Steps toward a Living Lab for SocialMedia Concept Evaluation and Continuous User-Involvement

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ABSTRACT
Involving users in the design and evaluation process of new technical artefacts is a fundamental approach in building usable and acceptable applications and services. To conduct such studies in realistic settings, the Living Lab methodology has been established over last few years. In our research work we established such a lab in a local area with the intention of building a foundation on which to evaluate ideas and prototypes around the Social Media topic. In this paper we describe our approach and point out issues that occurred within the build-up process. Crucial aspects include the selection process, the organisation and especially the question of how clusters of households can be built.

Categories and Subject Descriptors
H.5.1 [**Multimedia Information Systems**]: Methodology

General Terms
Design, Human Factors, Theory

Keywords
Living Lab, Participatory Design, Social Media

1. INTRODUCTION
In several studies on participatory design different modes and levels of participation are described [2, 10, 12]. Traditional techniques include interviews, surveys or questionnaires. In the 1990's alternative techniques like observation and video analysis emerged. Such 'contextual' techniques help to better understand users' demands within the practise. While traditional techniques can be used anywhere, the contextual techniques have to be applied in local 'real life' contexts [12].

Knowing of the importance of such contextual techniques, such approaches can be applied on different levels of product design and evaluation. Fischer and Scharff [6] distinguish between 'design-time' and 'use-time'. They point out that problems in the subsequent usage cannot be completely anticipated while designing a product. Users will discover mismatches when they actually use the product. To understand the full scope of user demands and needs it is important to involve them in the design process as well as in the use of new technical artefacts. Sleeswijk Visser and Visser [17] also argue that the same users should participate at all the different stages of the design process. Such 'returning participants' would provide more effective feedback, because they already have a relatively deep understanding of the application's concepts.

While the previously mentioned techniques for involving users can be applied on different stages in the development process, a meta-approach called Living Lab evolved over the last few years. 'The Living Labs Concept refers to an R&D methodology where innovations, such as services, products or application enhancements, are created and validated in collaborative multi-contextual empirical real-world environments' [5]. In order to get a deeper understanding on how users perceive new technologies, functionalities and services, it is important to evaluate them in real world settings. In principal, there exist two main approaches for the institutionalization of such a lab. On the one hand a Living Lab can be conceptualized as a controlled lab, which is designed like a standard domestic environment. Users are invited to visit or to live within the lab to test new products in early design stages. On the other hand the second approach focuses on involving real households by bringing new design studies into the practise.

Right now there exist several workings, which discuss the Living Lab approach for professional as well as for domestic domains. Schaffers et al. [14] uses the approach for enhancing collaboration in professional communities. Schuurman et al. [15] for example had done a SWOT analysis for the Living Lab approach in the context of MobileTV environment. However, till now fewer workings explored the lab approach on a macro view. By using the term 'marco', we are referencing research questions that strongly are related to the build-up process and the operationalisation of such a lab. Relevant questions here include: How to choose the right households for the lab? What motivates the households to participate? What problems occurred over time? Within this paper we provide preliminary answers to those questions.

Before we explain each part of our lab in more detail (chapter 3), we briefly provide approaches in realizing the implementation of a Living Lab (chapter 2). In chapter 4 we present findings we gathered and reflect on the difficulties we had to deal with.

2. LIVING LABS
As mentioned by Niitamo et al. [11] the concept of Living Labs is a quit novel topic, which requires substantial research to optimize its operations and methods. Living Labs can be generally understood as the ability to bring user, technology and business into an open innovative development process that establishes real life environments [11]. The concept supports long-term cooperation, co-creative research and development by involving at an early stage the user in the innovation process for 'sensing, prototyping, validating and refining complex solutions in multiple and evolving real life contexts' [4]. The long-term cooperation between

reseachers, companies and end users distinguish this concept from other approaches, which revert to tradional methods. Living Labs offer the possibility of capturing user experiences for innovative ideas and these labs also gain relevant information on how users utilise media in home settings or everyday life. In this regard heterogeneous empirical methods have been applied to studying behaviour and media usage.

In previous studies the approach was applied in professional as well as in domestic contexts. Schaffers et al. [14] describe their experience gathered by evaluative collaboration platforms for professional communities (e.g. for researcher or small businesses). Living Labs with the aim of developing home entertainment, technologies or communication concepts adopt the real life environment concept in two different ways. On the one hand controlled living space is constructed in test centers. For example the researchers of Massachusetts Institute of Technology (MIT) built up the PlaceLab within ubiquitous technologies could test in the home setting [9]. This lab consists of a completely functional apartment. They benefit from multi-oberservation over a longer period of time. On the other hand Living Lab approaches evolved which do not construct artificial real life environments. Such labs use the everyday life and given situations to involve the user into the innovation process. Within the city of Oulu (Finland), for example, a testbet was established for accessing new services via mobile devices [1]. The project 'iiTV@Home: Field trial in Salzburg' adopted the Living Lab concept to get a deeper understanding of the social dimensions of households for developing future iTV services [13].

3. SOCIALMEDIA EXPERIENCE AND DESIGN LAB

The work described in this paper is related to a three-year long research project called SocialMedia. In the project we develop new community concepts for cross-platform environments (including TV-, PC- and Mobile-based ones). Aside from the technical aspects, we are building up a Living Lab for continuous user involvement and evaluation work. While both lab approaches mentioned in the introduction (artificial home lab vs. real households) have their strengths and weaknesses, we decided to focus on a multidimensional approach (see chapter 3.2). Our lab is called SocialMedia Experience and Design Lab (SMEDL), because experience and design will go hand in hand by developing new applications and services for the home.

3.1 Prestudy

Before we started the build up process for SMEDL, we conducted a prestudy to get a better understanding of difficulties and problems while working in the field. For the prestudy we had chosen 9 households with 17 participants altogether. The age of the participants ranged from 10 years up to 45 years. Some participants lived in a flatshare, some lived alone and some lived with families in households. Within these households we had done a diary study (which lasted between 2 and 4 weeks) and short semi-structured interviews (about 10 minutes). Additionally, we conducted workshops with two of the families, which lasted around one hour each (one with five persons and one with three persons). While the main goal of this prestudy was to evaluate the diary approach (results already published in [8]), we also identified additional insights related to the Living Lab topic in more general, which we reflect also in the discussion session.

3.2 Approach

For SMEDL we had chosen a multidimensional approach consisting of three parts. The main part is a local real-world testbed for long-term exploration and evaluation of cross-community concepts in a rich media environment (SMEDL.Local). The second part is a stationary controlled testbed (SMEDL.Stat). SMEDL.Stat is constructed exactly like a domestic living room (see Figure 1). Within this environment we can measure user feedback and gain quantitative data by logging the use. In contrasts, SMEDL.Local as core of our lab is a non-artificial testbed whose focus is on the evaluation of current media use and new media concepts with qualitative as well as quantitative methods. Users of SMEDL.Local will be equipped with new technologies (Media-center PC, Smart Phone), which should be integrated into daily routines. Figure 2, for example, represents the situation of watching TV by using a media center system in a real world domestic environment. SMEDL.Global as third part is an online platform that enables remote participation and concept evaluation by web communities. In a later stage of our project we want to access existing communities (e.g. Media Center expert groups) to evaluate our prototypes also in a broader sense.

Figure 1. SMEDL.Stat for quantitative evaluation

Figure 2. Testbed - TV reception in a living room

The testbed will be separated in two domains, which is characteristic for our approach. One domain includes participants who already have closed social relationships to other households within the same cluster for all intents and purposes to evaluate community concepts, e.g. chat while watching TV. The other domain includes several households, which have no prior knowledge of each other. Within this domain we will evaluate new concepts for community building and getting new contacts.

During the entire research period we will use the domestic lab to collect new ideas from the users continuously, involve them in iterative design workshops with paper mockups and evaluate early prototypes in a qualitative and quantitative manner. Within our labs we use a broad range of different elicitation techniques. But in early stages of the build-up process, we make strong value of self-documenting methods. For this approach we use probes [7] as well as diary studies [3]. By using the diaries, the participants from a prestudy already gave us valuable insights into their social practise around media consumption [8]. Based on previous findings we have further improved upon the diary approach. For the current version we included so called 'action cards' (regional and national maps), which help in understanding social networks of household members. Participants could assign where family members or friends are living and how they keep in touch with them. Out of these findings, new households for SMEDL.Local could continuously acquire.

3.3 Participants and Selection Process

The acquisition of households started with the call for participation. It was announced in the local newspaper. Also the local radio stations reported about the study via online questionnaire in the ensuing two weeks. Followed by telephone interviews, more data about households, media usage and technical equipment were gathered. In the following we structured households into four categories: couple (without children), families (with children), singles (without children) and single father/mother (with children). Because time and budget is limited as in any other research project, we had to define a target size for the sample of SMEDL.Local. As a benchmark we decided to involve 20 households in the final stage. By knowing that such an approach can't be representative in an all-embracing way, the process of choosing the right household was an important step. Because the candidates for the lab don't know each other, we decided to choose a cyclical dynamic build-up. As a starting point, we had chosen 9 households with 19 participating household members (10 female, 9 male) for the core group. The aspects on which me made these decisions are: choose at least two representatives from the defined core groups; chose one of them with more technical skills and manifold media use and one with less technical skills and limited media use on basic functions (the classification to the categories based on the statements and results from the telephone interviews). Every single household had at least a TV, a mobile device and a PC or Notebook, but only five of them were in possession of game consoles. Almost all eight of the nine households spend time in non-profit or local associations. Households are all located in a local district to guarantee problem-free support. People participating in our study ranged from 13 to 52 years of age, with an average age of 32.8 years. More than the half had a very good education (high school or university) and a minimum monthly income. They represent a typical sample of this region [18].

4. INSIGHTS AND ISSUES

Over the course of time we gathered valuable insight and also were confronted with several issues. In the following chapters we describe the motivation of the participants for attending the lab (chapter 4.1), the issues around the relationship within clusters of households (chapter 4.2) and other crucial aspects (chapter 4.3).

4.1 Motivation

Describing and understanding the motivation of the users is an important factor in reflecting on the whole Living Lab approach. In the application form we prepared a free text form input field, enabling the applicants to describe their reasons for participation. 32 out of 33 attendees gave us information this way. We classified the feedback into the following classes: curiosity ('try out new things', 'using the new efficient in daily life and work', 'getting in contact with new technology'), self reflection ('we are very interested in data which relate to our usage of new electronic media', 'we are excited how new technique will influ¬ence our media usage'), connectivity ('getting into contact with others by using several communities', 'usage of new networks', 'better connection to friends and family'), participation ('bring in my own visions', 'provide new ideas'), learning ('insights about the connectivity of television, Internet and telephone', 'updating my technical skills') and support of research ('support research', 'hope to bring in my part in the research project and to be helpful'). We considered the feedback as an important but lower-ranked aspect in the selection process of the lab participants. Additionally, the impressions from the telephone interview were considered as well. In the last part of the semi-structured interview, we asked participants whether they are willing to provide continuous feedback, conduct monthly interviews and are willing to visit the university.

Keeping up the motivation of every single household member over time is a challenge especially in the beginning of the lab studies. For the first months we put our focus on prestudies and interviews to understand current media usage and needs for new functionalities. The participants on the other hand asked for new gadgets that they can dry out immediately. But because technique and the prototypes will be installed at a later date of the project, it is difficult to get the same level of motivation over time. Furthermore some members of the household are more enganged then others. Compared to short-term user-centered lab studies (see e.g. [16] for an overview) these are central aspect, which demands high attention. From our point of view a good and trustful relationship between tutor and the participants is the most important condition to support the long-term cooperation.

4.2 Dynamic Build Up

Within the SocialMedia project we develop new community approaches that reach two goals. On the one hand we will support existing communities by sharing content with each other. On the other hand we also want to support community building with people who do not necessarily know each other. While the second mentioned aspect can easily be considered by acquiring people from scratch, the first one is related to different issues. All of the households that applied for our lab are separate entities without any connections amongst them. But for evaluating new approaches whose main goals are the support of exiting contacts, clusters are needed with persons/households who already know each other. In an early prestudy we made workshops with participants of two households. Here we asked participants directly whether friends or other contacts of theirs would be willing to attend the lab, too. In reference to our local approach finding friends willing to participate was not as easy as thought because of two main reasons. On the one hand participants uttered doubts that their friends and colleagues are interested in trying out new technical artefacts in the same way as they are. On the other hand it became clear that many potential candidates are located far away, outside of the local testing area.

In order to explore existing contacts, right now we are evaluating a media diary to identify connections to others. The diaries were designed and cyclically improved based on the feedback we gathered in a previous study [8]. From the prestudy we know that we can gather numerous insights this way. Within the diaries we found entries as 'watching with my mother', 'guessing with friends' or 'found an old colleague on wkw (a social network site)'. Such notes are a good indication for seeking out potential members for the lab clusters. However, with such diary entries, we can't get insight into the whole network and the different levels of intimates. So we decided to develop our media diary even further. Within the diary we placed 'action cards'. On such cards maps from the local city, the whole state and the whole world are drawn. On these cards participants can sketch contacts and describe how they keep in touch with them. We expect to get broad grounds for discussion this way and hope, additionally, to find interested parties based on these results.

4.3 Other Aspects

Within this chapter we describe related aspects that become important for the lab approach. An interesting finding identified in the prestudy and confirmed in the current state is the presence of a promoter within the households. In the case of a single household, the person who applied is the promoter in a trivial sense. But in the households with families or couples, there is always one person who pushes the process of participating in the lab forward. This person in some cases is the father or the mother and also other persons (e.g. the son), who live in the same household. In any case the promoter asked other members of the household for permission to apply to the lab. Further in the process, the promoter acts as the contact person who arranges appointments, enters the household, etc.

From time to time some difficulties became apparent. One of the difficulties is to fix an appointment with all members of the families the same time (e.g. with the intent of conducting a workshop). In comparison to other situations (e.g. flat mate with weak support from others), having a strong promoter provided us with much easier access into the household. On the other hand it is also of importance to build up a relationship from the researchers' side carefully. Changing contact persons will lower the acceptance this relationship. In one of our cases, a household was contacted several times by different persons (for research as well as for teaching reasons). After a while this household dropped the study. A fixed contact person is a much better way than having various persons contacting households from several sides.

5. SUMMARY

In our work we reflect on first insights gathered by operationalizing a Living Lab with real households. While in previous work the lab approach is mainly described on a micro view (kind of labs, pros & cons etc.), we describe our findings in a bottom-up way. Within the build-up process, we identified several issues that have to be considered for further work in the field. Besides issues that are related to the selection process and organisational aspects, we draw attention on the build-up process of networks. Finding individual persons/households from scratch is a relative easy and straightforward process. But for the design and evaluation of social applications, clusters of households are needed that know each other already. The important aspect of user motivation also became visible in our study. While our research work is focussed on formalized prestudies initially, users want to try out new functionalities immediately. Continuous feedback and a trustful relationship between tutor and households are necessary to keep long-term cooperation running.

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