
Challenges of Long-Term User Involvement in a Living Lab

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Abstract

In this paper we present insights from our Living Lab in the area of home entertainment, with 27 participants from 16 households, over a 2.5 year period. We will show that this kind of long-term participation of users in development and evaluation of technology, involves various challenges over the duration of the project. We will highlight several aspects that need to be considered carefully when setting up such a Living Lab.

Author Keywords

Living Lab, long-term study, domestic domain

ACM Classification Keywords

H.5.m. Information interfaces and presentation (e.g., HCI): Miscellaneous.

General Terms

Design, Documentation, Human Factors.

Introduction

Designing technology for the home is a challenge. Entering the domestic field for research requires one to be sensitive and empathic when dealing with the users. It needs a gentle approach using the appropriate methods for getting an in-depth understanding of the users (e.g. [6]), exploring new design ideas with them (e.g. [1]) and investigating appropriation processes in

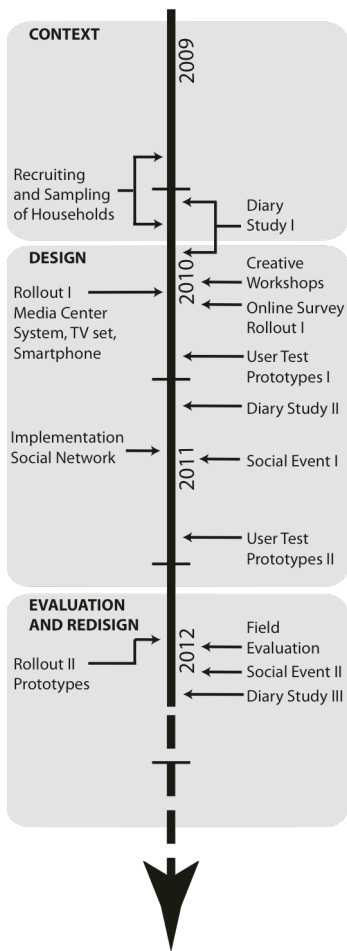


Figure 1: Overview of the project's progression (left side: interventions within the field; right side: applied research methods)

real life contexts (e.g. [4]). It also raises issues concerning suitable users and the time of user involvement [7].

One approach that deals with these issues are 'Living Labs'. They are open innovative research frameworks with a strong focus on user-centered research methods for "sensing, prototyping, validating and refining complex solutions" [2] in real life contexts [5]. Users take on an active role in co-creation of the design process by providing ideas and experiences from real use contexts and stimulate research due to long-term involvement. Although Living Labs make a strongly differentiated usage of their characteristics [3], these are the strengths of the concept, but at the same time they are also the challenges when designing technology for the home.

Social Media Experience and Design Lab

Our experiences are based on a 2.5 year period of a 4 year Living Lab research project. The aim of the project is to develop cross-platform concepts for TV, PC and smartphone that support a more flexible and integrated media consumption and the use of social media applications. Motivated by this, we designed a Living Lab research framework and involved stakeholders from the industry, academia and participating households. We named it Social Media Experience and Design Lab (SMEDL), because user experience and the design of home entertainment concepts are strongly related to each other. For a close collaboration with users in their real life environments and their continuous involvement in the design process during the entire research period (from gaining context understanding, establishing personal relationships via creating ideas and designing adequate applications

through to insights in appropriation processes), we used two different environments: a real world test bed (SMEDL.Local) consisting of 17 households from the region of Siegen, Germany and an artificial lab setting (SMEDL.Stat) at our university. SMEDL.Local makes up the unique core of our Living Lab. It provides an entry into the domestic field to explore media usage behavior and social practices, the integration and appropriation of new hard- and software as well as changes from long-term field studies. It consists of 27 participants (14 male, 13 female) who could apply via an online questionnaire and were then selected after individual telephone interviews. Our Living Lab consists of diverging household structures with higher and less technically experienced participants.

Figure 1 gives an overview of the different project stages and its applied research methods in SMEDL. After compiling our sample, we started a diary study with subsequent interviews, focusing on exploring and understanding current media usage behavior and social practices in domestic environments. To investigate changes in media usage behavior, this study was repeated annually. In a further step, households were equipped with various devices (TV, Media Center system, smartphone) to familiarize them with current marketable hardware and to set up a platform for the later developed prototypes. During the design stage, we conducted two creative workshops and two user tests in SMEDL.Stat and developed first prototypes. Following this, the prototypes were introduced to our households and we collected insights concerning appropriation in a first field evaluation. Besides this formal procedure, we organized informal get-togethers (social events) to build a motivated and strong user community.

Challenges when setting up a Living Lab

Below, we will present and discuss the challenges identified from our Living Lab concerning long-term user involvement.

How to find the right users?

The selection of participants for our Living Lab entailed various challenges. In retrospect, we have to admit that our combined approach of an online questionnaire and telephone interviews was not the right way to proceed. A more personal face-to-face interview in the applicants' homes might have given us some better indication about the participants' appropriateness for the project concerning their interest in the research topic, social competence, self-reflection skills, the domestic setting and their willingness to give researchers a deeper insight into their own and their family's life. We had a good experience with our heterogeneous sample of participants in the preceding design steps, e.g. empirical studies, PD workshops and user tests. Especially during workshops, non-experienced users contributed many interesting and innovative ideas, precisely due to their lack of knowledge about marketable technology.

How to keep users motivated?

Retaining participants in a Living Lab over a long-term period is a big challenge. While changes in participants' routines (e.g. workload, relocation, family status) are inevitable and may result in having to leave the project, a decreasing motivation is also an important aspect that may influence a premature departure. Concerning stability and usability of the rolled out prototypes we could not fulfill the users' high expectations in our applications. Although we never promised any stable and market-ready product, some users were bitterly

disappointed by the results. We dealt with the reasons for these expectations and identified four essential aspects:

Comparing with other products: When we rolled out the devices, we installed a mature Media Center application (Windows Media Center) on the users Media Center system to introduce users to current marketable solutions. Non-experienced participants were pretty excited by the system and its 'new' features and quickly adopted them into their daily media usage. As it was not the aim to re-implement an existing system, we focused on the relevant basic features. For the users it felt like a retrograde step, as many features they had grown to like were not available in the new system.

Watching TV is relaxation: Most of the participants watch TV in the evening after work or on weekends and its purpose for relaxing is an important user experience for them. As the stability and the handling of our prototype was still immature, the system needed to be restarted after a crash and the response of the UI was also not as expected. The effect was that the users could not relax as they wanted and they quickly switched back to their previous solution, which underlines the challenges of the domestic domain.

Waiting period: During the implementation of the prototypes, the users had almost no insight into the stage of development. Due to the long wait, they expected something huge. However, most of the implementation work we had done went into the development of the underlying framework and had no immediate effect on the user interfaces. Thus we determined a great disappointment on the part of users when they finally came to use our prototypes.

Missing benefit: Several participants mentioned that the prototypes did not provide any apparent benefit with regards to their previously used solution. In the case of social network functions, for instance, this turned out to be quite a dilemma, as our small sample could not make maximum use of them. Also, some users failed to identify some of the new features. In context of sustainable research it could be helpful to integrate well-established systems or features.

How to build trust relationships?

The living room is a private place, where residents feel secure and where they relax. Entering the domestic domain for research requires one to be sensitive and empathic when dealing with the users. Furthermore, to make users open up to the researchers is a skillful business and we should not underestimate the need of having good social skills as a researcher as well as participants. Our experiences have shown that both formal and informal communication as well as specific empirical methods are of importance in this context. While interviews are always purposeful from the point of view of the researcher, these purposes are not necessarily shared by interviewees. We learned over time the need for a relaxed, friendly and 'social' attitude on our part. In doing so, user motivation was positively influenced as well.

How to coordinate the collaboration process?

The coordination of several collaboration steps, e.g. workshops, user tests, interviews etc. turned out to be rather time- and resource-consuming. We often had problems making appointments at the university or the participants homes and it was impossible to bring all 27 participants together at the same time. However, appointments were also often cancelled right before the

meeting or participants did not appear or were not at home. For example, one household failed to turn up for a date four times. This often led to delays in the project progression and should be considered in the planning process. Unpredictable technical problems, device errors and other external influencing factors were additional barriers with which we had to deal with in a real world context. We always tried to fix problems as soon as possible. While most of the households appreciated that, some of them saw us as a 24/7 help-desk and called us in all urgent and less urgent cases.

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