

A User Centered Concept Design for Enhancing Living Experience

Department of
ComputerScience and
Engineering, Aalto University,
Finland

Amandeep Dhir, Zhonghong
Ou

firstname.lastname@aalto.fi

ABSTRACT

We aim at making life easier for people living in communes through touch based technological solution. A user centered-design methodology was followed with 10 participants. The result suggests that our design can improve the social life of the tenants living in communes. Furthermore, the research makes a contribution for the product designers who are targeting at specific user groups such as ours. In short, we have a technological solution having playfulness, an element of motivation, flexibility and above all a problem solving element for making life easier, better and joyful.

Keywords

User centered-design, social experience, communes

INTRODUCTION

Commune whiteboard (CB) is a daily utility to perform and keep track of the household tasks in a motivating way. It has several benefits - namely improving communication, easy sharing along with distribution of tasks, providing joyful living experience and motivation for doing household tasks and using this solution. Furthermore, CB can be customized for different needs and is accessible from anywhere. In this paper, we first present research questions behind this study and research methodology describing its different phases. Then, we describe the outcome of this study in form of Commune *Whiteboard* and finally, discussions on the results and future work are presented.

RESEARCH QUESTIONS

The main focus of the research was to look into the everyday activities of the people living in communes - namely their lifestyle in commune, problems faced by them while living in commune, reasons for making a choice to live in commune and benefits of living together. The research questions were based on user research and technology research. The research questions for our theme were:

- What are the challenges faced by the people living in communes?
- What are the reasons for moving into communes?

- How can we enhance their experience of living together in communes using technology?

RESEARCH METHODOLOGY

The research was performed through user centered concept development process [1]. 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.

Commitment Phase

During the commitment phase, design brief consisting of mission statement, technology framework, context and user group were defined. Considering the time constraints, communes and tenants were set as the target user group and context.

User Group

The user group consists of persons living in a communes or dormitories. People having 18-35 years of age and possess basic knowledge in using computers but the target group do not contain IT-professionals. In a commune or a dormitory the tenants share at least one room, some tasks and some common goods.

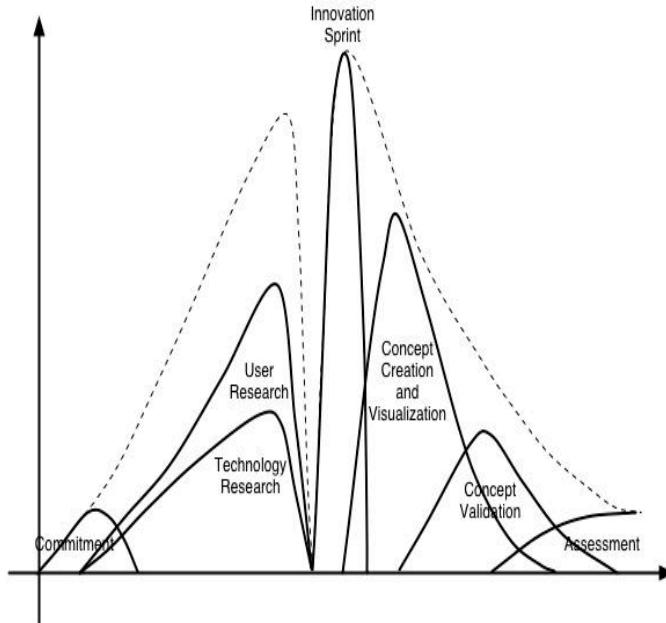


Figure 1: Phases of the user-centered concept development process [1]

Design Brief

It was also agreed that final product should cover four aspects of technology framework in the design brief. The technology framework aspects are defined below:

- *Business* - The product should have a business value for a company that is going to invest in the product development. The product must be unique so as to give a market niche to it.
- *Social* - The social and cultural issues need to be analyzed as they affect the customer acceptance criteria.

- *Philosophical* - There can be philosophical factors that may affect reputation of product. For example, privacy of the user information is a critical issue for any service. Philosophical angle enables us to deal with such factors during the product designing phase.
- *Technical* - The outcomes of the product largely depend on the type of technology used. The technology used for designing the product can both strengthen and weaken the users' point of view towards the product. We choose design theme having touch and gesture based user interface.

Mission Statement

We agreed on a common mission statement for developing this product as it was essential for clarifying the goals of our final concept. The mission statement was: “*We want to make life easier, safer and more efficient for our users by providing them intelligent aids for everyday life.*”

User Research

In next phase, the research goals and methods for user research and analysis of the data were selected. We conducted the user research by using four different methods - such as focus group [3], individual interview, diary-like probe and observation by context [4]. In addition, we used putty clay to gather additional insights about the participants' behaviour and study settings. The gathered data was analysed using Affinity Diagram [4]. The process of user research consisted of two focus group interviews, eight individual interviews, and two sessions of both observations by context and probing. We identified ten recurring themes from the affinity diagrams (Figure 2).

Design Perspectives

After the user research and analysis, we decided five design perspectives [2] for solving the problems faced by the users.

- **Motivation-** It was found from the user research that tasks are assigned but are not always done by the people responsible for it. Therefore, it is important to come up with new ways to motivate people to do their tasks.
- **Distribution of Tasks** - Task sharing was found to be very challenging in communes. People often do not discuss or agree on task sharing due to several reasons. It is important to understand reasons which restrict them in discussing and agreeing.
- **Communication Channel** - Users have difficulty finding a common communication channel. Users have different skill sets and they tend to have different preferences for communication channels. Some prefer IRC or Facebook while others would prefer face-to-face discussions and sticky notes.
- **Sharing of Information** - People prefer sharing of information regarding the general commune happenings. When such information is not shared among the tenants then it creates a sense of

isolation for those who are not aware of such happenings.

- Social living Experience - It is important to enhance the social living experience and make it joyful.

Results from affinity diagram

We identified ten main themes describing needs, expectations, motivations and activities of the people living in communes through the means of affinity diagram (See Figure 2). It was found the tenants considered social and housing benefits as reasons for living in communes. Tenants use communication tools and other services. Furthermore, tenants consider social and organizational challenges as barriers in their daily life inside communes. Affinity diagrams have clearly highlighted the need to solve these challenges faced by tenants.

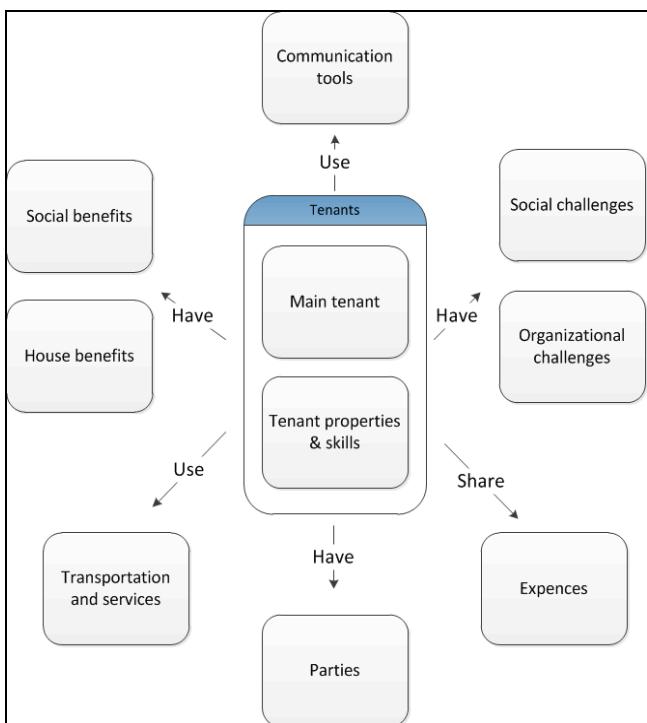


Figure 2: Results from affinity diagramming

Innovation Spirit

The aim of innovation sprint phase is to generate large number of product ideas. “*Ideas can vary in detail, having different level of maturity, originality and significance for the product designers*” [1]. These ideas are generated by keeping in mind the whole development process involving users, technology and context of use. There are different idea generation methods [5], but we used Brainwriting which is also known as the 6-3-5 method [6]. Brainwriting produces a lot of ideas in quite a short time. Each member writes down three new ideas in five minutes and this process is repeated until –all the participants got their own original papers back. After the ideas have been written down, the same papers get passed around the table and each participant gets to mark three different ideas as good. When everyone has read the ideas and selected their

favourites, we digitized the ideas to a spreadsheet with the numbers on them. A total of 150 ideas were generated based on the data gathered during the user and technology phase of the research.

Concept Creation and Visualization

Conceptualization was performed to create concepts from the generated ideas during the of innovation sprint phase. After the concept creation phase, it was decided to visualize these concepts using different methods such as stories, storyboard, scenarios, paper prototypes and mock-ups. All the visualizations were in Finnish except the paper prototype of mobile UI and Touch Wall. After visualizing the concepts a pilot testing was done for each of them with different users who did not know anything about the project. The aim was to figure out if these visualizations were understandable before proceeding with them further for final validation testing. Based on the feedback the visualizations were improved before heading to the validation. From sixteen visualized concepts, eight were finally validated with the focus groups.

Concept Validation

Before the actual validation, all visualized concepts were reviewed and a validation plan was created. It was decided for having a common framework for arranging different concepts. All concepts were modeled in one single product called “Commune Whiteboard” (CB). This arrangement was essential because a more tangible product was required for having focus groups based validation. Furthermore, this helped test participants in identifying themselves as users of CB. In the validation, we presented a single solution in two focus groups for evaluating different aspects of CB. As a part of the validation session a questionnaire was handed to the participants to gather their immediate responses to the concepts. Participants were asked to rank all concepts in the scale of 1-5, one being the least wanted and five means best fitting. Validation was both qualitative and quantitative in nature as it involved quantitative questionnaire and qualitative feedback in terms of focus group interviews. Based on this feedback, improvements to the concepts were made. In Figure 3, results from the validation phase are presented. Participants were mostly positive about the presented concepts.

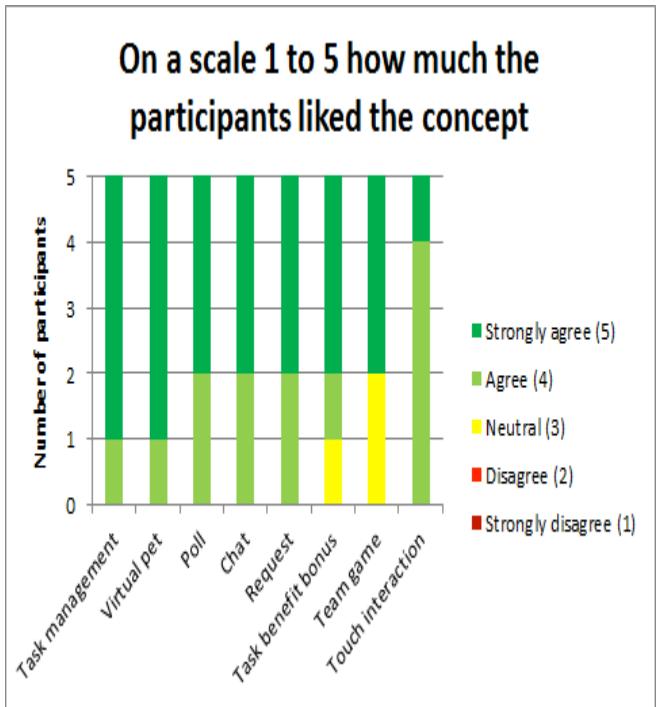


Figure 3: Validation Results

Concept Assessment and Findings

The concept assessment phase involves evaluating the validated concepts against the initial requirements. *CB* is a highly flexible and customizable solution that allows commune tenants to keep track of their household tasks in a motivating way. The system is accessible through touch and gesture based interface attached on the wall. The system can also be accessed through desktop machines and mobile phone as a web service since portability was one requirement. Also, some features which motivate users to use the system and do their tasks as well as interact with each other were added. We found users were quite content with their daily lives and their way of living. However, in some areas they would wish to improve and one such area is communication and information retrieval. They lack a proper communication channel for their affairs in the commune: rules, tasks and basic information about the housing. They would like to see a solution that can solve these problems, makes daily routine more social and enjoyable.

COMMUNE WHITEBOARD (CB)

CB is a solution for every commune as it makes living in a commune fun while keeping daily tasks organized. An overview of *CB* is shown in Figure 4.

Task management

One of the largest issues in communes is sharing of tasks. *CB* solves the problem of sharing of tasks, it provides task creation and assigning automatically based on the initial setup and user preferences. Tenants can easily see tasks already completed through history view and present tasks they are doing and their future tasks. To increase the social experience, the system

embraces co-operation which means tenants can do cleaning tasks together to earn more points.

Motivation

CB includes social games for motivation. This helps in transforming their present experience of doing household chores into a social experience full of fun and joy. Every tenant creates their own character, buy a better gear for the character by doing household tasks and then battle against other tenant's character as shown in the Figure 5. By doing efficient, neat and clean work, a tenant can earn weapons for the characters.



Figure 4: Commune Whiteboard

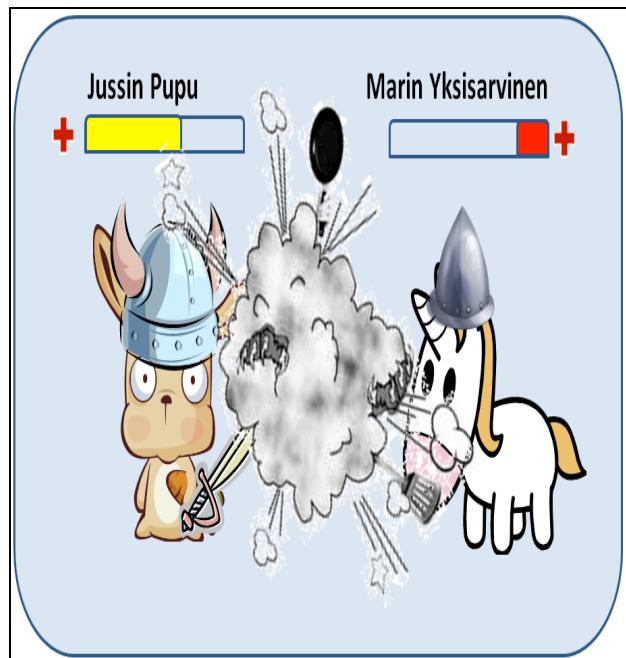


Figure 5: Characters of the social game

Chat

Users were looking for a solution which is usable, motivating, cheap, intuitive, portable, immediate and reachable. It supports a chat which combines different chats like Facebook and IRC (internet relay chat).

Polling

In order to create consensus on the urgent matters that requires quick notice, this feature is provided.

Customization

Considering the fact that communes can be different at different places we provided customization options so that CB is suited to everyone.

Accessibility

It is accessible from commune wall, desktop machines and mobile phones (See Figure 6). Whether you are having breakfast in the kitchen, doing homework in your room or waiting for a bus the CB will always be accessible. A large touch screen may be placed to a central place in the commune from where any of the tenants can access it. Web interface enables you to check any information from your own computer. Additionally you may access it from your mobile phone.

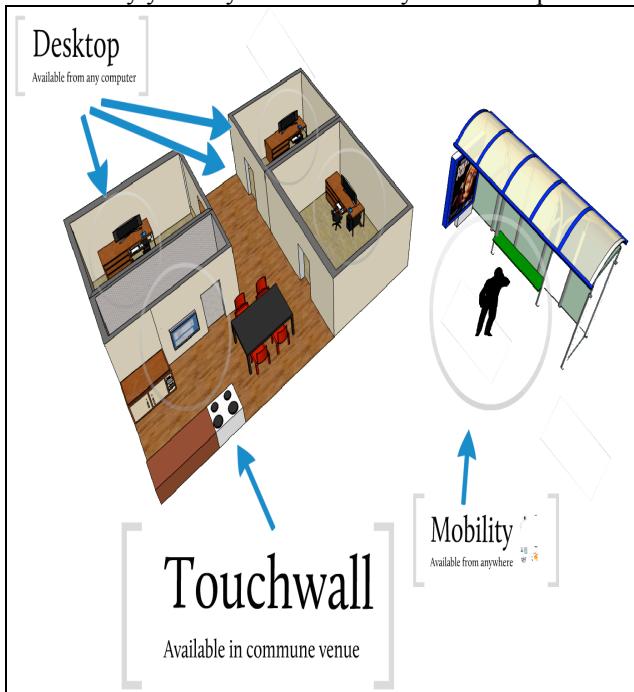


Figure 6: Accessibility of the Commune Whiteboard

DISCUSSION

In this paper we present our first design of a technology based solution for communes based on seven weeks UCD. The outcome is encouraging, since the final prototype design was fully accepted by the test participants. In the future, we have two directions to

extend this solution. First, validate this design in other countries apart from Finland. This will enable us in possible generalisation of the findings. Second, we plan to use other qualitative and quantitative methods in order to extend this study.

PROJECT PARTICIPANTS

Mikael Iavi, 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 in *T-121.5350 course on Strategic User Centered Design* at Aalto University, Finland.

ACKNOWLEDGMENTS

We thank all the test participants for insightful comments during the study. Additionally thanks to Mika P. Nieminen and Thomas Olsson for their comments on the paper. The work has been supported by Department of Computer Science and Engineering, School of Science, Aalto University, Finland.

REFERENCES

1. Nieminen, M., Mannonen, P., Turkki, L. (2004): User-centered concept development process for emerging technologies. In: 3rd Nordic Conference on Human-Computer Interaction, pp. 225–228. ACM Press, New York
2. Mannonen, P. & Nieminen, M.P. (2007). Design perspectives: sampling user research for concept development. In *Proceedings of the 7th international conference on Engineering psychology and cognitive ergonomics (EPCE'07)*, Don Springer-Verlag, Berlin, Heidelberg, 108-117.
3. Kitzinger, J. 1994. The methodology of focus groups: the importance of interaction between research participants. *Sociology of Health & Illness*, ISSN 0141-9889, Vol 16, No 1, pp. 103-121.
4. Beyer, H., and Holtzenblatt, K. Contextual Design: Defining Customer-Centered Systems, Morgan Kaufmann Publishers, Inc., San Francisco, 1998
5. Osborn, A.F.; 1963; *Applied imagination: Principles and procedures of creative problem solving* (Third Revised Edition). New York, NY: Charles Scribner's Son.
6. Rohrbach, Bernd; 1.10.1969; *Kreativ nach Regeln – Methode 635*, eine neue Technik zum Lösen von Problemen. *Creative by rules - Method 635, a new technique for solving problems*; First published in the German sales magazine "Absatzwirtschaft", Volume 12, 1969. p73-75 and Volume 19.