

INF5261 – Mid-term report

XCSmart

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1. Introduction

In this mid-term report, we will present the preliminary work for the project XCSmart. We are going to present the project itself, what research methods we have as well as plan to use and what we will do for analyzing and testing.

1.1 Group members

Our group consists of Anniken Josephsen, Johanne Oskarsen, Mathias Källström, Cornelia Hensen and Pierre-Yves Ponsonnet. We are five master students, three of us from the *Informatics: Design, Use, Interaction* program, and two exchange students with background in *Information Systems* and *Computer Science*.

1.2 Project motivation & idea

In Norway there is a long and proud tradition for cross-country skiing. Most Norwegians consider themselves as somewhat experienced when it comes to skiing and winter sports. However, there are very few that have good knowledge about the technical aspects surrounding cross-country skiing. Being semi-experienced too inexperienced skiers we believe it would be helpful to create an application based on user-built information. This way users can share information regarding snow conditions such as temperature/density/humidity etc. as well as information on what wax you should use and what tracks are difficult due to for instance lack of snow.

During the last years we have seen an emergence of GPS and context awareness technology being used for health/tracking applications, such as Runkeeper and MapMyRun to mention a few. These applications are mostly used to track parameters such as where, when, speed, duration and in some cases bodily information such as pulse, although they usually require some wearable equipment. One could argue that these apps can be used for cross-country skiing. However, they don't provide any information about the conditions or how you should prepare. By focusing on user input we want to investigate how social collaboration can increase users' knowledge about the technical aspects of cross-country skiing.

1.3 Research question

Our research question is therefore:

How can social collaboration through mobile technology increase users' knowledge about the technical aspects of cross-country skiing?

1.4 Target group

Our target group consists of everyone who enjoys cross-country skiing, and would like to know more about the technical aspects surrounding this activity. Because the information database will be user-built it is important that our target group is rather broad, in order to recruit enough users.

1.5 How to investigate

Our plan is to have a user-centered design process. Therefore, we think it is necessary to perform interviews with skiers of different skillsets to help us establish what information the users might need, and what should be our main focus. These interviews will be conducted early in the process and are an important foundation for the design process.

In order to establish some guidelines of how the information is to be presented, we need basic knowledge about different technical aspects regarding cross-country skiing. We believe it will be useful to have information about the different types of wax and how temperature affects snow density and humidity.

2. Related work

During an experiment within a project called OurWay (Harald Holone, 2008) the researchers found out that users rarely consider the benefits for other users when they provide feedback on a given route, and that they are in most cases selfishly driven. From this they found that rating and user input acts as a by-product of using the application, and that the main activity is finding information relevant to the user's «there-and-then» situation. They also learned that in most cases, the user would not be aware of the other previous or future users of the system. They propose a solution where awareness of other users and addressing issues are related to trust and reputation. This is most certainly a valid point, thus it helps users to assess the importance and relevance of the given information. In addition, it might also lower the threshold of contribution by giving the user a feeling of recognition or accomplishment.

Harrison and Dourish define *space* and *place* as “space is the opportunity; place is the understood reality” (Steve Harrison, 1996). In our case we want the application to be a place or a space with personal adaptation and appropriation because we need some information from the user. This is what they call “place as cultural phenomenon”. They also discuss the different types of places and spaces. The most interesting model for us might be “complex forms: Space-less Places” because it has no physical space. They develop the idea of discussion and navigation without physical space. In our case the “navigation without physical space” or social navigation is exactly our objective with people sharing information about the snow quality and tracks difficulty.

Bilandzic et al. wrote a paper which describes the development of *CityFlocks*, a “mobile system enabling visitors and residents in a city to tap into the knowledge and experiences of local residents” (Mark Bilandzic, 2008). This article is relevant for us because we want to use the regular user’s data to guide the beginners. It works also for experienced people who don’t know the tracks possibilities yet because they don’t live in the same area. The authors studied different ways to get information from the user as direct and indirect contact between the users who have and those who want the information. We can use their thought and conclusion in addition to our research to define the best strategy to collect and distribute the information.

Tamminen et al. describe in their article a study they executed where they dealt with the question “how context-aware computing might make its place in mobile activities” (Sakari Tamminen, 2004). They wanted to explore how external factors influence the use of context-aware systems. Even if the study dealt especially with navigation in urban environment the characteristics of mobile contexts as well as the findings and the design implications can be adopted to our project because our App is meant to be used at home to plan a trip as well as outside while skiing. For example, if you are taking a long trip for several hours you maybe want to check if the wax you are using (and need to renew) is still the right one or if it has changed because of new user recommendations.

The study emphasizes especially context changes that occur while moving. As said above the context of our App will change continuously because of user updates. Furthermore, the authors were interested in the majority of people. Regarding this point, the participants in the study consisted of all kinds of people. Our target group also consists of all kinds of people as long as they ski. Some of the given design implications can be adapted to our project. For

example, they recommend using vibration to indicate that one's bus is approaching the bus stop. We could also use this concept to inform the user that the recommended wax for his/her route has changed.

Karstens et al. investigate how existing techniques of visualization of complex information "can be adapted or redesigned for mobile pocket-sized devices" (Bernd Karstens, 2003) with limited resources. The screen of a mobile device offers very limited space so that they wanted to identify new techniques for searching and finding information that avoids spacious scrolling. The paper states techniques that address different requirements we also have to deal with in our project. For example, they describe a few techniques regarding information hiding that can also be very interesting for us. Our Application will show an average of the user recommendations regarding the wax based on user data. If the user wants to get more detailed information about how many recommendations each wax got he/she should get the opportunity to get this hidden information. In this representation "only interesting parts of the hierarchy remain visible in the display" (Bernd Karstens, 2003).

3. Methods

In this section, we will present the methods for data collection, prototyping and user testing.

3.1 Data Collection

After brainstorming ideas, we had an initial idea for an app, but we had a lot of different thoughts on what the app should do, and what our main focus should be. We needed to collect data from our target group to narrow our focus, and to gather information on what issues the user group encounter while planning or during a skiing trip to make sure our prototype would address their needs.

We had some overall goals for our data collection; we needed to know what the typical user needs from an app like this, if they're motivated to collaborate in social communities, and what information they were most interested in getting while planning a skiing trip. To make sure our app was not trying to address a need that is already being covered, we also wanted to investigate what apps people in our target group are already using. The main concepts we wanted to look into was in what way users are interested in real-time information from other

users, and if they have any constraints on what they would like to share themselves. We also touched upon the gamification aspect and thoughts on GPS-tracking.

To get the information we needed, we chose to triangulate different data collection methods. We decided on using two methods; surveys and interviews.

3.1.1 Survey

We created the survey to get an overview of people's motivation to go skiing, what information they are interested in before and during a skiing trip and if they are willing to share information about their own trip. We decided on doing a survey mainly because of the time constraints. By conducting an online survey, we were able to get data from a fairly large amount of people in a short period of time. This way, we were able to get an overview of our potential users and to narrow our focus based on key findings in our survey. With a short amount of time and our need to get information quickly we wanted to form a survey that did not require too much from the user by making it short and concise. From experience we know that by using yes/no questions, scales and checkboxes, more people will do the survey and the analysis of it will not be as advanced. We can assume that only those who likes cross-country skiing would use our application, so our first question was to exclude those who do not like cross-country skiing. By asking this we can know that our data will be from our potential users. The survey was shared on Facebook, and that will limit the age range for the participants since most of our Facebook-friends will be around the same age as ourselves.

3.1.2 Interviews

We conducted several interviews to get a deeper understanding of the users' motivation and what issues they encounter in relation of planning or going on a skiing trip. Our main goal for the interview was to gain a better understanding of the user needs and to explore the problem space further.

The participants we chose for the interviews are all people we know to be active, and who likes to go cross-country skiing in the winter. We chose to do unstructured interviews with open-ended questions. Since several of the group members can be said to be part of the target group, we did not want our previous knowledge to create biased data. By using an unstructured type of interviews, we thought the users would be more likely to present their thoughts and needs, instead of just confirming our beliefs. We wanted the participants to

speak freely of the subject, but we made sure the conversation did not trail off during the session.

3.2 Key findings

We have now collected both qualitative and quantitative data, and for now we have not analyzed it deeply, but we have an overview of our key findings.

In our survey we got an overview over why people go skiing and about what kind of information they want before they go. Our results show that most people go skiing either for exercise or to explore the nature. We could also see that most people wants to get information, but are not that willing to share the same information. It will be important for us to focus on getting people to share information when we start our design process, to make sure that we get user input.

In our interviews we wanted to look deeper into what people find hard about skiing, and we wanted to get a better understanding about their thoughts around this topic. Early on it was clear that no matter what skill level you are at, knowing what kind of wax to use is difficult, and people struggle with this decision every time they go skiing. Especially when it is plus degrees outside. None of our participations are professional cross-country skiers, but they go skiing every winter. Most of them were at our age (between 20-30), so this means that they are digital natives and uses their smartphones more frequently than digital immigrants. We will assume that these will be our main users, because of both, skill levels and age.

Further on we want to analyze and use our data to find our functional requirements before we start our prototyping progress. For now, our data collection gives us a better idea of what we should focus on further and what our main goal with this application will be.

4. Future plans

In this section, we will present what we plan to do further in our project. First of all, we will analyse our data from the interviews and surveys more thoroughly. By doing this, we will prepare for the prototyping and user testing.

4.2 Prototyping

We are planning on using different methods for our prototyping. In the early stages of our project, we are going to do low-fidelity prototyping to get early feedback from potential

users, while we plan to make prototypes of a higher resolution later to be able to do usability testing.

4.2.1 Low fidelity

For our low-fidelity prototypes we are planning on using pen and paper, and will both make simple sketches to communicate our design ideas, and wireframing to plan the app layout. We will use our low-fidelity prototypes to get feedback from our potential users, so that we can start making the high/mid-fidelity prototypes.

4.2.2 High/mid-fidelity

After testing the low-fidelity prototypes with users and analyzing the outcome, we are going to make a prototype of higher resolution. We have looked into some online tools to do this. These tools enable one to create a real looking and visually functional prototype without programming. As we don't have that much time to develop the prototype these tools provide the possibility to create a prototype fast without losing the option to implement as much functionality as possible. By developing prototypes of this kind, we plan on doing a more structured kind of user testing.

4.3 User testing

During the design process we will use iterative user testing to make sure that we maintain the user's interests. Then after developing a mid/high-fidelity prototype we would like to perform an in depth usability test. Based on the feedback from the users we can change and improve the mobile application.

5. References

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