ACTION RESEARCH AS A FRAMEWORK TO EVALUATE THE OPERATION OF A LIVING LAB

> ***"Seeking objective truth, the modern worldview makes no connection between knowledge and power. This positivist worldview has outlived its usefulness: as Habermas announced, 'modernism is dead' (Reason and Bradbury, 2001)."***

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ABSTRACT

Living lab research consists of gathering user feedback on innovations implemented in a real-life context (Eriksson et al., 2005). This can be facilitated by means of a panel-based approach (Schuurman et al., 2012). Since this panel is vital for living lab research, it is important to know whether all panel members are satisfied with the operation of the living lab itself. An interesting way to capture and act upon the delights and frustrations of a panel can be by adopting an action research approach. Within a participatory action research process, *"communities of inquiry and action evolve and address questions and issues that are significant for those who participate as co-researchers"* (Reason and Bradbury, 2008). Action research contrasts with many research methods, which emphasize disinterested researchers and reproducibility of findings. Amongst others, Ståhlbröst (2008) already used action research as a methodology within a living lab environment aiming to involve users early and throughout the whole development process, and to design new IT systems from the basis of these users' needs. But how can this research approach be a framework to get to know your participants' thoughts on the operation of your living lab? How can action research help to involve as much panel members as possible and to encourage people to share their opinion? Does active research actually result in more practical solutions for a detected problem? In order to capture and solve frustrations of the iMinds Living Lab panel members, a researcher was actively involved in a selection of living lab projects and panel members themselves were inserted in the reflection phase of an action design research from which the obtained knowledge resulted in the co-creation of an iMinds Living Labs website for panel members.

KEYWORDS

Action research - Participatory action research – Panel management – User research – Living lab research

INTRODUCTION

A group of users willing to participate in research projects is essential for a living lab. These participants are of vital importance for the functioning of a living lab because researchers need them to gather feedback on innovations which these people are testing in their natural environment. The underlying theory is that people's ideas,

experiences, and knowledge, as well as their daily needs of support from products, services, or applications, should be the starting point in innovation (Bergvall-Kareborn and Ståhlbröst, 2009).

iMinds Living Labs (https://www.iminds.be/en/succeed-with-digital-research/proeftuinonderzoek) offers researchers and entrepreneurs the chance to test and co-develop their innovative solutions thoroughly with their target audience aiming at products and services which are better adapted to the market. In order to do so iMinds Living Labs has its own user panel of 17.237 active members. For every research project iMinds panel managers invite people from this entire panel to become part of the research project community. In this way, living labs are user-centric with user involvement as an essential characteristic of living lab research. Not only are users empowered by living labs (Veeckman et al., 2013), living labs depend on the involvement and motivation of these users in order to generate useful user contribution (Schuurman, 2015). The past few years, research was done on the motivation, attrition and behavior of the iMinds Living Labs panel members (Baccarne et al., 2013; Logghe et al., 2014) but the panel members were rarely involved in designing the operation of the living lab as such. Therefore, we opted for an action research design approach to involve panel members in the active redesign of panel management practices within the daily living lab project operations.

METHODOLOGY

Before we used action research as a methodology within our living lab, we conducted a literature review in order to study the advantages and disadvantages of this method. After this literature review, we will illustrate our experience by means of a case study and formulate our conclusions.

WHAT IS ACTION RESEARCH?

Kurt Lewin (1890-1947) is generally credited as the person who first used the term 'action research' in his paper "Action Research and Minority Problems". He described action research as *"a comparative research on the conditions and effects of various forms of social action and research leading to social action"* that uses *"a spiral of steps, each of which is composed of a circle of planning, action, and fact-finding about the result of the action"* (Lewin, 1946). More recent authors such as Checkland and Holwell (1998) distinguish three main phases of the process of action research: (1) the researcher enters a real-world situation, (2) actions in the situation can begin and (3) the researcher leaves the situation and reflects on it in order to find a variety of lessons learned (Rönnerman, 2004; Checkland and Holwell, 1998). Several authors (Checkland and Holwell, 1998; McNiff et al., 2003; Norton, 2009; Donnelly and O'Keeffe, 2013) describe the action research process as one iterative cycle (see figure 1) but according to others (Chiasson et al., 2009; Ståhlbröst, 2008) this process has consisted of several iterative cycles because actions in the situation have been linear, while the learning and knowledge acquisition is more iterative in character (see figure 2).

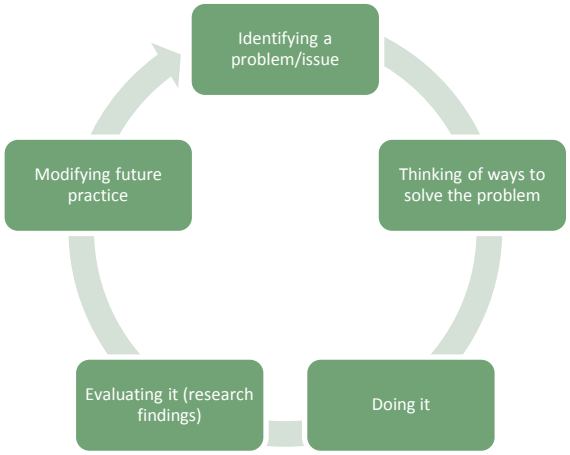

Figure 1: One iterative cycle action research process (Norton, 2009)

Figure 2: Several iterative cycles action research process (Ståhlbröst, 2008)

Action research starts from a practical problem within a certain group of people. The aim of this methodology is to find a solution for this practical problem but also to develop theoretical knowledge for the research community (Chiasson et al., 2009). Action research is not research on people, or even for people but with people. It tries to understand the context where the research is being carried out and helping people within the context to bring about the necessary changes to solve their problem. Action research is about understanding the context of the field and through collaboration bringing about change (Donnelly and O'Keeffe, 2013). Action research is mostly used to facilitate the understanding of complex human processes, rather than constructing universal social laws (Baskerville, 1999). It is particularly relevant when trying to "solve an identified class of problems" and producing guidelines for best practice (Sein et al., 2011). This is also one of the objectives of a living lab.

WHY USE ACTION RESEARCH IN A LIVING LAB ENVIRONMENT?

Research in the West has been integral with a positivist worldview, a view that sees science as separate from everyday life and the researcher as subject within a world of separate objects (Reason and Bradbury, 2001). The concept of a living lab is based on a systematic user co-creation approach integrating research and innovation processes. These are integrated through the co-creation, exploration, experimentation and evaluation of innovative ideas, scenarios, concepts and related technological artefacts in real life use cases (Kusiak and Tang, 2006). In order to gather data about the implementation of an innovation in the everyday life of people, living lab research has to look for methods beyond this traditional positivist worldview.

Following Reason and Bradbury (2001) we can argue that the characteristics of action research lead to more in-depth research because the practical and theoretical outcomes of the research process are grounded in the perspective and interests of those immediately concerned (in this paper the living lab panel), and not filtered through an outside researcher's preconceptions and interests in contrast to a positivist research approach. Earlier research has shown that intrinsic motivation is very important for living lab users to stay part of a living lab community (Ståhlbröst and Bergvall-Kåreborn, 2011; Baccarne et al., 2013). Therefore it is important to find out about their delights and frustrations. For this purpose, we can use action research as a framework to co-create solutions, validate and implement them in the concerned living lab.

Many authors (Baskerville and Wood-Harper, 1998; Baskerville and Wood-Harper, 1996; Checkland and Holwell, 1998b; Chiasson et al. 2008) state that action research handles problems that "need to be solved" but we tend to

follow Ståhlbröst's (2006) focus on the contribution to a situation from an opportunity seeking perspective. In this way we were able to use the framework of Ståhlbröst (2008) to start our research on the evaluation of our living lab operation by the panel members themselves: experienced panel members were invited to become part of the "reflection" process of this framework. In this way, not only the researcher reflected on his or her involvement in the process, but also users evaluated their own participation within iMinds Living Labs.

The most characterizing aspect of action research is the fact that the researcher becomes involved in a situation. In this way the obtained knowledge can be immediately applied (Baskerville, 1999). When a researcher enters a social practice he or she becomes involved both as a participant in the situation and as a researcher of the situation (Ståhlbröst, 2008). That is why our researcher became panel member by herself and took part in various research steps, guided by other living lab researchers than herself.

Case study: Evaluation of iMinds Living Labs by its panel

A combined action research process

Chiasson et al. (2009) state that action research emphasizes both theory and practice. It is important that the researcher considers these two parallel and interacting cycles (Chiasson et al., 2009). Therefore we made a combination of the two models, previously described: the "Several iterative cycles action research process" model of Ståhlbröst (2008) after Checkland and Holwell (1998) and the "One iterative cycle action research process" of Norton (2009) which is more focused on practice. We more or less inserted the "practical" model into the fourth step (reflection) of the action research cycle of Ståhlbröst (2008).

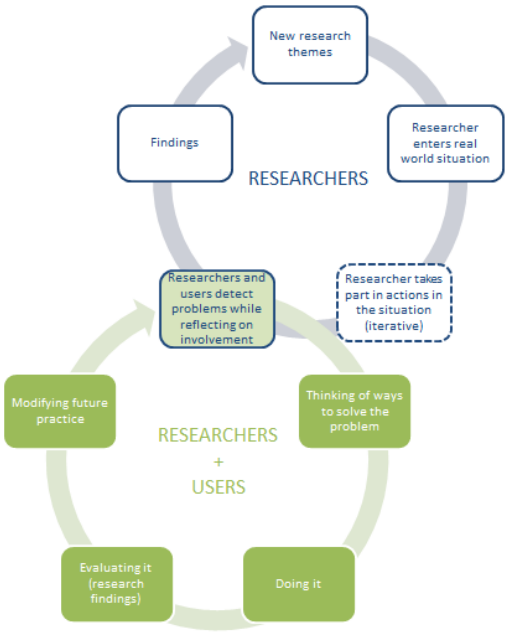

Figure 3: Our combined action research method

According to the combination of these two models, the first step of our implementation of action research was to gain knowledge about the current situation. This is enabled by identifying the primary situation that constitutes the basis for the organization's desire to change, or alter its behavior (Baskerville and Pries-Heje, 1999): after 6 years of living lab research at iMinds Living Labs a lot had changed so we described "to get to know the delights and frustrations of our panel members" as *a new research theme*.

Following Ståhlbröst (2008), the second phase in our action research approach has been to plan, carry out, and analyze the ongoing actions in the situation by means of becoming a panel member as a researcher myself at iMinds Living Labs. In other words, the *researcher enters a real world situation* (the living lab). In this process, it is important that the researcher endeavors to make sense of his or her increasing experience and knowledge in the situation.

In a third phase, one should apply knowledge to a project and derive knowledge from each case separately (Ståhlbröst, 2008). To give an example, we decided not to create an extra blog for the two most recent projects (Spott and We Run) because an earlier research project (De Kopploeg) learned us our panel did not see a blog as a great added value. We captured this input because the researcher *took part in actions* (research steps) *in the situation* (research projects) *on an iterative basis*.

Still, our panel members were looking for an overview of the iMinds Living Lab projects they participated in. Also, being a panel member and having conversations with other panel members, we found out that the iMinds Living Labs panel has multiple unfulfilled needs:

- They want more detailed information about the promotors of our living lab projects
- They want more detailed results next to the infographic they receive now
- They want a more efficient way to fill in surveys instead of waiting for an email with an invitation
- They want to be able to look back to a project
- …

In order *to reflect on the involvement of researchers and panel members* (Baskerville and Pries-Heje, 1999; Checkland and Holwell, 1998), we invited experienced panel members from each iMinds Living Lab persona type (Logghe et al., 2015) to a co-creation session to discuss the delights and frustrations of our panel members. By inviting experienced panel members to these co-creation sessions, they became part of the reflection process on our operations. In this way learning occurs in two different processes: (1) as an ongoing process in reflections and discussion in each project and (2) as an ongoing process in our research while reflecting on the method and projects as a whole (Ståhlbröst, 2008). During this reflictive co-creation session, we found underlying needs and expectations: (1) our panel members want to distinguish their role in the innovation process in a more clear way, (2) they expect that the innovation is adapted according to their feedback and (3) they understand that the innovations which are tested are not finished yet. Based on these needs, the panel members were asked to *think about ways to solve these problems*. They indicated that it would be useful to have the possibility to consult a website with a project flow for each living lab research project indicating in which research step users are needed and what will happen with their input. Secondly, they want more concrete feedback. Until now they received an infographic via email with the main conclusions of a research step, but they want to receive a more detailed report with deeper findings. They want to consult this "report" on a website and not via email. Also, they want to receive more information about the final product when the research project is finished. This could be a link to the app store or a newsletter of the company who created the innovation. Eventually these sessions resulted in mock-ups of a iMinds Living Lab website ("*Doing it*") where panel members can log in and use functionalities solving the before mentioned frustrations. These mock-ups were *validated* by means of a survey and were handed over to our Marketing and Communication team who are now constructing an iMinds Living Lab website. In June 2016, a final session will be organized to ask our panel members for feedback regarding the designed iMinds Living Labs in order to give our panel members the possibility to give an indication about what features or aspects should be *modified* before the final launch of the website.

PRECONCEPTIONS OF ACTION RESEARCH UNDER THE MICROSCOPE

Before we used action research as a framework for our research theme about the operation evaluation of the iMinds Living Labs, we studied critics on action research. We agree that as a researcher interested in using action research as a method, you need to be aware of major criticisms, and have confidence in the approach of action research being well thought out and systematic (Donnelly and O'Keeffe, 2013). We managed to divide critics on action research into three categories:

1. Action research is no valid research as seen from positivist/scientific perspective. The research becomes a part of the study and personal understanding will invading the observations and deductions that follow (Baskerville and Wood-Harper, 1996; Baskerville and Pries-Heje, 1999; Mattson, 2004; Donnelly and O'Keeffe, 2013).
2. The largely un-theorised descriptions of action research lends itself toward many forms of pluralistic approaches to research (Chiasson et al., 2009; Donnelly and O'Keeffe, 2013).
3. Findings are not generalizable whereby action research runs the risk of becoming more action research (Baskerville and Wood-Harper, 1996; Donnelly and O'Keeffe, 2013).

During our action research process we took these critics into account and tried to establish reliability and validity for action research as a useful framework within living lab research: We recorded events in two ways: (1) we questioned our panel members about the operation of the living lab after every research step of one of the three living lab projects, (2) we took notes, pictures, quotes,… during the co-creation sessions organized during the third phase of our action research process (n=20). We strived for validation of our focus groups by means of validation surveys, a practice we already use during "regular" living lab research projects. During the "practical phase" of our action research phase we asked our panel members for feedback in a validation survey (n= 346). Triangulation can also be a way to cope with critics on action research (Donnelly and O'Keeffe, 2013): we checked data from multiple sources for consistency, asked the questions in various ways, noticed that the needs were the same in the different projects,… This is also something we do during living lab research projects: we combine insights from different research steps to create a valid feedback on the innovation our panel members tested.

In many ways the process of inquiry is as important as specific outcomes. Good action research emerges over time in an evolutionary and developmental process, as individuals develop skills of inquiry and as communities of inquiry develop within communities of practice. It leads not just to new practical knowledge, but to new abilities to create knowledge (Reason and Bradbury, 2001).

CONCLUSION

Instead of holding on to a positivist approach focusing on objectivity, unbiased researchers and reproducible findings (Reason and Bradbury, 2001), (living lab) researchers should be open minded for more practical approaches. Living lab researchers are striving to investigate overarching research questions working in a project based living lab environment. Action research can be a useful framework to do so. The combination of a living lab as an environment and action research as a methodology results in the fast capitation of frustrations on the one hand and the co-creation and implementation of practical solutions on the other. In this case an overarching research question was "how to improve the operation of iMinds Living Labs". We implemented action research in this way that users themselves became part of the reflection process. Also, being a participating researcher ensures you experience the same frustrations or at least recognize the mentioned frustrations by other living lab participants. Another advantage of being an action researcher, is lowering the threshold for other panel members to give feedback. Your position as researcher gives you a trustworthy position and as a researcher you understand what they are talking about in a more profound way.

In other words, using action research as a framework to evaluate the operation of our living lab was an interesting exercise. By implementing the more practical view on action research from Norton (2009) in the more theoretical approach of Ståhlbröst (2008), we were able to create a framework which was suited for an evaluation of the operation of our living lab by our panel members themselves. We would not have discovered our main findings without this approach: (1) our panel members want to distinguish their role within the innovation process in a more obvious way, (2) they expect the innovation to be adjusted according to their feedback and (3) the panel members expect they are testing innovations which are not finished yet. Also, by combining action research processes and living lab methods we were able to strengthen both: the action research was a useful framework for the overarching quest for feedback on iMinds Living Labs by its own panel, while the living lab methods were cleverly used to contradict prejudices against action research. The panel members themselves felt involved in our general operation because they were asked for this type of feedback, probably indicating an extra intrinsic motivation to be part of the co-creation sessions and fill in the survey. Action research is also a very interesting framework when you are looking for practical outcomes, in this case the co-creation of a website by means of mock-ups. Hence we can state that we invited our experienced panel members to participate in a "action design research". They were able to reflect on their own participation in the living lab and came up with proposals for changes or solutions.

Action research can have some stumbling blocks: it is tempting to "act" like one of the panel members themselves (Baskerville and Wood-Harper, 1996; Baskerville and Pries-Heje, 1999; Donnelly and O'Keeffe, 2013). The biggest catch is to stay more or less impartial in this situation and try to avoid not to push the panel members towards delights, frustrations or solutions you are thinking about yourself based on your own experience. You have to be careful to stay impartial enough and make other panel members feel at ease when giving feedback. It was very useful to take the critics into account during the research period, although it was not always easy to note down every insight in a structured way. Perhaps more research on a more detailed framework about methods to use during the "practical part" of the action research process would be interesting.

BIOGRAPHY AND PHOTO

Sara Logghe achieved a master's degree in History (2011) and a master's degree in Communication Sciences (2013) at the University of Ghent. In her thesis Sara conducted research on the potential of social media for cultural institutions. During three months, Sara was an intern at iMinds Living Labs. This internship encouraged her interest in living lab research. In May 2013 Sara started working as a living lab researcher with iMinds-MICT-University of Ghent. Her research focus is on cultural living lab research and the changing library landscape.

dr. Dimitri Schuurman holds a Master's degree in Communication Sciences (2003) from Ghent University and joined the iMinds research group MICT in 2005. In 2009 he joined iMinds-iLab.o (also known as iMinds Living Labs) as a researcher for the Digimeter-studies, a yearly survey of a representative sample of Flemish people enabling on overview regarding (new) media trends, habits and practices, and as principal researcher for the Flemish ICT Living Labs Mediatuin and LeYLab. Based on the lessons learned of these ICT Living Labs, together with his iMinds colleagues he developed a specific Living Lab offering targeted at start-ups and SMEs, in which he has managed over 50 innovation projects.

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