Involving Families in a Design Process

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ABSTRACT

We present a method for analyzing user needs and defining requirements for the design of a prototype system for the management and exploitation of digital photo collections The method combines participatory design sessions with families and interviews realized at family homes. The paper describes briefly the overall process and shows how participatory techniques involving families as active participants made it possible to collect a maximum of data about the needs and expectations of users in a short period of time.

KEYWORDS

Participatory techniques, families, paper prototyping, scenarios

INTRODUCTION

Digital photography activity has a very strong social and familial aspect where sharing photos among people and communicating about the associated events and places take an important part. This has already been established through recent studies. For example, in [1] activities such as sending and sharing of digital photos online were analyzed among 11 families. The results made it clear that sharing photos in person with others is seen as a common and enjoyable activity, but that the PC does not constitute a convenient vehicle for that purpose.

This paper presents a method for analyzing user needs and defining requirements for the design a prototype system for the management and exploitation of digital photo collections. The system is based on a TV-based platform (multimedia set-top + hard disk).

The platform that our industrial partners chose for running the application belongs to a new generation of intelligent set-top devices which are, more than computers, oriented towards family use and strongly dedicated to entertainment. Designing an application for supporting photography management on such platforms makes it necessary to address questions such as the following:

- What are the main tasks regarding the management of family photo collections? Which are typically carried out together by several members of the family?
- What role could set-top platforms play in the management of digital personal photo collection?
- What are the main system functionality and interaction requirements needed to support the identified tasks?

The project partners had as an objective to integrating to their set-top device automatic functions based on image analysis technology. We were then expected to validate user interest in such functions for supporting photo management. Because interacting with TV-based devices for managing photos is novel for users, we also needed to get their feedback about the usability of this environment for supporting the required tasks.

For all the reasons mentioned above, involving families in our process was a necessity.

METHOD

The overall process aimed to facilitate adequate understanding of family practices about photography activity and allow us to deduce directions for the design of a future TV-based tool capable of supporting digital photo management and entertainment in the family context. The three month timeframe for the study objectives was short enough to favor methods offering a maximum of feedback from the users in a minimum period of time. For this to be possible, families had to be involved from the start as active participants in the process.

The proposed approach combines traditional interviews and observations realized at the family home with participatory design sessions where family members and project team members work together Each of these methods can only reveal a limited amount of information about users. By combining them, we count on the fact that the key elements not identified with one method will show up through the other. Furthermore, key elements identified jointly by the two methods indicate strong directions for design.

Participatory design is now recognized as a successful approach to the design of interactive technology, and has been carried out under various methods and techniques [2] [3]. Some participatory techniques have also been experimented with families in the context of designing information technology artefacts to be used in the familial context [4]. We then expected participatory sessions to give participants the opportunity to share their experiences about their photo collections with other families. We thought this would provide a favorable ground for individual as well as collective creativity by promoting discussion about new ideas and invention of new solutions.

To reach this goal, participatory techniques had to be carefully selected.. However, we expected field approach resorting to interviews and observation in each family home to be more appropriate for exploring the details of family photo practices.

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THE PARTICIPANTS

Our selection of families relied on some well defined criteria. All needed to have a strong interest in photos and have a familial tradition in photo collection. We also took care of mixing families having various degrees of experience in digital photography management. Our final selection included : one family that just started using a digital camera a few months ago, two families with one year experience in digital photo and two with several years of experience already possessing large collections.

We expect families not having much experience in digital photography to imagine more easily how photos could be managed on a TV-based platform, since they have not yet been conditioned by PC software logic. Such families would therefore not be inclined, like experienced users would, to mimic their current PC-environment photo management. They would express their needs more naturally without necessarily taking undue account of the constraints or the limits of existing environments. On the other hand, more experimented participants were expect to help us pin down concrete problems they had to struggle with in existing software, and possibly propose their personal views on possible solutions.

We also wanted to cover various family profiles, including different age groups. For that we involved: children, teenagers, young adults, some adults in their late forties as well as some in their fifties. Photo management is an activity that is often shared by family members. Making adults and children of a family participate in our study should allow us to see how they interact with each other in front of a system. We thought it important to involve children and teenagers because they tend to interact with the new technologies more freely than adults. They also generally adapt themselves more easily to new interaction styles. For these reasons, it was important to have their point of view concerning the photo management in a TV-based platform.

Five families, including various professional backgrounds (computer science, marketing, artistic domain, chemistry, tourist industry) were selected, two members of which would participate in the participatory design sessions.

The project team was made up of usability professionals one of which was specialized in TV interaction, and of a software engineer specialized in digital photo albums. During the working sessions, they mingled together with users in our work groups.

PROCESS

The short timeframe only permitted two participatory working sessions and one visit at each family home. The three events were carefully planned so that the findings of earlier ones would serve as input material for the following ones. For this reason, we carried out a round of interviews between the two working sessions. The working sessions relied on brainstorming exercises and scenario illustration by animation and interaction with paper prototypes. Some of the techniques are presented below.

First working session

The first participatory working session aimed to get the participants to know each other, and to build a group relationship based on a shared interest in digital photography. A second goal was to provide a relatively comprehensive overview of the activities relating to photos collections and to build a consensus about these activities. This session was also an opportunity to highlight some family-specific interests in management of digital photo.

Interviews

The goal of the interviews was to explore with each family his experience and activities about photo collections. They took place about one month after the first session and were based on the experience about photo activities that families had during previous weeks. We went further into each reported experience, examining in more detail the activities we had started to analyze during the first working session. We collected for example the problems they were facing in the organization, search, or presentation of their photos. We also observed families practices. They presented their photo collections and the way they were organized, explaining why they chose a specific organizational scheme, its advantages and its problems.

The interviews enabled us to meet with the other members of the family. Having each member explain his role in the management of photos made us understand the family dynamics and relations around the photo activity. We took advantage of being in the family home to investigate the possible role that a TV-based system could play in supporting photo activities. It was much easier for them to imagine the role that a TV-based system could play while they were at home in their usual environment including their own TV.

Overall, the data collected through interviews provided us with interesting questions about system functionality which served as a basis for the next working session.

Final working session

A final working session took place about three weeks after the interviews. The time interval allowed us to prepare a synthesis of the data collected. We wanted this last session to be based on that data because one of its objectives was to share with the group the different experiences, especially the family needs or difficulties about photos. We counted on the fact that sharing this information would provide a basis for generating and exploring potential design solutions within the group, especially for addressing the problems reported above.

This session also aimed to get participants understand more clearly how technology could help them in their photo management. We proposed to achieve that through exercises where families are confronted with the future system capabilities and work together on finding practical solutions to their problems.

CHOOSING PARTICIPATORY TECHNIQUES

In order to obtain the different types of results expected from each working session, we had to provide the participants with a dynamic and creative environment. To achieve that, the exercises had to be carefully selected to be diversified enough and stimulate the creativity of participants. To that end, we mixed standard techniques such as card sorting or information classification with more creative ones such as paper prototyping and scenario acting. We also mixed individual exercises with exercises involving the members of one family as well as members of different families. We now describe and discuss our choices by presenting some of the most representative exercises.

Individual exercises

We chose to include individual exercises so that each member of the family could contribute his point of view about a topic. This would help collect a larger variety of practices and requirements within the same family. Doing that, we also wanted to make sure that no participant would impose his opinions on others. For example we wanted to help children feel free to go against their parents' opinions.

Two individual exercises relying on standard techniques were scheduled. The first one aimed at building a consensus on the more interesting activities related to photo collections. We used a card sorting technique where each participant was invited to generate as many action verbs related to photo activity as they could. Verbs referring to the same activity were then grouped together in order to define a unique category (figure 1).

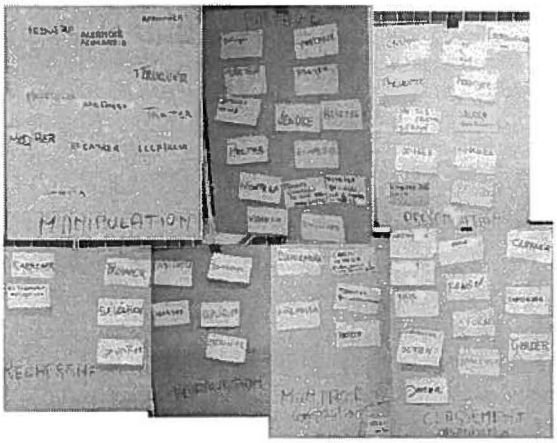

Figure 1. Each colored poster represents a photo activity with the action verbs associated to it

Another exercise was aimed at getting the opinion from each family member about specific high-tech functions that the developers planned to integrate into their future system. After presenting each function and illustrating it with an animated interaction, we asked each participant to score it.

These two exercises highlighted some differences in needs and interests between children and parents. They tended to focus on different activities and to be interested in different functions. Children appeared stimulated by the fact that their point of view was treated on a par with that of adults.

Family exercises

Exercises where members of a family work together were selected in order to help point out some sociological aspects of the photo activity. For example such exercises can highlight differences or contradictions within a family about the requirements toward the system. This is frequent between older and younger generations which tend to adopt different attitudes and interaction styles toward new technologies. Highlighting these differences would lead the design team to propose solutions acceptable to all users.

We relied mainly on scenarios and paper prototyping for these exercises. These are known to be good techniques for enabling participants to explore new concepts very early in the design process without putting undue effort on software development. At this early step of the design process no system prototype was available to allow families to experiment with a TV-based platform at home. We were then hoping that scenarios and paper prototypes would suffice to get an initial assessment of the interface envisioned for such platforms.

We set up two family exercises, one in each working session. Both exercises relied on creative techniques such as defining a scenario covering a specific situation or problem and illustrating it on a low-tech prototype.

The first exercise aimed at highlighting family-specific interests. Each family had to define a scenario corresponding to a situation that they really cared about. It could be a problem they faced, something they would like to do, or any other idea they had. Then were asked to illustrate it with low tech material we provided: magazines, post-its, paperware, illustrations of cameras, albums, screens, printers, etc. (Figure 2).

We observed that all the proposed scenarios were about activities shared by several members of the family, such as creating slide shows. Participants tended to illustrate collective rather than individual activities. This was expected since the exercise was designed to be realized by family members together.

Figure 2. Etienne, 10 years old, cut up some photos in a magazine while his father uses post-its to create icons

The second exercise aimed at having the participants evaluate the strengths and weaknesses of a TV-based platform in supporting their tasks. It consisted in designing and acting the interaction with the system using a paper prototype. In this exercise, we asked each family to work on designing solutions that support collective activities since we were interested in solutions addressing communication needs.

We observed that sometimes members of the same family did not agree on a solution. For example, for annotating photos, a teenager adopted a method similar to the one used for sending SMS on mobile phones. This method appeared unusable to his father who preferred a more classical method such as typing on a keyboard.

The use of low-tech prototyping techniques in family exercises allowed each member of the family to participate whatever his age and level of expertise. Children and teenagers felt comfortable and participants lacking experience with digital photo management proposed solutions that proved to be just as interesting as those of more experienced participants. This type of exercise being very lively, families had a lot of fun. It also brought families to communicate with each other since every one had to present and comment his prototype to others (Figure 3).

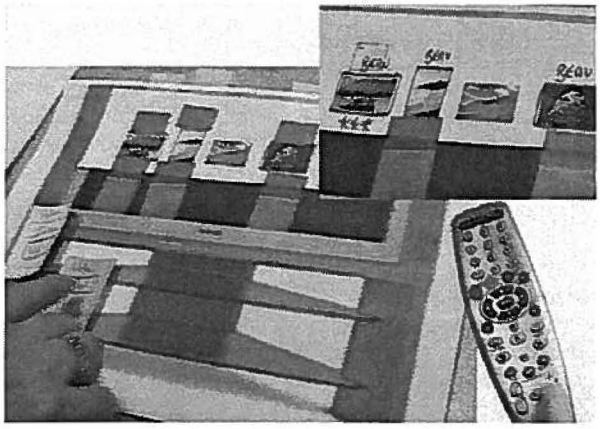

Figure 3. A user describes a scenario of scoring some photos

Finally, getting participants to work on task scenarios and design solutions out of their usual context prevented them from being influenced by the tools they generally used to manage their collections.

Exercises mixing family members and design team

We also included exercises where members of different families need to work together. These exercises were expected to facilitate communication of experience across families and provide for a rich exchange of ideas.

We organized three groups of four to five people: three members coming from different families, and one or two members of the design team. The groups were organized so as to make each person in the group feel at ease and participate. For example, the two teenagers were placed in the same group because they would share their experiences more easily among themselves than with adults. We also made sure that each group would include both beginners and experts in photo management.

Two problems were submitted to each group who had to imagine possible corresponding solutions. These problems were taken from the most common ones reported by the families during the interviews. This "brainstorming" exercise was animated within each group by a member of the design team. This helped stimulate the discussion when the group ran short of ideas. It was also an opportunity for the design team to submit solutions including functions that have been envisioned by the industrial partners and to get feedback about them from the participants. At the end, each group presented the others with one or two solutions for each problem.

Mixing family members was very positive since it led families to envisage solutions taking into account the other families' experience.

However, mixing novices and experts did not produce the expected result. We found that experts sometimes proposed solutions because they already thought about it before. In that case, novices tend to agree with it without trying to find alternative solutions. It was also difficult for novices to imagine a problem and its consequences when they had not already faced it. One possible reason is that the expertise levels of families within a group were too far apart.

LESSONS LEARNED AND CONCLUSION

Combining participatory design sessions with home inquiries was very efficient, each method collecting results that would have been difficult to get with the other. The overall process proved to be efficient in quickly identifying some important issues to be considered in designing a system for the family environment.

Participatory sessions, as expected, generated rich communication not only between families, but also with the design team. Techniques of scenario acting with paper-prototypes allowed the families to rapidly get into the project and helped them express their problems and ideas of solutions. They also enabled them to explore new concepts very early in the design process without putting any effort on software development. The families enjoyed this type of exercise and had a lot of fun participating in the working sessions. This made them very enthusiastic about participating to the following steps of the project.

However, even if the low-tech material used was realistic enough, paper prototypes had a limited power in allowing a real interaction feedback from users. A functional prototype would be required in the remaining steps of the process to achieve this goal.

One important aspect to consider in participatory design sessions is the organization of working groups and the choice of the exercises and working material. It is especially important to make sure that all users, regardless of their level of experience feel that their contributions are valued. In the case of children, it is best to have them organized into homogeneous age groups and activities should suit their age. In our case, one of the children was only 10 years old and could not understand some of the proposed solutions.

Diversifying the exercises helped produce a rich variety of data.

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