Designing New Generation of Wellness Applications – Background Work

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Abstract
In this paper we summarize the work we have conducted for designing novel mobile applications to support long-term motivation towards wellness activities, such as increase of physical activity. The research process combines theoretical models and several rounds of field studies.

Keywords
Wellness, mobile applications, design research, cross-cultural study, user experience

ACM Classification Keywords
H.1.2 User/Machine Systems: Human factors. H.5.2 User Interfaces: Evaluation/methodology, User-centered design.

Introduction
Over the period of two years, we have conducted several different types of field studies to learn about the usage habits and user needs towards wellness applications in several cultures. By utilizing "design through research"-methodology [15] we aim at combining research models and theories with the knowledge gathered on the field. Our goal is to contribute to design of a new generation of wellness applications that support long-term motivation and

engagement towards wellness activities. Most of the theoretical background that we use in our design process originates from education and gaming. We hypothesize that their persuasive elements can be applied to the domain of wellness applications, too.

Theoretical Background

One of the advantages of computers as persuaders is their rich possibilities to adapt to the behavior of the users [7]. Adaptive applications are often classified into adaptive and adaptable. Adaptive applications are system-controlled whereas adaptable interfaces are user-controlled [6]. Adaptive game-based learning is commonly used in e-learning to foster the learning process and to make learning more interesting [14]. In game-based learning applications, learning process is personalized as the software recognizes learners' skill level. Software monitors closely learners' actions and updates the user model while playing the game. As learners' skills improve the application moves on more challenging levels [12], which can support engagement. Additionally, adaptive application can generate individual instructions and advices for learners based on their actions [9].

Engagement requires motivation. Malone & Lepper [10] have modeled intrinsic motivation to be built with challenge, curiosity, control, fantasy, competition, cooperation and recognition. Other issues that have been found to relate to engaging the motivation are interaction, feedback, rewards and narration [14]. Interaction helps to maintain users' attention level. Meaningful interaction also motivates to continue the learning process. One of the main objectives of interaction is to understand the goals, and the tasks needed to achieve the goals [5]. Feedback increases the motivation, too [14]. The application must provide feedback so that users understand whether they are doing things right or not [8]. Rewards encourage the user, and engage them by giving confidence to proceed [13]. Finally, narration can be used to support engagement and increase motivation. It enables better interaction between user and application and helps user to immerse in the game. Good narration helps user to accomplish the tasks and achieve the goals while having fun [4].

The behavior of a good player is very similar to motivated and good learner: they try to solve given problems using their existing knowledge and combining that to the new information given. After accomplishing task they are motivated to face new task and challenge on next level. [12] Our goal is to explore if these methods for increasing engagement and motivation could be used in wellness applications, too.

Our Series of Field Studies

During the last two years, we have conducted a series of field studies on engagement and motivational features of wellness applications. Firstly, a set of qualitative in-depth interviews were conducted with active and former heart rate monitor users, and an online survey was launched for the same target group based on the results from interviews [2]. We wanted to study long-term usage motivation and barriers of a commonly known wellness technology. It was found out that the features of heart rate monitors, such as viewing heart rate and calorie consumption, can act as motivating factors towards doing physical activities. The main reasons for decreasing or giving up the usage were the learning effects, i.e. users learned to estimate the training level and energy consumption of the

common exercises they did, and thus the value provided by the device decreased. Other reasons were uncomfortable heart rate belt and the heart rate monitor not being with them when needed. Also, the feedback given by the heart rate monitor was not considered personal enough. However, we were able to identify different user categories, for which different motivational factors and barriers were charted.

In another research project we studied exercisers' motivations to use a mobile tracking tool for outdoors sports [1]. In general, a mobile phone was considered to be a good platform for sports tracking tools. The findings related to motivational factors were the following: (1) usage motivation level can be maintained by providing regular updates to the content of the application or service, i.e. new features and improvements, (2) usage motivation can increase when the user is able to personalize the application for her own purposes, and (3) some users wanted a very simple approach for the application, but more advanced and professional exercisers wanted much more detailed information from the application than was provided.

The most recent research project focused on the cross-cultural issues related to design of wellness application. As most of the research on the domain of designing wellness applications has been conducted in the western, developed areas, we wanted to extend the exploration to the areas not yet covered. During the timeframe of six months, we did an extensive field study in India, focusing on the cultural issues related to wellness in general and user needs towards wellness applications. We conducted in-depth interviews with potential future users and experts, observations and participatory design. As a result we created understanding on the cultural aspects of wellness in India, as well as generated design guidelines and several new wellness concepts. To compare, we conducted the same set of studies in Finland, too. Publishing results are still under process. In the first publication [3] we identified cross-cultural factors for design of mobile wellness applications. The wellness definitions in these two contexts were clearly different. While in Finland the participants placed a lot of emphasis on physical activity, diet and leisure activities, Indians emphasized the role of mental and emotional aspects of wellness. Differences were also observed on places where persons conducted their wellness-related activities. Walking was a popular activity in both areas, but while Finns walked in natural settings, Indians often walked in restricted areas of neighborhood or residential area. Due to long distances, hectic traffic and pollution levels, Indians scheduled and planned their wellness activities more strictly than Finns. In addition, Indians did not prefer similar measurable goal setting for wellness activities as Finns did, because they perceived such goal setting stressful. Instead, they valued consistency of actions. In both contexts, the participants valued a high level of interactivity between the user and application and recording subjective wellness experiences in addition to numerical data.

On the domain of designing mobile wellness applications, many parties are developing and have developed their own solutions. However, scientific evidence of how these solutions really affect wellbeing in a long time period is still missing. Our ongoing study will hopefully give some answers to this topic. We are members of an ongoing long-term controlled trial called Nuadu, where several traditional, mobile and web-

based wellness applications are used by 120 participants, who have been classified as being in a health-related risk, such as being exposed to diabetes 2. The research protocol has been described in [11]. The trial started in January 2008 and will end in January 2009. Our goal is to form life-cycle models of the usage of different kinds of wellness applications, and discuss whether the solutions used in the trial really had an effect on people's wellbeing. The results of this trial will be valuable in understanding the aspects of long-term usage of wellness applications. To our best knowledge, the settings, focus and extensibility of this trial are unique when it comes to this research domain.

Next Steps

By combining knowledge from the theoretical models and frameworks with our field findings and the technological opportunities provided by mobile platform we aim at creating novel wellness concepts to support long-term motivation and engagement towards wellness activities.

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