Motivation in Lifestyle Changes

Using Mock-ups as a Tool for Exploring the Design Space

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Abstract—**The sedentary lifestyle is a growing problem in many western countries. Obesity and resulting health related problems are more and more common. Indeed, designing tools to help people take action against obesity, and moreover to stay motivated for both making and maintaining a lifestyle change could prove important for our society. The Participatory Design approach has extensively been used when designing new technology. It is less investigated if it is the most useful method in designing for a larger, heterogeneous, and non-consistent group of people. In this paper, I suggest to use the framework of Lim et al. "The Anatomy of Prototypes".**

Keywords; motivation; lifestyle changes; fun; Mock-ups; games

I. INTRODUCTION

In western societies the number of lifestyle related health problem is growing. More and more people gets hospitalised, gets incapacitated by alcohol consumption, smoking and obesity. This trend puts a focus on our lifestyle and our ability to manage, and control, the endless offers that our affluent society provides. To answer to this emergent need for lifestyle changes, the Health Barometer project was initialised. The Health Barometer project aims to design a mobile application, targeting bad alcohol, smoking, and eating habits, and aims to help users stay motivated during this change of habit.

This paper describes four different mock-ups and workshops that through various perspectives collect inputs about motivation of users. The findings of these tests will be discussed in the end of the paper and will lead to some suggestions about how to motivate users during a lifestyle change.

This paper presents reflections on experiences using mock-ups in the on-going project that aims to provide a mobile tool to support lifestyle changes. The methods and approach of participatory design (PD) are challenged by the potential large and heterogeneous group of future users, as the PD methods often are used in a well-defined, bounded setting. The PD tradition of iterative prototype refining has proven records [3], [4], [5] in developing new appliances in a well-defined setting. The Health Barometer differs by facing a larger group of users and hence a different design approach is necessary.

II. METHOD

The exploration of the design space is based on the framework of Lim et al. "The Anatomy of Prototypes" thus using mock-ups not only for refinement but for investigating the design space and thereby creating domain knowledge. This means that the mock-ups used in this particular design process has purposefully been formed as manifestations of design ideas. The PD approach often utilizes various prototyping techniques in order to create a better understanding of users needs and for exploring design ideas. This could include game based design and role-playing approaches [6] as in the case of the Health Barometer project. In PD the designer creates a design space, for example through tangible objects, that lets the users be creative and active, thus helping to create and explore design ideas. Because the users are not designers, the results from such workshops in the PD-regi needs to be reinterpreted in order to better understand the users needs and values, rather than adapting their design ideas directly into the final design [1]. This is also the case in the Health Barometer project, where each mock-up and workshop is a product of the design teams reinterpretation of the previous design activity combined with a careful chosen filter in a purposeful manifestation.

III. WORKSHOPS AND MOCK-UPS

The investigation of the design space was conducted (so far) in four different workshops, with four very different filters on the design space. The filters were: fun & games, users & technology issues, frames for free exercise games in public space and lastly putting all the positive feedbacks in one mobile application. The investigation consisted of first a prototype of a mobile game, then a post card and inspiration card workshop [7], a body storm [6] with various props, and finally a prototype for a mobile application for logging data.

A. mobile game

To follow the Lim et al.'s framework the first mock-up was created with a specific filter. This filter consisted of a twofold design goal: 1) it should be possible to play your way to a life style change, and 2) it is difficult to see the result of a lifestyle change, as the wins are often not visible, like for instance a decrease in various cancer risks (this often came up while interviewing people who where in the initiative process of great weight losses). This design goal was created on the basis of

interview with obese people during weight loss, research of edutainment, exergaming and on the HCI book Funology written by M. Blythe et al. [8]. The design idea was manifested in a cardboard prototype with screenshots of how the game would be played (see figure 1). A user group was invited to play the game and have a discussion about pros and cons of the game in relation to make a personal lifestyle change. As the game was intended as a process starter the users were all at the state of beginning a lifestyle change.
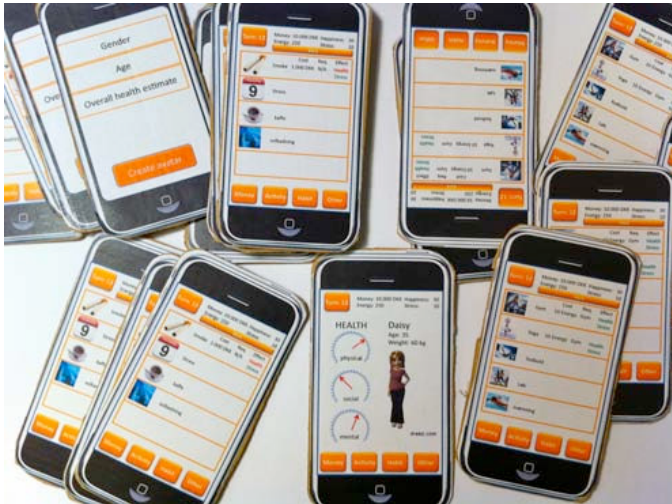

Figure 1. Cardboard mock-up of mobile game

The basic gameplay was based on existing mobile games that through turns let you make decisions that in this game would be calculated to expected lifespan. In each turn the user could buy and do stuff e.g. holidays, cigarettes, food, activities, and parties. The gameplay aimed to simulate the life of the user as they choose to live it, thus calculating the expected lifespan. There were no limits of how the users lived their life in the game, and so they were free to live as healthy or as unhealthy, realistic or unrealistic, as they wanted. The game was designed to evoke the curiosity of the user to investigate various lifestyles, and therefore the time of a completed game was about 10 minutes. After testing the game a couple of times, the users evaluated positive and negative features of the game. The evaluation is listed in table 1 below.

TABLE I.   EVALUATION OF MOBILE GAME

Positive	Negative
Made goals and future benefits visible	Not giving tools for action
Easy to use	Hard to relate to self
Users found it nice that it was a game, and therefore it lowered the bar for participating	The translation to real life was too hard
Bringing focus and awareness to the lifestyle change	If users were completely honest in first attempt they failed to use the application to explore the "what if" situation
Fun	Could feel like a waste of time

The test of the mobile game gave valuable input of both what the users need in a motivating mobile appliance, and it clarified how abstract it felt for them, just to have a game, to learn new real-life skills from. It also gave us input in how determined the users were to do what they thought we wanted them to do, since all the users where quite true to their own lives in the game.

B. Inspiration Card workshop

An inspiration card workshop consists of technology cards and domain cards [7]. The idea is that users will pare domain cards with technology cards, and thereby creating new suggestions for design concepts. By forcing the users to solve issues from their domain by combining the domain-and technology cards we provoke the users to reflect on their own situation. In that way the design suggestions can tell the designer about the users' needs for a future system. These suggestions also give the designer an opportunity to explore both the dreams and the everyday life of the users.

Figure 2. Users engaged in creating suggestions for design concepts

As a prelude to the inspiration card workshop each user started filling out 4 postcards, concerning their own issues and successes with a healthy lifestyle, tips and tricks that the user would pass on, about maintaining a healthy lifestyle, and finally pointing out when the healthy lifestyle was easy to maintain. The postcards that the users returned had two main purposes: giving input to domain cards and to engage them in workshop 3 days later.

In the actual workshop the users were invited to come up with new concept ideas for a future Health Barometer by combining technology cards with both domain cards and experience cards (see figure 2). Experience cards were a type of cards that were created to this specific workshop. The experience cards consisted of feelings, experiences, wishes, and motivations. Examples of experience cards could be: rewards, pride, including family –especially kids, the outdoors and so on. We found the need of an extra category when

reading the returned postcards. The suggestions for design concepts provided an insight in users dreams and needs. It can prove valuable to find ways to let the users express their dreams. Often users are more honest when speaking about their dreams compared to what they'd say if we had put an almost finished prototype to the test. Often users respond positive to a prototype simply because they want to please, and thereby blurring the relevance of the system. In our findings user suggestions for design concepts helps define system goals by focusing on issues related to how to get the job done, rather than focusing on technical and for instance economic issues. The inspiration card workshop makes it possible for the users to take an active part in distributing their knowledge, thereby helping the "right" problems to be solved by the design team. By reviewing the design concepts we gathered information about their time schedules, their motivation, and their dreams for technology, and in what way the users would like a future Health Barometer to work. The wide spread of design concepts that was produced that day, together with the knowledge from the previous mobile game test showed another important detail, namely that the system also could be too specific to one situation. The users in this test specified that what they needed in the beginning of a lifestyle change not necessarily was the same a month later, and again might be completely different four months later. And yet they still wanted to use the same system all the way, so none of their progress or data collected would be missing. This also suggests that the use of different prototypes and mock-ups is preferable to detect otherwise hidden knowledge that the refinement process of ne prototype might not detect.

B. Full-scale exercise game

The third mock-up produced was a full-scale exercise game. Framing the mock-up in the definition of Lim et al. the filter of the game was (again) twofold: 1) to see how far users could go in bodily expressions –both regarding to self and to the surroundings and 2) how creative users could be in inventing new exercises for other users. In this way the game was designed to provoke both reflections and actions by using full-scale exercises to investigate the limits of exercising and social interaction in public (see figure 3). The game was created outside in a park, with no limits as to type of exercise, but with use of the 5 basic game mechanics [9]: Collection, Points, Leaderboards, Levels and Feedback (see figure 4).

The game was based on concept suggestions from the previous inspiration card workshop and was transformed by the design team into an open-ended gameplay. The game allowed the users to gain exercise points by doing an endless variety of exercises; the limit here was only the users imagination. The game unfolded the physical need for such a game to work. The users became very self-aware in doing the exercises in public space, and there for the game, or system, had to include a number of physical and highly visible installations where the user could register their exercise. These installations created a space where the actions of the users became legalized –in the same way that a football field marks the space where it is okay for 22 grown up men to run after a small leather ball.

Figure 3. Users demonstrating exercises to strangers in the full-scale exercise game

After the game was tested for 2 hours, the users evaluated positive and negative features about the game. They are listed in the table below.

TABLE II.   EVALUATION OF EXERCISE GAME

Positive	Negative
Fun	Expensive new physical installations in parks
Made workouts feel like a game	Required a lot of space
Motivating forward due to use the game mechanics	A need for a definition of space/room
Social interaction through technology	Hard to be the first user
Flexible in time	
Fitting perfectly into everyday life of the users	
A feeling of flow-state	
The users felt empowered in creating the content of the game	
It was a motivation factor that the game facilitated relations among users	

This full-scale game enlightened new angle of the needs of a future appliance that would support and motivate users to be active and to continue a lifestyle change. The game showed how game mechanics could be used in creative ways to motivate forward, so that the user would be more at ease the next time, the user had to lace up the running shoes. The endless possibilities of scaling exercises were very appealing to the users, and not a single user felt like they couldn't manage the task, which they interpreted as a flow-state [10], thus giving them inner motivation to proceed. By acting out the game, we got a thorough insight how much the empowerment of the users really means to their motivation of playing the game and in the future using such an appliance.

Figure 4. The basic game mechanics used in the full-scale exercise game

C. Food and exercise log on a mobile

The so far last mock-up created, was a mobile application. The filter or the design goal of this application including several needs found in previous prototypes, interviews and workshops while at the same time keeping it very basic, and without gaming elements. By leaving out the gaming element the design team tried to investigate how important a fun-, play-or game element is to the users in the final design concept. As this food and exercise log was only recently created, it still requires further testing and evaluation. So far only four people have tried it in its paper mock-up version. The evaluations are as follows in table III.

TABLE III. EVALUATION OF FOOD AND EXERCISE LOG ON A MOBILE

Positive	Negative
Made goals and future benefits visible	Not giving tools for action
Easy to use	Hard to relate to self
Users found it nice that it was a game, and therefore it lowered the bar for participating	The translation to real life was too hard
Bringing focus and awareness to the lifestyle change	If users were completely honest in first attempt they failed to use the application to explore the "what if" situation
Fun	Could feel like a waste of time

The test of the food and exercise log gave us input about a different motivation. Here the users said that the application to some degree was addictive to use, simply out of curiosity. They wanted to know how many calories their daily intake represented. After a while the use began to be motivated by bad conscience, thereby representing an external motivation. So in use and by the leaning progress of the users the motivation for use flipped from internal (curiosity) to external (bad conscience) and we then risk that eventually the users will stop using the application [11].

IV. DISCUSSION

The design process in the Health Barometer project used mock-ups and early stage prototypes, not for refinement of a specific design idea, but for investigating the design space. By doing so creating a better understanding what motivational factors to aim at in the final design. The broad spectre of the mock-ups gave us valuable input on how to motivate the users, and how to keep them in the motivated state of mind for a long time. Our findings showed us, that it was not enough to provide the users with a direct problem-targeting tool (for instance a calculator to calculate energy intake vs. outtake). In order to see great weight losses, we needed to find out how to keep the users motivation up, for a longer period of time. As we all know, weight loosing doesn't come over night, it takes time, and the person undergoing the weight loss will repeatedly have to make an active decision to keep up the healthy lifestyle. Lacing up those running shoes everyday, requires a great deal of constant motivation. Our design investigation showed us that games and fun might be the means to keep up the motivation. The findings of our investigation can be summarized as following reflections for the future Health Barometer.

1. Motivate in advance for next training session by using game mechanics such as points, leader boards and levels

2. Motivate in advance for next training session by providing a social platform

3. Motivate by empowering the users. Let them create the content

4. Motivate by combining relevant information and direct tools for real life

5. Make it personal

6. Make it fun to use

7. Design for stimulating both inner and outer motivation

These findings should be considered in the light of the testings' itself. It is obvious that different result is found if using different design techniques. We need to understand mock-ups as performative, meaning that mock-ups affect the users in both concrete, material, and bodily ways in situ [12]. This paper describes the use of 3 different design techniques: cardboard mock-ups, inspiration card workshop and body storm. In the bodily tests users tend to be rather enthusiastic and engaged in the tests [13], which of course affect their overall inputs. In the third test with the full-scale exercise game the users found it very important to include the game mechanics (1) in a final device. This shows that the game itself, the bodily engagement, trigged their competitive instincts, and by using game mechanics such as levels and handicaps everyone felt like a winner. Also in the full-scale exercise game "user empowerment towards content" became indispensable because the users suddenly were motivated by their own

creativity. A different type of test might not have showed these results. A sedentary think-test might not have triggered competitiveness simply because a sedentary test would not automatically trigger the sympathetic nervous system. Different motivation guidance was found in the sedentary user tests. Here the motivation findings included personalization (5) and information relevance (4). This points to the value of using diverse mock-ups both in accordance to filters and to manifestations to explore the design space, as done in the Health Barometer project.

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