

PRODUCT DESIGN: DESIGNING WITH USER DATA IN MIND

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We study how designers work with information on product use. User research may be integrated in the design process of products to assist the designer in designing products for users, without users actually taking part in the designing. In two consecutive design workshops, we invited designers to work with us on a design task which included the user data. To engage designers, we presented visualized user data with quotes from users to designers in the workshops. This paper discusses how user data can be communicated in order to be taken up by designers and, if possible, be used as source of inspiration in the product design process.

keywords: usage research, emphatic design, product design

1 Introduction

There are some process models available that show how research on product usage should be integrated in a design process. They suggest various ways of mapping usage research activities onto stages of a standard design process (e.g. Den Buurman, 1997). Our research interest is to find out what actually happens in the interchange between the activities of researching and designing. What kind of information is exchanged, and how does the one activity influence decisions being made in the other? In previous work (De Jong and Boess, 2007) we reported a study in which we, three designer researchers, as a small design team collected information about product usage at peoples' homes. Our design topic was visual reminders (VR) in people's homes. We then exchanged the information about users in our design team and reflected on this particular process. Our aim was to find out how designers can engage with and be inspired by information about users. To increase empathy of designers the user data was exposed to the designers on cards with photos and quotes of users (cf. Black, 2003).

In this paper, our research question is how designers work with user data in their designing and whether the presentation format of the user data is appropriate for it. We analysed how the designers talked about (presumed) usage of design ideas and their evaluation of the cards and themes in the workshop.

In the discussion we will also briefly introduce the results of an expert workshop that was held at IEA 2006 with the aim to discuss different ways of communicating user data within the design process.

2 Design workshops

2.1 Making user data available

For our design workshops we made cards of user's homes with a quote from the user, see Figure 1. We collected the photos in themes, such as in sight/out of sight, need to

do/want to do, timing VR. We collected eight cards for each theme and arranged them on posters.



Figure 1. Photo on the left: A card of a user’s hallway. The user is quoted: “...so for two months, I am supposed to give this back to someone. And I should give the other bag with clothes to someone. But I am still in doubt about that...” Below the theme is mentioned: taking action to carry out VR. Photo on the right: Example of a theme poster, which was shown to the designers in the second workshop.

We gathered visible visual reminders in people’s homes as evidence but we could not always verify to what extent people had actually used the visual reminders. For instance, if people claimed to write reminders on their hands we did not ask users to show their hands to confirm the information.

2.2 Outline workshops

We (three designer researchers) invited three designers (A, B and C) to work with us on a design task in two ongoing workshops (De Jong and Boess, 2007), see Table 1. The user data was not revealed to the designers until the second workshop.

Table 1: Roles of designer researchers and designers in two workshops

1 st workshop		3 days break	2 nd workshop	
3 designer researchers	3 designers		3 designer researchers	3 designers
presenting designs made with user data in mind	presenting designs made prior to workshop		providing user data, not designing	designing with user data in mind

The designers themselves were at that time doing research at the university, but they were unfamiliar with our research. Prior to the first workshop the designers, and ourselves, got the assignment to sketch two or more ideas for visual reminders at home.

In the first workshop we discussed and ranked these first ideas and then each of the designers to the workshop selected one idea to continue in the next workshop. We joined in the idea generation but revealed nothing to the designers about the user data.

At the beginning of the second workshop (Figure 2), we presented the user data to the three designers. The designers were given time to look at the cards and to read the quotes. After a few minutes, they were also told that they could ask questions about the user data to the researchers. Then the designers were asked to pick out the data of one or more of the users. Small design teams of a designer and a researcher, who acted as spokesperson for the users were formed. We took turns in the design teams to be available to each designer for information and exchange. Meanwhile, several copies of each card on stacks were available for designers to take with them during the designing. In the final part of the second workshop, the designers presented drawings or models of their design to the group.



Figure 2: Video stills from the second workshop: presentations of the final designs.

At the end of the second workshop we carried out an evaluation of both workshops to understand how the designers thought of the design process, without a structured agenda or list of questions.

We videotaped and transcribed both workshops, except from the designing part in the second workshop.

3 Designing with user data

3.1 Making a connection between the data and the designer's ideas

Two designers chose data to work with that they felt could contribute to their ideas. One designer (A) talked about cards of users working with lists to explain his choice for an idea. He stated that “people cannot always take the physical artifact with them, so making lists is their alternative, albeit undesired”. Designer C referred in this respect to a user who writes things to remember on large envelopes. She also stated about the cards that “it does provide me with more information...”and combined a card with her first idea.

The third designer (B) could not make use of the user data. He stated that what he saw on the cards reflects ‘little things’ people have to do, like mailing a letter or so, but he felt that, for instance, doing taxes seems to be of “a different” order. According to him, his first idea does not seem to fit into the situations on the cards, so he decided to choose another idea but referred to the cards when explaining the idea. This idea is “something that is inside the house, not in a specific place as is usual on the cards, but that can be used at more places in the house.”

3.2 *Applying user data to their design*

When working out their ideas in the second workshop, the designers tried to include the users. In the presentations they referred to specific situations on the cards.

Designer (C) presented her idea in a scenario of a mother with three children, based on a card of a user's hallway (see also Figure 1). She mentioned the problem of bags that were thrown down in the participant's hallway and she also imagined how her idea would fit in a household with several persons and children. She also used it to sketch the background for a prototype and actually altered the design to fit in the specific hallway. Designer (B) mentioned in his final presentation a user situation showing piles of paper in the kitchen and also people's behaviour "some people are more organized than others, some put papers in a cupboard and others make a mess of it.

However, designer A explained that he had to exclude people with families for which his design is not suited according to him. In the evaluation after the second workshop he said that it is important to make choices as "You cannot integrate all information in one idea". So you have to choose and then it becomes clear which cards are relevant for you and which are not. Here, the designer indicated specific situations that could be included in the design, but also other specific situations that were excluded.

4 **Presentation format of user data**

The designers found the cards helpful to assist them in their designing. At first, when confronted with the user data, the definition of visual reminders was discussed within the group ("what makes it visual and what should not be regarded as visual reminders?). They distinguished some issues, which were important for their designing:

- *adding a use context on the cards:*

Designer B seemed to notice a shortage of background information, at least for him, when he mentions that "I can see what they do, but I don't know why". And further "the cards reflect what people do now, but not how they want things to be". In the evaluation designer B mentioned that he could not grasp the full picture of a person. He suggested that it might be better to present user data in personal profiles.

The designers stressed the importance of context information on the cards in order to check their interpretations, such as cupboards being neatly cleaned or crowded with stuff, and that they do not need more personalia information, such as people's faces. Therefore, users should be asked to what extent they had altered things for the interview (as we had done in the research).

- *to what extent designers can empathize with the user data:*

Designer C mentioned that the examples are close to her own experiences, so in that sense the information was not 'new' to her but more an expansion to her own set of data on this topic. That way, she could make use of the data to alter her initial idea. Designer A suggested that for him to trust the data, it should consist of things that he is familiar with and also new things that differ from his own experiences.

- *at what point in the design process designers receive the user data:*
 Designer C indicated in the evaluation that she prefers to start designing ideas based on her own experience as opposite to the user data of families which are different from her own and said “if we would have taken the user data as point of departure, I would never have come up with this idea because it is a one-person household idea...”. Designer A suggested that he would even prefer to receive the data later: he might use it, for instance, for detailing a final idea, and also to cut away unnecessary features.

The more theoretical categorization of the user data in themes did not help the designers in their work. The short time that was available to take a close look at the data only provided them with the opportunity to read the individual cards, but they did not grasp the meaning of the themes. Making themes are considered to be an important step in the process, according to designer B, which he feels is necessary to do himself for gaining a deeper understanding. He suggested that it might be better to let designers work themselves with the unstructured data of users and make themes during the workshop.

5 Conclusion

- *how designers work with user data*
 Designers took the cards with them during designing and found that the cards helped them to empathize with users. They chose one or two specific situations of a user that they could relate to from their own experience and worked with those. Two designers indicated that they sought user data that could expand their designs rather than using it as inspiration for new ideas.
 Also, the user data enabled them to indicate which situations as shown in the user data were included in their designs and which situations were excluded from it.
- *how appropriate is the presentation format of the data to designers*
 The designers appreciated that the context of VR's is explained in photos and quotes on the cards. However, additional information, for instance underlying reasons of users for their use of VR's was missing. Although designer C mentioned that she appreciated the large amount of photos and the condensed textual information (only one quote per card), designer B thought that he needed more information to grasp the whole picture. Another issue is that although users in some cases told us how they would like to use VR's in the future, we could not include all these ideas of users in the cards. We felt that cards only showed visible reminders as artefacts, not people actually doing something with the VR in interaction. A video clip may be needed to clarify such interaction.
 The categorization of the data in themes was not helpful for designing. It was suggested that it is important that designers are made more aware of this process of categorizing to grasp the meaning and, possibly, usefulness of the themes, in a way that supports their designing.

6 Discussion

A wealth of literature on participatory design and ways for designers how to integrate people's knowledge and ideas in design processes is available, such as exploratory design games to organise participation and the use of personas in product design to engage designers (e.g. Brandt, 2006, Grudin and Pruitt, on internet). Our research sought to identify ways how a small design team of researchers and designers can communicate about the various requirements, expectations and benefits from users. However, within (larger) design teams such communication may be even more critical for the inclusion of user data.

In a paper presentation session followed by a semi-structured discussion, which was held as part of the IEA congress 2006, we invited experts on inclusive design or participatory design who use a diverse set of approaches to discuss communication of user data within larger design teams, for instance including company management. One of the outcomes of the session was that the various parties in the process may ask for different presentation formats of user data and that the explicitness of data and findings may vary. For instance in one approach, it was the quotes and visuals that brought the data alive with the design team, but meanwhile graphs and tables with findings were considered to be important by the company who assigned the team. However, a shared design vision can form a bridge between parties. Visualized user data could become part of information materials for design researchers and process managers.

A next step in our research would be to study how user data could be used in larger design teams and to seek for appropriate presentation formats of the data.

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