Canada, South Africa, Brazil, China, and many European countries, among others. These living labs often take the role of mediators between different innovation stakeholders such as users, large companies, suppliers, universities, small- and medium-sized enterprises, and governmental organizations (Almirall and Wareham, 2011; tinyurl.com/lrz3dg2; Ståhlbröst, 2012; tinyurl.com/l8ur4cu). Living labs also are proactive with respect to innovation and focus on supporting the development of innovations that help users carry out everyday activities, such as saving energy and communicating with their peers, in an improved manner.

For micro-enterprises (i.e., companies with fewer than 10 employees) in particular, a living lab can offer services such as supporting ideation, analysis, construction, deployment, use, evaluation, research, and management of innovation in real-world contexts. Currently, published research into the value of living lab services for micro-, small-, and medium-sized enterprises is rather limited, which hampers the possible impact these services can have in real-world innovation contexts. Previous research related to living labs and small firms has focused on the experiences of the living lab approach with special attention to the experiences of user involvement in the innovation processes of small firms (Niitamo et al., 2012; timreview.ca/article/608), or it has focused on the impact the living lab approach has on innovation processes carried out small firms (Ståhlbröst, 2012; tinyurl.com/l8ur4cu). To reap the benefits of living lab services, it is important to increase our understanding of how these services can offer value to stakeholders.

The purpose of this article is to examine the experienced value of a living lab's services for micro-enterprises. The micro-enterprises involved in the study all operated within the domain of information technology development. We interviewed the owners or managers of the company because they had experience of using living lab services and could therefore provide insights into the impact of such collaboration. In this article, a case study approach is adopted to explore a living lab that is situated at a university. This living lab focuses on: i) offering services that support the innovation processes of its different stakeholders, and ii) diffusing and contributing to research carried out in relation to the activities of the living lab; hence, it can be labelled a research living lab. Before moving to an analysis of the innovation process supported by the research living lab, we will discuss salient literature on living labs and experiences of value.

Customer Value

Among living lab researchers, it is common to view living labs as a specific research approach that supports user involvement and innovation processes carried out in real-world contexts (e.g., Bergvall-Kåreborn and Ståhlbröst, 2009; tinyurl.com/k6kya83; Leminen and Westerglund, 2012; tinyurl.com/orlnfh5). A quattro-helix approach is applied, which involves four different types of stakeholders in innovation processes: researchers, companies, users, and public organizations. Thus, a living lab is an environment that has a defined approach to support its actions. Typically, this approach is based on five key principles, which guide the operations of the living lab: value, sustainability, influence, realism, and openness (Ståhlbröst, 2012; tinyurl.com/l8ur4cu). In this article, we focus on the key principle of value; specifically, we examine the customer value that living lab services offer to micro-enterprises.

In its broadest sense, the value for a micro-enterprise can be expressed as the experienced difference between the benefits and sacrifices of their efforts in innovation processes supported by living lab services. For a micro-enterprise, this value can be a business value, in the sense that it contributes to long-term prosperity and growth. The term business value is somewhat intangible and includes all forms of value that determine the health and well-being of an organization in the long run. Hence, business value includes employee value, customer value, supplier value, managerial value, and societal value.

Case Description

In this article, the Botnia Living Lab (testplats.com) in northern Sweden constitutes the basis for our journey into the conceptualization of living lab services and their value. This living lab is part of an research, development, and innovation (R&D&I) joint venture with the Centre for Distance Spanning Technology (ltu.se/centres/cdt), whose main objective is to generate sustainable business innovation and innovation research. One of the roles of this living labs is to facilitate a real-life research context for strategies, tools, and services for open, user-driven service innovation, while at the same time supporting the innovation process for its stakeholders. Luleå University of Technology (ltu.se) is the host and legal body for the living lab's operations; a board of directors with industrial majority sets its strategic direction; and a core management team is responsible for tactical planning and daily operations. As an organization that is mainly driven by current pro-

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jects, the ongoing activities in the living lab are dependent on the collaboration between people from different organizations, which also can be related to the concept of provider-driven living lab (Leminen et al., 2012; timreview.ca/article/602).

This research-based living lab has a large network that provides expertise in many diverse areas, such as project management, information technology, entrepreneurship, business development, and policy making. Thus, to carry out innovation activities, the living lab does not need to have all the required competences residing within the organization; through its relationships with other organizations and individuals, it can access specific expertise for a particular project or task within a project. The operation of this living lab depends on different roles (Figure 1). For instance, there is a manager, who often functions as the contact point for customers or other stakeholders and with whom the co-operation is formalized with, for instance, signed business agreements and defined actions to be carried out. Other roles include the panel facilitator, who manages the end-user collaboration; the innovation process manager, who co-creates and implements the innovation process together with the stakeholders; and the researcher, who develops and implements new approaches and tools to test in the innovation process within the living lab and who analyzes the results of the process. Using this operational structure, the services the living lab offers were mainly related to applying for funding and managing the innovation process, including end-user engagement and the analysis and presentation of results from the innovation process.

Methodology

Given the inductive and exploratory nature of our research focus, we adopted a case study approach to illustrate the experienced values of using living lab services for micro-enterprises that want to innovate. A case study approach is appropriate for three reasons. First, case studies offer flexibility when it comes to the use of multiple data-collection methods to enrich the research findings (Yin, 2003; tinyurl.com/clf7wbd). Second, a case study generates rich stories rather than statistical information, and thus, it supports an enhanced understanding of the complexity of an organization from an insider perspective. Third, case studies make it possible for the researchers to gain a holistic view of the phenomenon under study (Walsham, 1995; tinyurl.com/nyca4vj).

Our goal was to obtain in-depth understanding of living lab engagements from the perspective of micro-enter-

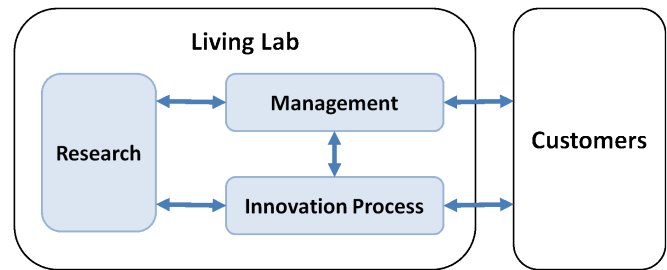


Figure 1. The organization of the Botnia Living Lab

prises. In total, five interviews were conducted at five different micro-enterprises that had been involved in the living lab's digital-innovation activities. We used a semi-structured interview format, which means that we used a pre-decided interview guide while we encouraged a discussion with respondents to drive the interviews questions. On average, the interviews lasted one hour.

The micro-enterprises involved in our study were from the same region as the living lab and had been involved in one or more short projects with the living lab during a period of five years. All of the businesses operated in the domain of Information technology system development in a business-to-business setting. The respondents were either chief executive officers (CEOs) or founders of the micro-enterprises, and they were willing to provide use with rich information about their experiences, through which we were able to acquire a "holistic view" of the companies' strategic and operational practices. All of the companies involved in the study were micro-enterprises (i.e., they had fewer than 10 employees).

In addition to the interviews, on-site observations at the living lab were combined with field notes from project meetings and informal observations of the innovation-project activities. In this study, the main objective of on-site observations was to understand how the interaction between the micro-enterprises and the living lab was organized and managed. The researcher has been deeply involved in the living lab's operations for a long time; some of these informal observations were made during daily activities such as planning meetings, lunches, and conferences.

The Value of the Living Lab as a Service

Prior to the coding of the collected data, the preparation stage consisted of activities such as transcribing interview tapes, typing research notes, and summarizing

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observation notes. The aim during the initial stage of analysis, the open coding, was to identify overarching themes and categories based on the collected data. This stage of the analysis was open and three themes did emerge: i) the role of the living lab, ii) the support it offers, and iii) the impacts of its services on the micro-enterprises. Based on these themes, the results were then analyzed to gain deep insights into the value received by the micro-enterprises, as discussed in the sub-sections that follow.

Role

When the micro-enterprises used the services offered by the living lab, it was often because of a collaboration initiative offered by the living lab. These initiatives were, for example, in the form of applying for a collaborative project together or as a result of the living lab contacting the micro-enterprises to offer their services to them. Based on their experiences from using the living lab's services, most of the companies appreciated the valuable perspective that the living lab was able to offer them in terms of critical insights into their innovation process. For example, the living lab was perceived as having its eye on the future on the innovation instead of only focusing on the business aspects of the interaction. This view is based on the living lab's goal of helping the micro-enterprises further develop their innovations into mature solutions, even at an early and premature stage. They focus on the specific innovation and its results, as one of the interview subjects stated it, "The living lab focuses on something more concrete, as specific projects focus on developing products and services". The living lab does not have any financial interest in the innovations because they have not funded their development, and this was viewed by the micro-enterprises as a further value in their collaboration. Accordingly, the micro-enterprises found that the living lab can be more objective and take on a critical perspective on the innovation. For the micro-enterprises, objective, critical feedback is valuable because they want to develop the best innovations possible, and they often have invested a lot of resources into the innovation. Hence, the living lab focuses on a micro-enterprise's innovation and development process, not on their business.

Support

In this study, micro-enterprises were also found to value the support provided by the living lab in managing the innovation process. Many micro-enterprises do not have the competence or resources to drive that process themselves, hence they appreciate that living

lab is an innovation-process leader that focuses on involving users and researchers. The living lab has a well-defined innovation process in which they involve different stakeholders, such as users, industry, and researchers as required, and the micro-enterprises saw that as a benefit. As one of the interview subjects expressed it, "The living lab should have a supportive role, like an advisory board". Furthermore, one of the main benefits identified by the micro-enterprises is the involvement of researchers in the process. In this way, the living lab can strengthen the innovation power of the micro-enterprises by involving the right competence at the right time. The micro-enterprises also stated that they see the living lab services as a networking service where they receive support in establishing new business relations and setting up meetings with industry and researchers from the living lab's large network of partners and relations. Thus, the living lab can function as a network hub where they intermediate the intersection between different stakeholders to ensure that the right competences meet and thus boost the innovation effort. In this way, it becomes possible for the micro-enterprises to start new collaborations, and that strengthens their commercialization process. The living lab becomes a fertile ground for establishing new business relations.

For many micro-enterprises, it can be hard to find and engage resources that do not reside within their own company due to their vulnerability and focus on their everyday business. But, the living lab can not only support the micro-enterprises in finding the right collaboration partners or driving the innovation process, the micro-enterprises also value the lab's suggestions for tools that they can use to support their innovation process and the help the lab provides in the process of selecting and involving users in their development processes.

Even though the living lab can contribute with support in different ways, they face a challenge in deciding how much support they should offer. Here, the micro-enterprises expressed an expectation and need for a lot of support which, if they would pay for the service, would have been rather expensive. Hence, one challenge for the living lab when they offer services is to find the balance between the costs and benefits of support. This challenge is also related to the micro-enterprises' need to receive fast and agile support in the form of input into the innovation process. Working with micro-enterprises also includes the challenges of stable financing. Here, one expectation from the micro-enterprises was

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that the living lab should also be able to finance smaller development projects. The living lab often applies for funding of innovation activities in collaboration with the micro-enterprises, and this is often a long process, especially for micro-enterprises that need to quickly respond to changes in their business context, which is difficult to accomplish in large and long projects. In summary, expectations of micro-enterprises must be managed with regards to the services offered by living labs.

Impacts

The micro-enterprises also responded that their products and services became better due to their collaboration with the living lab. Based on feedback from users during such collaboration, they found that they could, for instance, make their products easier to use. The micro-enterprises also learned a lot about innovation and how users can be involved in their process. Despite its importance, gathering feedback from users is often missing from the innovation process of micro-enterprises because they lack either the knowledge or the resources to carry out these activities. With help from the living lab, these micro-enterprises were able to involve users in their processes, thereby not only increasing their knowledge and understanding of their products, but also of the value of involving users in the innovation process. As a result, the micro-enterprises began involving users in innovation processes that were unrelated to their involvement with the living lab.

The micro-enterprises also found that using living lab services shortened their development time as well as their innovation process, because they could test and validate their innovation quickly. Typically, micro-enterprises need to invest large amounts of time to secure commercial success of their developments, but because living labs provide access to end users, they can provide timely feedback in both early and late stages of development. Furthermore, the micro-enterprises received increased visibility in the media and in the community, because the living lab released press releases, organized events in the city, and published information about their activities and events online.

Conclusion

With this case study, our aim was to explore the value of the services offered by a research-based living lab, as experienced by its micro-enterprise customers. Based on the results from this research, we conclude that living lab services provide value to micro-enterprises in three different ways: i) the micro-enterprises appreciate the role

the living lab takes in the innovation process, ii) they benefit from the support the living lab offers, and iii) the living lab's services directly impact the quality of the micro-enterprises' products or services and their innovation processes.

Micro-enterprises frequently work in isolation; hence, they value opportunities for insights from an outside perspective. In this study, we found that the living lab services offer opportunities to gain multi-dimensional input on an innovation. This value is created through the engagement of users and other relevant stakeholders in the process, but also by the different roles played by the operational personnel in the Living Lab. This study has shown that a living lab can play the role of collaborative partner, constructive critic, innovation-process manager, and innovation adviser. Thus, micro-enterprises can receive valuable insights from an external partner that is focused on the innovation process, and this process in turn makes it possible for these micro-enterprises to boost their innovation capacity.

In this study, we also found that many micro-enterprises do not have the capacity to innovate by themselves, especially when it comes to including other stakeholders such as end users in their innovation process. Either they do not have access to users, or they do not know how to involve users in an efficient manner. We found that micro-enterprises value the support that living lab services provide to their innovation processes. Our findings show that supporting involvement of various stakeholders such as end users in the innovation process, the strengthening of the innovation power through the engagement of various competencies, and the support in networking provide micro-enterprises with fertile ground for innovation.

When it comes to the actual impact of living lab services, this study shows that these services can lead to an increased visibility, a shortened development process, improved products, and an enhanced learning and understanding about innovation processes and user involvement. The living lab can support the micro-enterprise by bringing their innovation to other stakeholders such as users and media. This process, in turn, offers opportunities for the micro-enterprises to expand their businesses and also to understand their markets more thoroughly. This finding is of special interest to newly started micro-enterprises and those trying to reach a new market with their innovation.

To further deepen the knowledge about this phenomenon, a broader study of micro-enterprises and their ex-

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periences of using a living lab as a service is needed. Future research should seek in-depth understanding of the nature of the services that are offered by the Living Lab and the stakeholders using these services. In addition, researching the experienced values from living lab services offered by different types of living labs, as suggested by Leminen and colleagues (2012; timreview.ca/article/602), would be fruitful.

About the Author

Anna Ståhlbröst is a Senior Lecturer in Social Informatics at Luleå University of Technology, Sweden, where she also holds a PhD in Social Informatics. Her research is focused on the phenomena of living labs and open, user-driven innovation processes, with special interest in service innovation and end-user needs and motivations. Anna's research is related to different application areas such as energy, domestic-IT use, and smart cities. She has participated in several international and national innovation and research projects, and she has contributed to the field with more than forty journal and conference articles.

Citation: Ståhlbröst. 2013. A Living Lab as a Service: Creating Value for Micro-enterprises through Collaboration and Innovation. *Technology Innovation Management Review*. November 2013: 37–42.



Keywords: living lab, value, micro-enterprise, innovation intermediary, experience-based values