Comment Cards, Home Sketches, and Family Personas. Eliciting Experiences with Home Technologies.

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Abstract

Learning about what makes "good home automation" is challenging, when very often it means that technology and its actions should remain unnoticed. In this position paper we describe how we conducted our research on smart home inhabitants [1] in order to learn about good and bad experiences in their everyday life with automation to inform the future design of such technologies.

Author Keywords

Home automation, Smart Homes, User-centered design.

Introduction

It is very difficult to predict the success of home automation technologies from research only conducted for a short time in a lab. But interviewing people living in automated homes "in the wild" has its challenges as well. Despite exciting visions of smart homes, everyday life with home automation can be mundane and many aspects are simply not memorable enough for inhabitants. Still, we think that understanding smart homes in the wild and the long term experience of current inhabitants better is crucial to design technologies that truly support and facilitate everyday life.

Families living in automated homes often have members with varying levels of technical skill, some of whom are capable of configuring and troubleshooting the technologies, and others who have little expertise with the systems [1]. In our research we are currently focusing on smart home inhabitants who do not have a technical background. We picked this group of inhabitants because a) often they are the household members who spend the most time at home, b) current smart home interfaces address their needs and expertise the least, and c) we think that if we can design smart home interfaces to their needs, chances are good that other household members will make use of them too.

In the remainder of this position paper we report on our experiences when interviewing smart home inhabitants and how we plan to take our study results into practice.

Learning about everyday experiences

Interviewing inhabitants of "bad" smart homes (i.e. home automation that does not work as expected or needed) can be very exciting. Such participants have many stories to share and they are more than willing to tell them in detail because of the frustration they still feel about situations in which they were helpless, confused or even angry at the technology. Interviewing inhabitants of "good" smart homes is quite challenging. especially, when the interviewees are not interested in the technology itself. Often they are not aware of their interactions with the technology anymore because it acts in the background and inhabitants do not consciously notice its influence in everyday life. This absence of awareness makes it even harder for researchers to understand specific reasons leading to such a seamless integration. We therefore designed a series of exercises and probes intended to help elicit and collect participant experiences with their smart homes in greater detail.

Good home automation often also implies that it requires little conscious interaction. In some instances the last interaction participants reported having with their smart home interface had taken place several weeks before we talked to our participants. In order to collect several instances of interactions we asked them to fill out comment cards (see Figure 1) whenever they thought about or noticed the automation or its effects. These comment cards have several check boxes that are labeled with potential beginnings of sentences (e.g. "It's great…" or "I don't understand…") to facilitate expressing emotional responses and to minimize participants' effort.

Figure 1: Participant Comment: "It's great…the way automatic watering system in our garden works. It starts exactly before the sunrise, saves my time and it is hidden in the grass as well. It is a miracle!"

It was not only difficult for our participants to remember instances of interactions, but it was also just difficult to remember the various devices or functionalities present in their homes. A sketching task (see Figure 2) that we originally introduced to get a better idea of

their mental model of their "smart home" actually turned out to be a good refresher for them so they were able to think about more functionalities of their home.
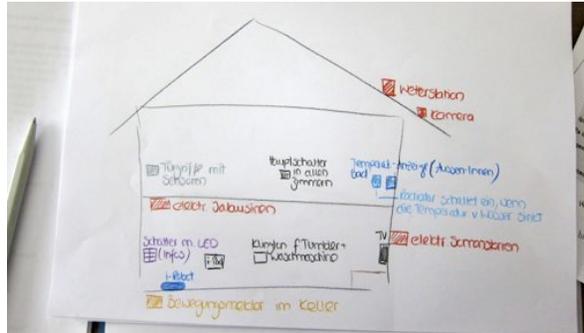

Figure 2: A participant's sketch of her home labeling the various smart functionalities and devices.

We provided the following task description to our participants. "*Create a representation of your home that embodies how you think about your home. Illustrate what you think is 'smart' about your home."* While the questions was kept very open most participants decided to sketch some kind of (floor) plan. For two participants home tours were not possible. In those cases the floor plans provided spatial context and supported the understanding of participants' descriptions in the interview.

Personas and Their Everyday Life
Currently, as we transition into the design phase of our research project, we are developing personas (see Figure 3) derived from our participants and their family members and hypothetical schedules of their days. We intend to use these to help evaluate our design ideas in regard to how they would support our target users and how they might interfere with other members in the same household with different needs. The set of personas and schedules may also be valuable to help other HCI researchers and designers to think about limits and suitability of home technology designs by walking through a representative day.

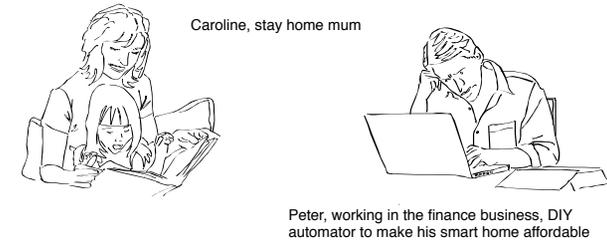**Rizzo Family: Caroline, 37 and Peter, 38 with 2 yo Carla and 5 yo Stella**

Caroline, stay home mum

Peter, working in the finance business, DIY automator to make his smart home affordable

Figure 3: "Rizzo Family": sketches for a family persona

Discussion
We have not put the family persona based evaluation and the additional persona material to practice yet. Therefore, we would be very interested in discussing it with other researchers in this field and learn from their methods. As we plan to deploy our prototypes into several homes we are also exploring quantitative methods to study user experience with home automation. It would be interesting to share our ideas and to hear about the lessons other researchers have learned.

References
[1] Mennicken, S., and Huang, E. M. 2012. Hacking the natural habitat: An in-the-wild study of smart homes, their development, and the people who live in them. In Pervasive 2012.