interLiving: a co-operative design approach

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ABSTRACT

In this position paper we describe how experience from a ICT research project, interLiving, can influence HCI education. The project also raises interesting aspects on the role of design research. The interLiving project is an example of a successfully conducted cooperative design process and could therefore have impact on both HCI and design educations. These impacts could influence the view on multi-disciplinary work, participatory design and what methods to use.

This is a research case study that can be used to show how fruitful close collaboration between people with different background can be. It also shows that it is equally rewarding with close collaboration with users. We believe that this experience can have great impact on HCI and industrial design education.

Author Keywords

Cooperative design, user-centered design, education, methodology, design research, design process, multi-disciplinary, ICT, HCI, computer science, industrial design, ethnography, cultural probes, prototype, workshop.

ACM Classification Keywords

H5.2. Evaluation/methodology, Prototyping, User-centered design.

INTRODUCTION

One of the most common models of a design process is the waterfall model where different activities are performed in sequence, i.e. first studies, then design, programming and finally testing. The research project interLiving used a different approach where instead people with different background worked together throughout the whole project.

The role of the user is also a debated issue. Should the user be involved near the end and "test" the application? Should

the developers be regarded as "experts" and users only be treated as customers? The interLiving project had users involved throughout the whole project.

These and other experiences from the interLiving project provides HCI education with interesting aspects of how to conduct a design process. Some of these aspects are:

- How to cooperate with people from different backgrounds
- Cooperative design
- The range of methods available

INTERLIVING

interLiving, "Designing Interactive Intergenerational Interfaces for Living Together", was a three-year project, 2001-2003, funded by the EU Future and Emerging Technologies, initiative the Disappearing Computer [1]. The research was conducted both in Stockholm, Sweden and in Paris, France. The researchers were from many different disciplines, ethnography, psychology, computer science, industrial design, interaction design, etc.

One of interLiving's objectives was to develop artifacts that use information technology to facilitate intergenerational communication within families.

There was no specific problem, solution or technology in mind from the beginning. How could we find out what to do? How could we get hold of the design ideas that would be reasonable to develop?

Another of our objectives was to try out, modify and describe different methods for co-designing with persons in such a 'private' setting. We wanted to develop methods that let the family members participate and influence the design throughout the whole process.

We used the concept of 'family' to describe close relations spread over generations. The three Swedish families we work with are distributed in three households each. The participants' ages varied between one and 75 years. We worked with the same 30 people throughout the three years.

The researchers in Paris also worked with three families.

We will now first describe some of the strategies and methods we used. After that we discuss the impact this can have on HCI and design education.

Co-operation between different disciplines

interLiving was conducted in the Scandinavian design tradition and was multidisciplinary with researchers from computer science, ethnography, industrial design and psychology. The participants represented different ways to conduct research, design and technology development work.

We decided that we should work closely together continuously during the whole project. There should be no "handing over information" between ethnographers and computer scientists for example. At least two from the research team should be present at every activity where the users were involved.

Cooperation with users

We strongly believe that cooperative design is a successful approach. In interLiving this means expanding this field from mainly dealing with work related matters into families. We know that it is difficult for users to be innovative by just talking about what technology they want in the future. But on the other hand people can be very innovative when they are given the right tools and circumstances.

Several different methods

There are of course many different ways to conduct a design process and no approach can guarantee success. Little is actually known about where, why and when the ideas that lead to successful solutions appear.

Our approach was to use several different methods in trying to get to know the family members different needs and desires [9]. This approach is called triangulation [5]. We calculated that what does not show in one method would be revealed in another. And strong aspects would have impact on the findings from the use of several different methods. We decided to use cultural probes [2], workshops, observations and interviews. Of course prototyping was included as well. The workshops included the use of several different methods, like critical incident technique, low-tech prototyping and scenarios. We emphasized that the results should be shown in action.

After some time we also developed Technology Probes which are complementing Cultural Probes [1] [4]. These are scaled down, feature-slimmed applications that are on their way to become disappearing computers in the sense that 'we [are] freed to use them without thinking and so to focus beyond them on new goals' [8]. The technology probes gave us interesting information about the families' use of technology.

Prototyping

The future use of the eventual artifact was in focus during most of the work. We also worked directly with prototypes in the families' homes. We installed low–tech prototypes that were 'used' for some weeks. Following that we had workshops in the homes reflecting on the result. This step naturally gave us a lot of specific information about the use and context.

Later on in the process we installed software prototypes in the households. These were also evaluated in several different ways and thereby revealing important aspects of the peoples needs and desires.

'The practitioner allows himself to experience surprise, puzzlement, or confusion in a situation which he finds uncertain or unique. He reflects on the phenomenon before him, and on the prior understandings which have been implicit in his behavior. He carries out an experiment which serves to generate both a new understanding of the phenomenon and a change in the situation.' [7]

Process

Since understanding of the different aspects was a necessary ingredient we needed to work with researchers from several different academic professions together in all events. The probes were discussed and analyzed this way. The interviews were done by an ethnographer and an industrial designer. The prototyping work done in the families' homes was conducted by these two and a computer scientist. We worked closely together and minimized the usual sequential way where one person hands over the results to the people in charge of the 'next step'. The result of this was a greater depth of the investigated aspects and also in a better, and mutual, understanding. We worked together even during other phases, planning, workshops, etc. This gave us all the "same" experience about the three diverse families. We constructed a common ground to work together from in the development.

There were several sources of inspiration for this, partly experience from our own practice and horror stories about the lack of results from the 'waterfall' or 'toss it over the wall' way of working. We were also inspired by Henrik Gedenryd who stresses that 'design cannot be separated into stages.' [3]

IMPACT ON HCI EDUCATION

We believe that it is very important for HCI students to be aware of the advantages of working together with other disciplines as well as with users. There are several ways of doing this and it is important to realize what the strengths of the different approaches are.

Design, an intentionally, holistic driven approach

The participants represented different ways to conduct research, design and technology development work. One of the key aspects of design is that it is driven by intentions. Nelson and Stolterman define "… intention is not the target, nor the purpose, nor an end state, but is principally the *process of giving direction*.[6]". These intentions are guided by the experienced and imagined desires that the (future) users have. They are also guided by the possibilities and constraints that seem present. This is one of the important

issues why it is fruitful and important to work together and not in sequence. The designer needs to be informed about relevant issues by the HCI specialists and social scientists. The social scientists and HCI specialists will in their turn be guided by the intentions that the designer provides. Done well the whole team will together construct *shared intentions*. These shared intentions will have another key design aspect namely a holistic approach. Designers focus on that-which-is-desired and in prescribing that, focus both on the whole context and on the details.

IMPACT ON HCI RESEARCH

Although the approach used in the interLiving project proved to be successful there are naturally many issues that need to be researched further. Some of these involve development of methods and strategies. Other issues are trying to understand concepts like intentions, meaning, desires etc. better.

CONCLUSION

The fact that interLiving blended researchers with different backgrounds together with users in every part of the development process helped the researchers in understanding the users lifeworld better. This shared understanding resulted in shared intentions. Together users and researchers innovated communication artifacts that made sense to the users. This was done with the systematic use of a combination of diverse collaborative methods and repeated reflections. During these activities the focus was on descriptions that cover the whole context of real situations that made sense to the family members.

These insights may contribute to the development of HCI (and design) education in several ways. By learning this, hopefully through projects with students from other disciplines, the HCI students will have easier to decide:

- how and when to involve users
- when and where to collaborate with designers (and people from other disciplines)
- what they need to provide the designers with regarding constraints, context, framing, etc.
- what result or feedback to expect from collaborating with designers

We believe that the purpose of teaching design to HCI students should have the objective of facilitating their future collaboration with designers (and people from other disciplines).

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