

Constructive and Action Tools for Creating Prototypes

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ABSTRACT

We aim at utilizing the constructive and action research techniques for contributing the existing User centered design approaches. Putty clay was used as a constructive research tool and Probe as an action research mechanism for adding value to existing UCD practices. A total of 10 people participated in the research. Both these tools can bring user-driven contextual insights unlike traditional user centered-design. They have the potential of contributing the existing user centered design processes by providing innovative insights in the users through the means of their expression and communication itself.

Keywords

Human Computer Interaction, User Centered Design

INTRODUCTION

Last decade has witnessed considerable growth in user research methodologies. Majority of user research methodologies are based on ethnographic techniques such as interview, focus group discussions and contextual observations. All these different ethnographic methodologies enable product designers to collect rich insights from the users. They also help in designing potential use cases based on the gathered user needs and expectations. Liz Sanders [3] stated that “*product design research is influenced by two opposing mindsets*”. First category is “*expert mindset*”, designers are considered as the experts and design is developed by them on the behalf of the users. Second category is “*participatory mindset*” where “*designers are co-creators*” and users are true experts. User centered design (UCD) is expert minded while constructive research tools possess participatory mindset.

UCD involves expert mindedness in collecting, analyzing and interpreting data for supporting product development [3]. On the other hand, constructive research tools involve users actively so that the designed product serves the needs and expectations of the users. Constructive research tools are also defined as an approach that involves “*creation of shared design language*” that can be used by both researchers and designers to communicate with each other [4]. The design language is constructive as it enables the users to express unlimited number of ideas through a limited set

of stimulus objects [4]. Constructive research tools help in getting genuine insights as they capture psychological state of mind of the users. Moreover, users are completely unaware of the process, of capturing their psychological mindset, going on behind this mechanism. One of the key characteristics of this type of participatory design is that it involves physical artifacts which are used as thinking tools throughout the process. In addition to the previously discussed mindsets, there exists a third mindset called as action design [1]. It differs from UCD in some respects such that it does not focus on the utility and usability like UCD. It evaluates the design from the perspective of “*How things stand for the user*”. Designer creates probes which provokes understanding of the users on the current values. The probes are fuzzy stimulus send by designer to the users in order to get insights on the design process. It is a tool for designer to get inspiration rather than for understanding the experiences of the users with a particular product or service [1].

In rest of the paper, first the research questions and the overall study is summarized. The study explains the details about the usage and significance of Putty Clay and Cultural Probe in the research. The paper concludes with the discussion on both the tools.

RESEARCH QUESTIONS

The main focus of the research was to look into new ways of capturing user needs and expectations. There is a need for finding new methods for gaining insight into the genuine user expectations, behaviour, and motivation. The research questions for our theme were:

- How constructive and action research techniques can be introduced for contributing the exiting UCD practices?
- What kind of results can be gathered by using Putty Clay and Cultural Probe in the user study?

THE STUDY

The context of the research was “*developing a technological solution for people living in communes*”. The research was performed through user centered concept development process [3]. The conducted research involved different phases – namely commitment, technology and user research, innovation sprint, concept creation and visualization, concept

validation and assessment (See Figure 1). All the different phases contributed in finding answers to the research questions.

The research was supported by practicing putty clay and probes in a real study setup. We used putty clay as a constructive research tool and Probe as an action research mechanism for adding value to UCD practices. Both of these methods engage users and infer user-driven contextual insights. Putty clay and probes were used during the user and technology research phase. The insights provided by these methods are far more powerful and useful as compared to traditional UCD. The findings provided by usage of both these methods contributed strongly in coming up with the final concept.

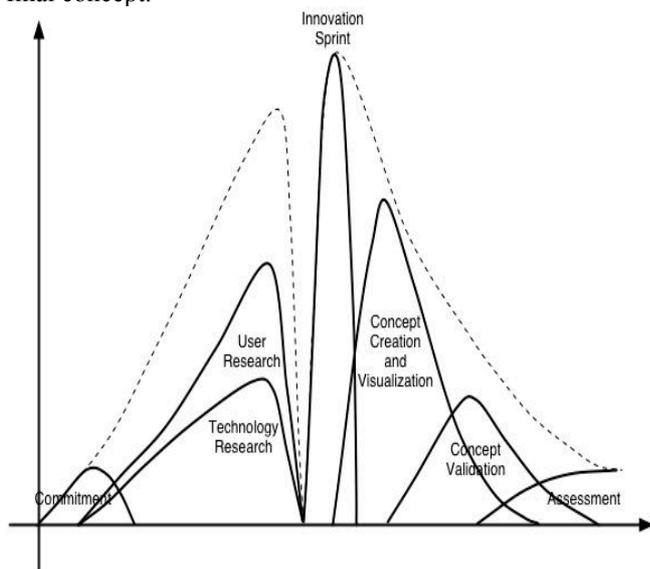


Figure 1: Phases of the user-centered concept development process [3]

Putty Clay

We used molding putty clay as a constructive tool during focus group and individual user-interviews during the user research phase. Test participants were given molded clay called putty while conducting focus group sessions and individual user interviews. Putty clay was a little extraordinary, (it melts, stretches, one can bounce it) so it got the participants even more excited than a normal clay. It proved to be a tool not only for gathering data but also for easing the tension of the interview situation.

Test participants were more relaxed and excited when they were allowed to do something with their hands at the same time while they were speaking/ thinking. The participants started making random structures while they were participating in the focus group discussion and individual user interviews. The random structures modeled by the participants provided deep insight into the psychological state of their mind. These structures contributed greatly in proposing the final concept. However, as stated earlier, the test participants themselves were unaware of the significance of the

random structures created by them. During the study, some interesting findings were made.

During one hour interview session, many such structures were created using the Putty clay. We thought of investigating the validity of the statements made by the test participants while they were modeling clay at the end of interview session. Test participants modeled clay into different structures depending upon the asked questions. For example, when the participants were asked, “*What are the main problems you face in your daily living*” then while answering this question, one of the test participants made electric knuckle-duster of the clay as shown in the Figure 2. We didn’t interrupt the interview session; however we asked the same test participant at the end (in private) about the structure by showing the picture (all the interview session was recorded). Test participant stated “*This is super solution of every day problem here; I simply hate my roommates when they are lazy to do house work. I can punish them with this electric knuckle-duster*” (Figure 3). Similarly, another participant made a bulletin board from the putty clay (Figure 2). When asked about this structure then participated stated, “*I think there is a need for improving communication so bulletin board is what we need here*”.



Figure 2: Electric knuckle-duster of the clay



Figure 3: Image of a molding representing a bulletin board.

The overall user research session, involving putty clay as one of the methods, revealed that almost all the test participants were reluctant of giving true opinions during the group interview. This shows that constructive tools are competent for getting the real user insights. However, we also found one drawback in this technique. Some of the clay structures were either meaningless or users found difficult to explain due to cognitive load reasons.

Cultural Probe

We used cultural probe methodology during the user research phase. The main motivation behind using cultural probes was to capture the actual emotions of the test participants related to their living together in communes. There were several supporting reasons behind using cultural probes- First; it suits our research context as other techniques such as observation were not applicable because people might not act in the same way as normally if observers are present. Second, collected data was spread over the time of one week so users did not felt as they were observed. Third, the positive, neutral and negative feedback about flat-mates and activities can be given anonymously. Finally, the ideas are probably often documented soon after the occurrence of an event.

In order to capture real time user data, a one week long probe was followed. Our technique is different for dairy studies as users are not asked to write down their daily experiences on paper but they can express there mood using symbols. A box was created as shown in the Figure 4 having three slots with smiley faces representing the range of emotions from negative to positive, namely 😞, 😐 and 😊. Test participants can pick a token and put symbols depending upon their mood. The instructions for the use were described on the boxes. Post-its and a pen were attached tightly to the box so that tenants do not skip the writing.

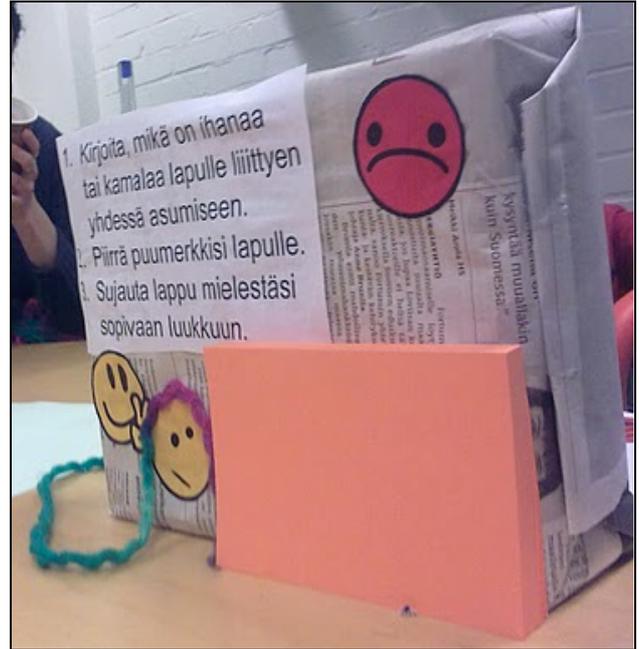


Figure 4: Box created for Probe

We found one drawback of this technique that only limited information can be gained from the users as they express their opinion in form of their mood. Evaluating feelings and emotions can be difficult but we solved this problem by asking our participants to mention the target object with the mood. For example, test participants made entries like “bathroom😊”, and “kitchen plates😊” The technique of cultural probe turned out to be quite successful as we received about 70 notes from 1 week long probe in a 4 person commune (Figure 5). This outcome of the cultural probes provided two main insights namely – 1.) Users participate happily in this kind of study as it is new and innovative. 2) It requires less effort from the participants unlike other methods aimed at gathering real time data such as dairy studies. 3) Users can anonymously submit their responses. 4) It enables users to express their emotions in form of smiley and other symbols.



Figure 5: View of Opened Box created for Probe

DISCUSSION

Putty clay and cultural probes played significant role in designing the final concept, satisfying the needs of the users living in communes and dormitories. The final concept created as a result of whole research constituting putty clay and cultural probes was "Commune Whiteboard". Commune whiteboard (CB) is a daily utility aimed at improving communication, easy sharing and distribution of tasks, providing joyful living experience and motivation for doing house tasks and using this solution. The outcome is encouraging and user insights gained from these methods were used in product development. The idea of designing commune whiteboard was motivated by the bulletin board structure made by the one of the test participant using putty clay. We believe that both these creative design research approaches can further contribute to the existing UCD by providing new and unexpected insight. For future, we plan to extend this study in three ways. First, develop and test new constructive and action research techniques. Second, repeat this study in different study setting having more number of participants. Lastly, finding new ways for incorporating users' creativity in the design process.

PROJECT PARTICIPANTS

Mikael lavi, Eetu Kupianen, Ida kivela and Joonas Jaatinen contributed and participated along with

Amandeep Dhir in different phases of UCD. The paper is created from the work carried and submitted as a group-work in *T-121.5350 course on Strategic User Centered Design* at Aalto University, Finland

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