Group 1

The Design Report – Outdoor Sports

HCI – Analysis INF661

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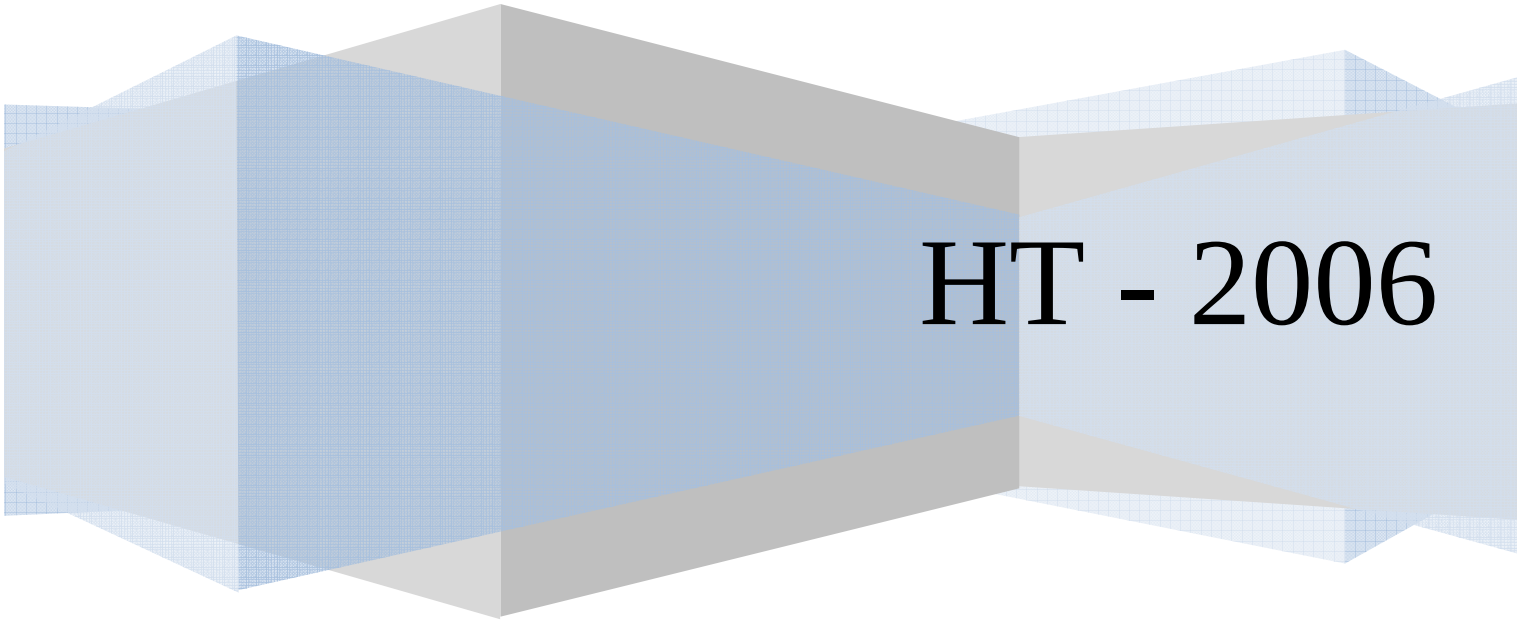

HT - 2006

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Introduction

Our design project is based on a case called "Outdoor Sports". The ski resort that is located in Sicklafjäll, in Dalarna (swe), is in need for improvements of the way they are handling their guests and information. Their main concept that they wish to preserve, apart from having the same activities as other resorts, is to give the best service to their guest by adding value for the guest experience. This is achievable by giving the guests "Small Extras" and is an important part of the business concept in order to keep guest coming back. As it is today the ski resort have several problems in different areas, e.g. with booking system, lack of information about guests (history) and non updated information for staff in the field etc. In this report we are presenting one solution for one of the problems, *provide relevant and updated information to the guests and working people in the field that is easily accessed*. After identifying needs and establishing requirements from our users we focused on finding the design that would fulfill the user's needs in an optimal way.

For our design process we have used techniques and methods proposed by Preece, 2002 but also used very rewarding discussions with different designers and users. The fundamentals parts that lead to our final design can be found in the results of evaluation in different stages of the design process. We based our evaluation on unstructured interviews and discussions with five users with different backgrounds and ages.

The result of the problem solution is called "Information terminals" and these are located all over the ski resort so the users have a fast and easy

access to the information that they need. This information is based on the activities, weather forecast and personalized information or updated schedule. The RFID technique is one part of solution that is used to identify users and provide personalized services.

1 Problem space

When you start the interactive design process it is important to understand how the users interact in the specific problem space (Preece, 2002). As it is today the guests at the ski resort get their information verbally form the office staff. This is time consuming for both the guests and the staff due to the fact that the guest has to either go to or call the information desk for information and this puts pressure on the staff which are already over loaded with work. To gain more understanding for the problem space we choose to use the framework for explicating assumptions (Preece, 2002) and answer the questions within.

Are there problems with existing product?

Today there is no existing product for information support that can be used by guests and staff working in the field.

Why do you think your proposed idea might be useful?

Our idea is to bring the information to those who need it and try to make the information more available for the user. Our thought is that the users can be able to interact with the information in the field. They don't need to get in contact with the office staff to receive relevant information.

How will your proposed design support people in their activities?

By building several Information terminals on the field the users can easily access their relevant and needed information. They can get both

personal and general information with out big interruptions in their activities.

Will it really help?

Our proposed design is going to support both the guests and the staff members, by the means that it will provide more accessible and up to date information as a "small extra" for the guests but also for field staff.

Interactive development process

The activities that are necessary for us to carry out in the design process are the ones shown in figure 1 (Preece, 2002). We started by identifying the users and their needs and by the information collected we could establish requirements. The requirements are the foundation of our proposed design. Through the design process we evaluated our designs in different stages, which will be explained more in detail later in this report. From the evaluation results we re-designed our prototypes in order to better reach the users requirements and needs.

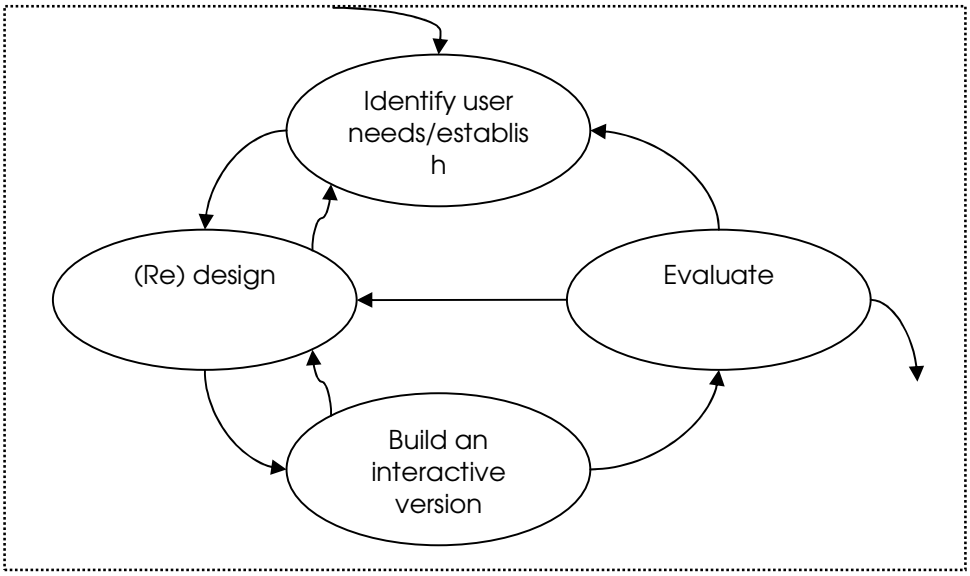


Figure 1. Interactive development lifecycle, from Preece, 2002.

1.1 Who are the users?

The definition of users is those people who interact directly with the product to achieve a task (Preece, 2002, s 171). But there is another way of looking at users were you can see the user as the one who manage direct users, those who receive products from the system, those who test the system, those who make the purchasing decision and those who use competitive products (Holtzbatt and Jones, 1993, s 171). Another way of viewing users is by dividing them into three categories; *primary users*, *secondary users* and *tertiary users*. We choose the later definition due to the fact that it is easy to take in the whole picture of the user.

The primary users are those likely to be frequent hands-on users of the system (Preece, 2002). In our case we define our primary users as the guest which have a membership and therefore receive the opportunity to log into the information terminal. These are the most likely guests to use the information terminal on a regular basis.

The secondary users are occasional users or those who use the system through an intermediary. We see our secondary users as the ski instructors which occasionally can use the information terminal to get information, but this is not there primary information source. Secondary users can also be the guests which don't have a membership and therefore only get access to the general information provided in the information terminal.

The tertiary users are those affected by the introduction of the system or will influence its purchase. In this case we identify our tertiary users as the staff in the booking office which will update the information in the terminals by using their booking system. The booking staff can also be

affected by the fact that the guests have an additional information source.

1.2 Context of use

The context of use refers to the circumstances in which the interactive product will be expected to operate (Preece, 2002, s 207). Here we consider four aspects of the environment; the physical environment, the social environment, the organizational environment and the technical environment.

The physical environment is referring to how much lighting, noise and dust is expected in the operational environment. Will the user need to wear protective clothing that will affect the interaction? How crowded is the environment? In our case the physical environment is weather dependent and often has cold climate which means that the users has special clothing like for example a warm jacket, ski gloves, ski goggles or a ski helmet. They also have special equipment on there feet and in there hands like skis, snowboards or ski sticks. The surroundings could also be a crowded place depending on the season and this means that it could be noisy.

The social environment refers to the social aspects of interaction design, such as collaboration and coordination and need to be explored in the context of the current development. For example will data need to be shared? If so, does the sharing have to be synchronous? The social aspects of interaction in our case are mainly focused on the information which has to be synchronous so that the user gets the right information from the information terminal and not incorrect one.

The organizational environment is pointing to how good the user is supported and how easily it can be obtained and also if there are facilities or resources for training. How efficient or stable is the communications infrastructure? How hierarchical is the management? The Sicklafjäll ski resort is user oriented in there business concept and their main goal is to offer the guests a positive experience on snow and is in there present organization non-hierarchical with focus on the guests experience. The organization does have one shortage with the communication infrastructure where there is poorly outdoor communication.

With the technical environment one means for example what technologies will the product run on or need to be compatible with and what technological limitations might be relevant? The Sicklafjäll resort has a booking system which collects the information in a database which could affect the Information terminal. Also the weather conditions could have an affect on the technology in the terminal.

1.3 User requirements

The user requirements should capture the characteristics of the intended user group on the basis of the context and the actions that takes place when the users interacting with the product. From the user analysis and the context analysis we come up with the following user requirements.

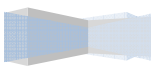
PRIMARY USERS:

Easy to operate: We identified our primary users as member guests and therefore we have a broad user target when we look at facts like computer habits and technical skills. A very simple and easy maneuvered terminal is to aim for.

Easy to enter: The information terminal needs to be easily accessed even with nonflexible clothes, gloves and other equipment since the users often operates in these conditions. The fact that they would need to adjust them self just to use the information terminal, for example if they need to take there gloves or skis of before entering the terminal, increases the fact that they wouldn't bother to seek for information.

Interaction requirements: Due to the some times crowded and noisy surroundings the interface should exclude sounds, for example use sounds for interaction. The interaction should instead be with easy operated buttons or touch screen which can be operated with gloves on. The Feedback should be provided only visual.

Appealing interface: Since the user target is broad in both age, gender, nationalities and technical skills the requirements on the interface differs a lot among the users. The younger users might have different requirements than the elderly users. Therefore the interface has to be appealing to a broad target group.

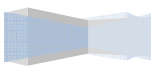


Information requirements: The information provided in the information terminals has to be up to date and synchronized with the booking system so that the guest will receive the right information.

Functional requirements: The primary users are identified as members of the ski resort and the information they would like to have access to the schedule for their bookings so the risk that they miss an expensive lection decreases. Because the ski activities are weather dependent the user could benefit from getting up to date weather reports so that they don't get in to unnecessary dangerous or displeasing situations. A small extra that is available to the user is a bonus points system and information about the guest's current bonus is one thing that could be useful. Since the guests are from different nationalities a language selection should be accessible as well. A common problem is people getting lost their friends, family or ski group on the slopes so a tracking function that shows information about other related guests would be very useful and make the skiers feel more secure. It also can save lives in the uncommon occasion that someone got lost offside the slopes having an accident, which would be very crucial.

SECONDARY USERS:

Communication requirements: The secondary users are in need of a better way to communicate. But that is not the task of the information Terminal. So it only supports a one way communication to give the ski instructors up to date working schedules and the same information as for the primary users. Optional it could also provide a one way message system.



TERTIARY USERS:

No extra work: The information terminal should not be extra work for the already over loaded staff people but instead reducing their work. It shouldn't require maintenance work.

Durable information terminal: The information terminal has to stand up to the weather conditions, for example when it snows a lot or if there are strong winds. But it also has to stand up to the sun and also be water-repellent.

2 Information Terminal

2.1 Scenario: Interacting with the Information terminal

Linda is a 24 year old swimming trainer and has not so good experience in using computers. She has only used Word to write simple documents and smaller reports. Until now it's her third time that she is visiting the Sicklafjäll skiing resort. She got a recommendation from a friend, which has been in the ski resort two weeks ago, that there's a new simple information system, where you are able to search for activities available and diverse information such as future events, changes in lesson & schedules and other relevant information. The only thing you need is your member card to use all functions of that system. She decides to try out this new system to see if she can find something that she perhaps should be aware of. She goes to the information terminal next to a lift and gets surprised, when she reads: "Hello Linda, how can I help you today?" At the main screen she sees a menu to browse through all the information given, for example "today evening activities", "new offerings", "information about lift activity" and so on. She presses on the evening activities and sees that there's a special members dinner at nine o clock at night in the member restaurant "Snowflake". Linda decided to go to that dinner. After login with her personal password she sees that there are less than 10 seats available, so she makes a single reservation. Afterwards she logs out from her account and looks at the weather forecast for tomorrow and walks away.

2.2 The information terminal design

We have identified a lack of information given to both, the guests and the staff. They should be able to access relevant information about the weather, ski lift conditions, events & activities, location and schedules (staff only). Our Solution to this problem is information terminals placed at central and important spots in the resort. They would be accessible using RFID technique with the same chip card as for the lifts. This offers the opportunity of having personal information like schedules or upcoming ski courses depending on who is standing in front of the terminal. The navigation should be as simple as possible and it should be easily usable with gloves, too.

3 Interaction design process

3.1 Re-design (Information Terminal)

Physical constrains and space

Besides designing our interactive interface we also designed the booth of the terminals just to get the right context of the interaction. Our information terminal booths are constructed as igloos with an information sign, in well visible and recognized colors, on the top. This shape and form grow out of our first design (see figure 01). When we evaluated the fist design sketch we used a designer to get his expertise view. We discussed the proposed design from different angles, and he questioned for example why we used a screen as interaction device and not a projector which made the screen visible on the wall inside the information booth.

The expert also questioned the narrow opening for the skis and thought this was a bad idea because this could quickly fill up with snow and dirt and then lose its functionality. The second thing that he questioned was the opening in the terminal. If the wind blows in that direction the terminal will not be protected from snow and cold. Another big issue to the evaluator was the fact that it could only be used by one guest at the time which means that the risk for a queue building up is high. He also questioned that the screens were firm to the wall and that they were non adjustable for different heights. Due to the fact that it is a touch screen it has to be reachable to all guests who would like to use it. Another big issue for the expert was the fact that the information terminal booth lacks

a clear sign of what it is. The question we got was; how can the users know what the booth is for?

From these remarks we did a re-design and come up with the new shape to give the terminal more space (see figure 02). The idea that we could use projectors to show the interface on the booth wall we did not see as an option because we thought it would be to high-tech for this ski resort and if the guests wanted to enter the screen with their skis on it would be impossible. The shape of an igloo was created due to the fact that it is designed for a ski resort and we wanted the terminal to blend in with the environment. But on the other hand it should not blend in to much in the surroundings and there fore we stuck to the material for the first design where we suggested Plexiglas. This material also works as a protection for bad weather conditions and sunbeams which the screens need to be protected from. The booth should also be easy to maintain and the snow should be prevented from packing on the roof of the terminal. The Plexiglas can easily get a round shape and there fore the snow will glide of the roof. The Plexiglas is also a durable material which is necessary in this weather conditions.

These igloos should be able to take about 4 to 6 people and an entrance should be wide so that people can go through in and out at the same time conveniently. We also changed the screen from one screen to four screens to prevent a queue from building up (see figure 03). The four screens are placed in the middle of every igloo and should bee easily accessed so that users with theirs skis on can also reach screens without any problems. We placed screens in the middle of the Igloos because this provides flexibility and convenience for our users. There should be approximately 1 m distance between every screen so that users can get

their privacy but also be more mobile. The screens are fastened on a metal frame and are able to be adjusted in up/down directions, so that even handicapped people can use them. The Plexiglas is a see through material which also helps the guest to quick and easy see if there is any free information screens available in the Igloo booth. The sign problem was solved by putting an international information symbol sign on the roof of the igloo. In this way the guests could easily understand the purpose of the booth. The information sign could also be used as a location light in for example a thick fog. The igloo would work like a mountain lighthouse where the information sign is lighted up and rotated.

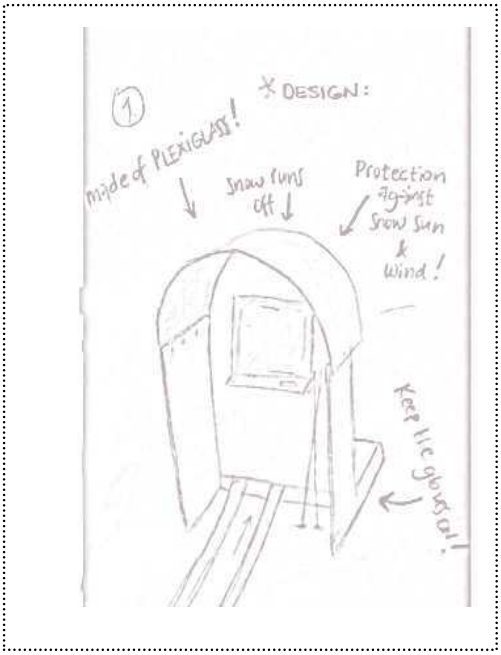


Figure 01 Design proposal nr1

Figure 02 Design proposal nr2

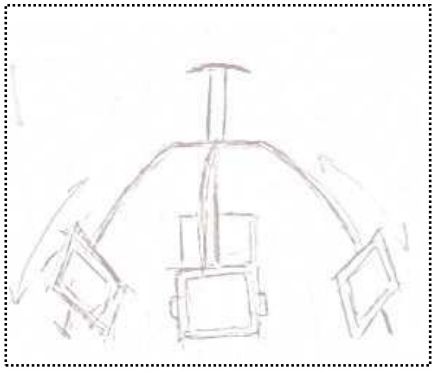


Figure 03 Screens in design proposal nr2

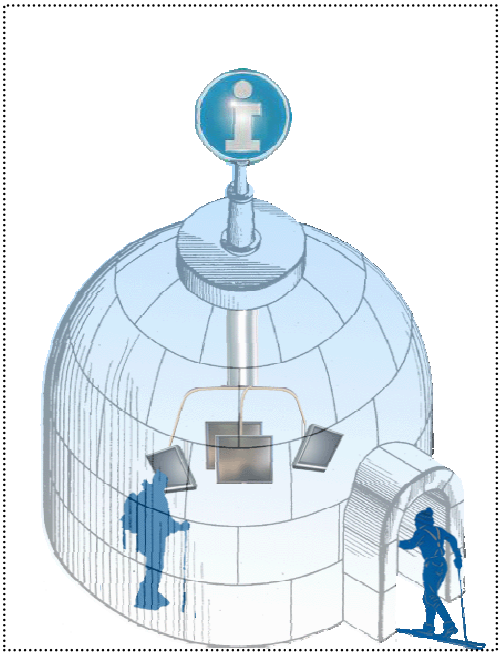
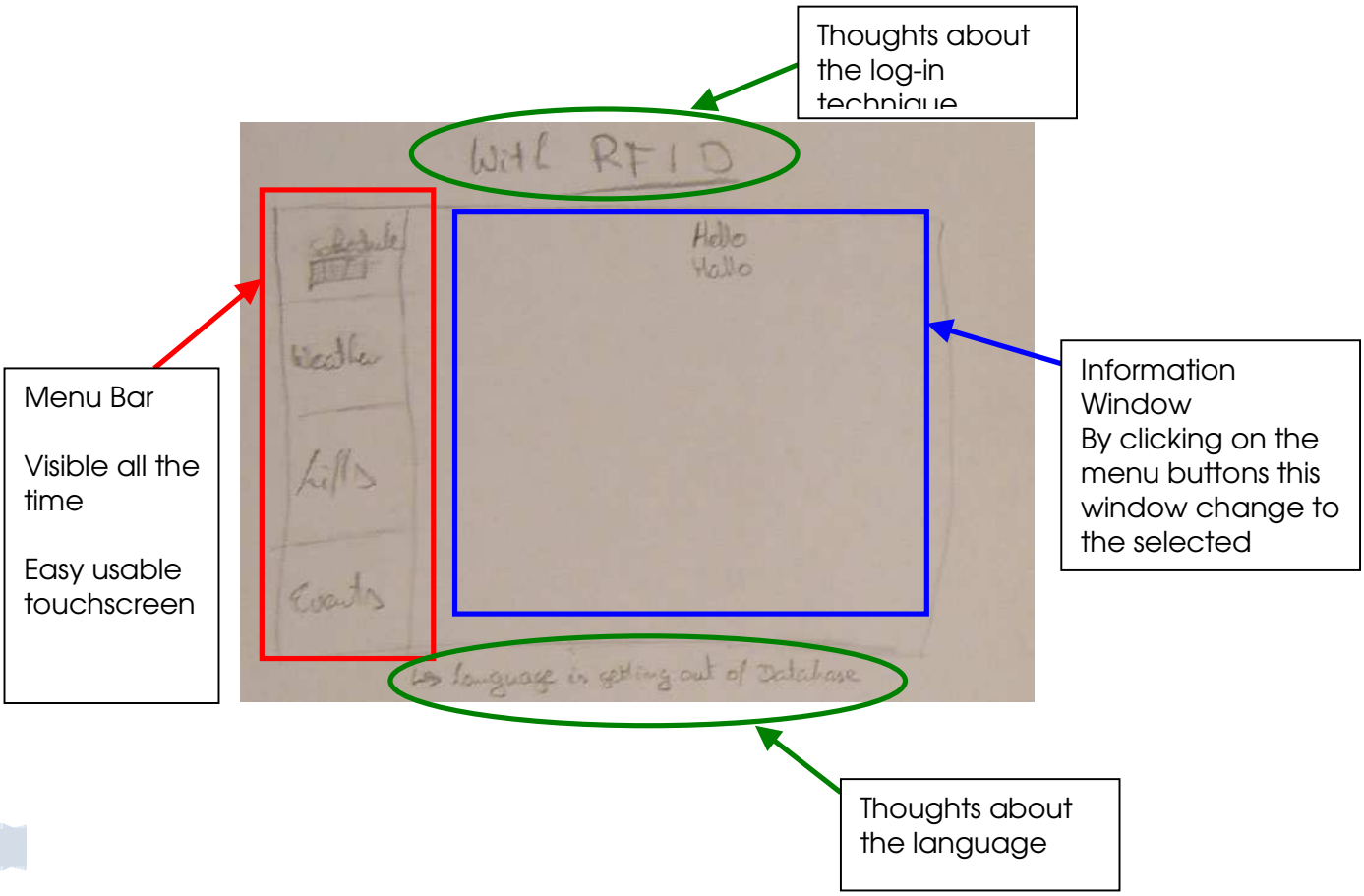


Figure 04 Design proposal nr2

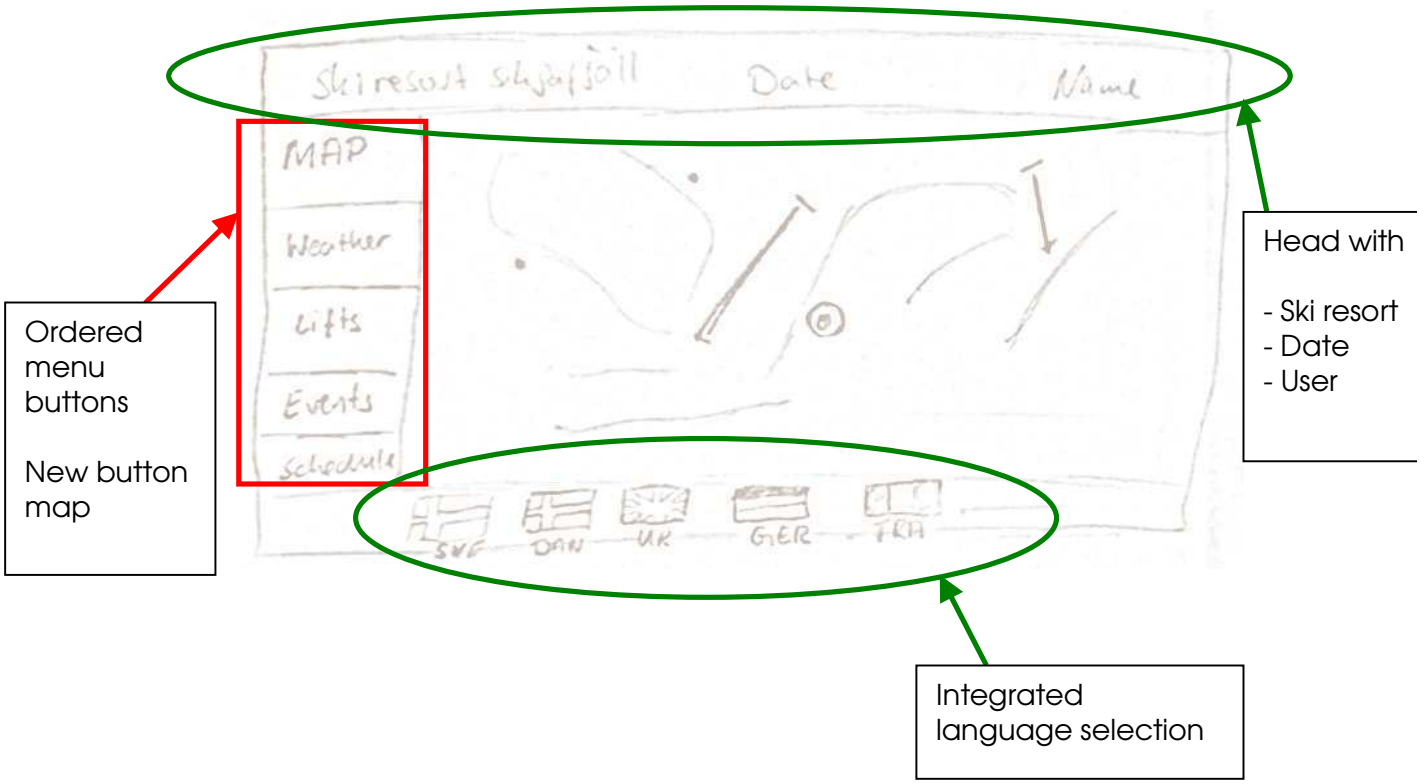
3.2 Interface Design Information Terminal

For our first interface design we thought about touch screen, because the user in the ski resort could use the information terminal without taking off their ski gloves. Our first sketch shown here is ordered in some kind of a webpage, where the menu bar is on the left site and the information window to the right. We also thought about the log-in technique we want to use and how we can provide different languages, but at this stage we didn't implement them.



After the first user evaluation we decided to integrate a map with a tracking system. We sorted the menu buttons in a new way. We also

implement the languages as flags on the ground of the terminal and on the head the name of the ski resort, date and logged in user. We also thought about to use symbols and text for the menu bar, because it's easier for the user to see the functions behind the buttons.



This is our final design of the page for the terminal screen. There's a welcome page with information for user to handle with the touch screen. We changed the menu buttons, so now there's the text and a small picture that helps to understand the functions.

4 The Location Function

4.1 User requirements

Starting from the location function of our prototype, which just showed a zoom able map of the ski resort and dots for related people, we made some unstructured interviews with potential users. Our aim was to get to know, what utility goals they want to achieve with the function and how they want to use it, which refers to the goals in effectiveness, efficiency and learn ability like Preece (2002) introduced them. After the first interviews we came up with several ideas and evaluated them in the next interviews by explaining them with sketches to the interviewees. So this was a continuous evaluation process.

That resulted in three user needs for the functionality:

- **1. Overview:** Users want to get an overview of where they are and where related people are
- **2. Search:** They are searching for one or more specific (related) persons
- **3. Details:** They want to know which of their related persons are near to their actual position

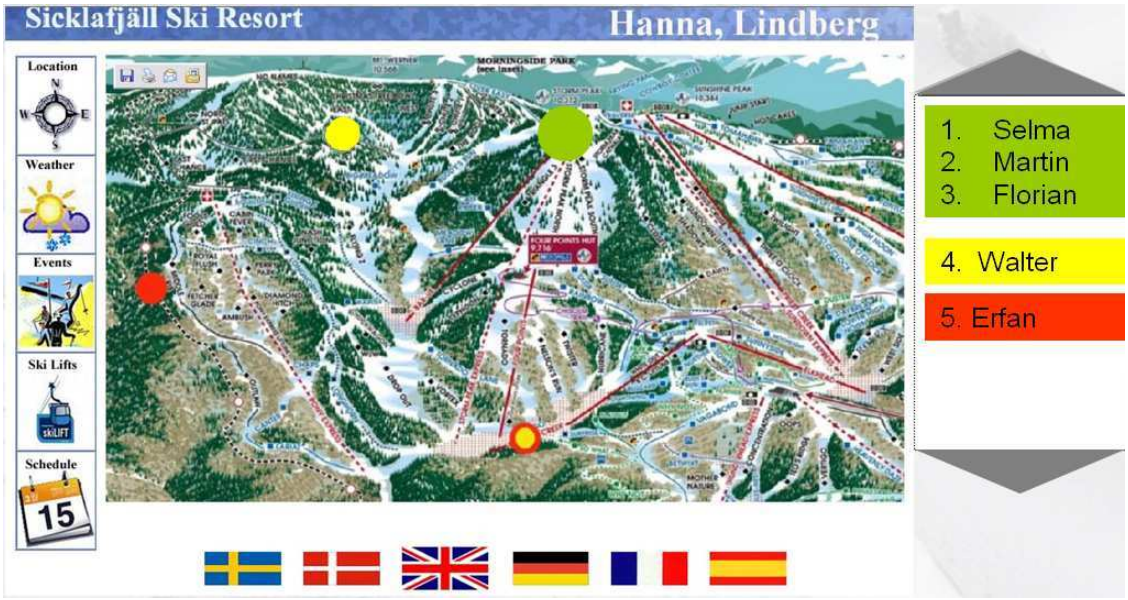
It is relatively easy to achieve each of these needs while keeping the system easy to use. But it was a big challenge for us to achieve them all in one.

4.2 Design process

In our first Prototype we only had a red point for every related person on the map. Of course the users want to identify the different people. The first idea was to put the names next to the points. This could result in a very crowded screen, so our test users had problems with the overview and the search functionality.

The next idea was to mark the points with a token and explain these tokens in a list on the right side of the screen. For the search we had the idea of pressing on a name on this list, to get this person blinking on the screen. This function got very good feedback. For the tokens we came up with numbers or initials. Initials have the advantage that it's more intuitive to identify the person, but it can also be confusing and the numbers need less space. Since most of the users preferred the use of number we decided to go with that alternative. We also put scroll up and down buttons on the top and bottom of the list, which was very intuitively understood by our test users, so there was a good learnability in that.

There was still a problem which was that the overview was lacking when there would be many dots in the same area. So we decided to group them and make a big dot out of it. We came to the conclusion that the names in the list also had to be grouped. To divide the groups more sharply, we colored them differently, so did we with the dots in the map. The search function of course worked in groups, too. So there was a good overview and search functionality. Humans are able to differentiate between many different colors and our test users said that they mainly associate the dots on the map with the names one the list because of the colors and not the numbers. Also, with many people in one group it gets crowded again. So we have cut them out on the map screen.

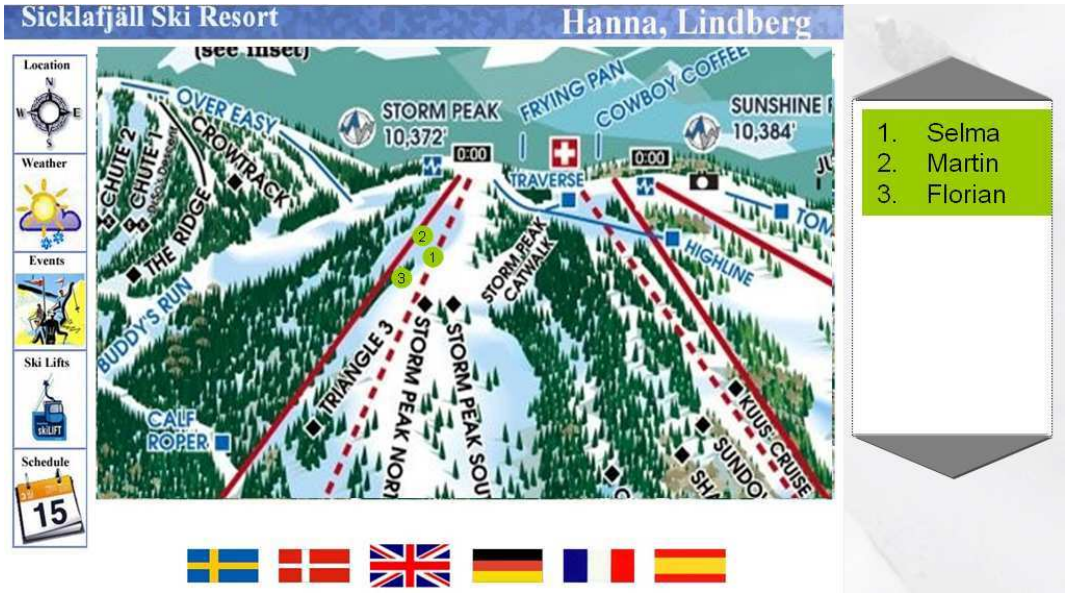


A picture of the location function offering an overview

The next point to focus on was to offer details of any part of the map. We were thinking of a zoom-function. We found again two options here, which were a two-level or a multi-level zoom. In the interviews we

recognized that the latter option would be too complicated for many users, because it would need a zoom in and out button and a two-click action or something like a cursor, so the user knows to which part of the map he is zooming into. The two level zoom, where the user touches on the part of the map he wants to zoom in and just touches anywhere on the map to zoom out again, was clearly preferred. It keeps the function easy to learn and to use, while offering enough utility.

Zoomed in every related person on the map is represented by a dot in the same color as it was in the zoomed out mode. This makes the both modes consistent. There is also a number on each dot, which is also in front of the name in the list on the right side. The search function now locates single persons even they have been grouped in the zoomed out mode. This is also consistent because it always searches for dots on the map. The test users said that it is confusing, when you want to search for a person which is not visible on the map at the moment. We decided to use a constraint here, so that related persons, which aren't on the map because of zooming or they aren't at the resort, also disappear on the list on the right side. This also increases the overview for the user.



A picture of the location function zoomed in

The last issue we had to decide was, if map should be updated instantly, so that the dots move while looking at the map. Technically that's possible and it would give the user additional information while also be sort of entertaining, because then you can really observe how your friends go down the slopes. So it would also cover user experience goals. Of course users liked that idea. The only downside is that this could result in longer queues, because people are misusing the terminal.

So at that point we have achieved our three usability goals to offer an overview and details of the map and to have a search function. Our last evaluations results show that at the same time the system offers a good learnability, effectiveness and efficiency.
The next steps would be to work on a new prototype with a more details in design to make interactive evaluations.

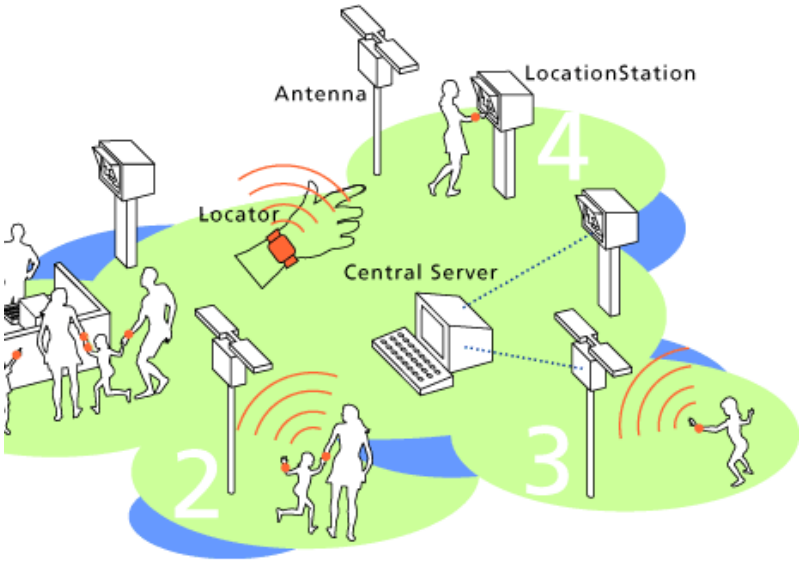
5 Radio Frequency Identification (RFID)

RFID is an automatic identification method, relying on storing and remotely retrieving data using devices called RFID tags or transponders. An RFID tag is an object that can be attached to or incorporated into a product, animal, or person for the purpose of identification using radio waves. Chip-based RFID tags contain silicon chips and antennas. Passive tags require no internal power source, whereas active tags require a power source.

An RFID system may consist of several components: **tags, tag readers, edge servers, middleware, and application software**.

The purpose of an RFID system is to enable data to be transmitted by a mobile device, called a tag, which is read by an RFID reader and processed according to the needs of a particular application. The data transmitted by the tag may provide identification or location information, or specifics about the product tagged, such as price, color, date of purchase, etc. The use of RFID in tracking and access applications first appeared in 1932, to identify aircraft as friendly or unfriendly. RFID quickly gained attention because of its ability to track moving objects. As the technology is refined, more pervasive and possibly invasive uses for RFID tags are in the works.

In a typical RFID system, individual objects are equipped with a small, inexpensive tag. The tag contains a transponder with a digital memory chip that is given a unique electronic product code. The interrogator, an antenna packaged with a transceiver and decoder, emits a signal activating the RFID tag so it can read and write data to it. When an RFID tag passes through the electromagnetic zone, it detects the reader's activation signal. The reader decodes the data encoded in the tag's integrated circuit and the data is passed to the host computer. The application software on the host processes the data, and may perform various filtering operations to reduce the numerous often redundant reads of the same tag to a smaller and more useful data set.



Identification and tracking of persons using RFID-tagged items

A method and system for identifying and tracking persons using RFID-tagged items carried on the persons. Previous purchase records for each person who has its member card collected by POS terminals and stored in a transaction database. When a person carrying or wearing items having RFID tags enters the ski lift or the information terminals a RFID tag scanner located there in scans the RFID tags on that person and reads the RFID tag information.

The RFID tag information collected from the person is stored in the database. Based on the results of the correlation, the exact identity of the person or certain characteristics about the person can be determined. This information is used to monitor the movement of the person through the ski resort area at the information terminals. If the person is near the information screen, a personal welcome page is shown on the display. For ski groups and families we offer the possibility to use the tracking system to see where the others of the group or family are at the moment. This RFID technology is also used for the comfortable lift, where the skiers are able to use the lift without showing or inserting a card.

When the person is given a wristband or a key tag, a signal is sent to the database that identifies someone as a family or group member. Two kinds of RFID tags reside in the tag.

The active RFID tag can then find the family or friends. The RFID device is the identifier, which connects with the active tag that identifies the location.

While the active tag communicates a person's location, the passive RF tag automatically identifies visitors as they approach the touch screen kiosks and scan their wristbands or keys, linking them to onscreen icons marking the individual location of any member of their family or group within the resort and resort base. The instant, real-time location of group members and amenities enables new levels of visibility and safety for groups and families.

6 Conclusion

In our report we talked about the process of interaction design. We involved the four basic activities to produce a functional prototype: at first we identified needs and established requirements for the user of our terminal. Afterwards we developed alternative designs in use some modes to meet the requirements which were established in the first part of our interaction design process. Before we build an interactive version of the designs we evaluated our designs with an industrial designer, he pointed out some small problems within our design and so we had to re-design our alternatives. In order to follow the interaction life-cycle we had many steps of re-design and evaluation with users till our final prototype was finished.

6.1 Our remarks on the design steps

User needs:

Requirements were based on the case description we have been given and the factor that we were not on a ski-resort where potential user could be involved in the design process made it difficult to identify the needs. The lack of an interactive model in a natural environment for getting user needs after evaluation, could lead to a lack of important information.

Alternative Designs:

It's not easy to develop different or alternative design, because we only had few users and not much time to evaluate some alternative designs.

Building interactive versions:

We build an interactive version of our design, but we couldn't test the interactive version in a natural environment. We had no touch screen and not the real size for real user evaluation.

Evaluating:

After this design process we think that evaluation in different stages could have done differently by the means that we should have used some other evaluation methods for example usability testing with specific tasks. It would be even better results, if we had opportunity to evaluate with predictive evaluation with expertise knowledge. What we have now evaluated is evaluation mostly based on our own experience and knowledge.

6.2 Our personal remarks and Presentations

It was a lot of fun working in groups and doing a whole design process was very interesting and helpful to see the world from the designer perspective and how the user experience influenced the design and redesign. The time was much delimited, so sometimes the evaluation process and design process had to be shorten down and this had an effect in the result.

INF661 – Design Project

OUTDOOR SPORTS

Martin, Selma, Erfan, Hanna, Florian, Walter

Content listing

- Solution & Re-Design
  - Commnication
  - Booking
  - Information
  - Web Site
- Scenarios
- FAQ

Solution

- Communication
  - Identified needs
    - Correct and immediate updates
    - Stable connection
    - Reduce manual communication
  - Device
    - Easy Use
    - Efficient & Effective
  - Small Extras
    - Guests feel known and pleased

Solution

- Booking System
  - Identified needs
    - Faster booking process
    - Easy navigating
    - Online Payment System & Control
    - Information and background about guests
  - Design
    - Intuitive GUI
  - Small Extras
    - Extra Booking

Solution

- Information
  - Identified Needs
    - Schedule
    - Relevant Information
- Terminal
  - RFID – Technique
- Small Extras
  - Special Member Offers & Events

Solution

- Web Site
  - Identified Needs
    - User-friendly
    - Provide Feedback
- Design
  - Intuitive GUI
- Small Extras
  - Member Area (LogIn)
  - Online Payment

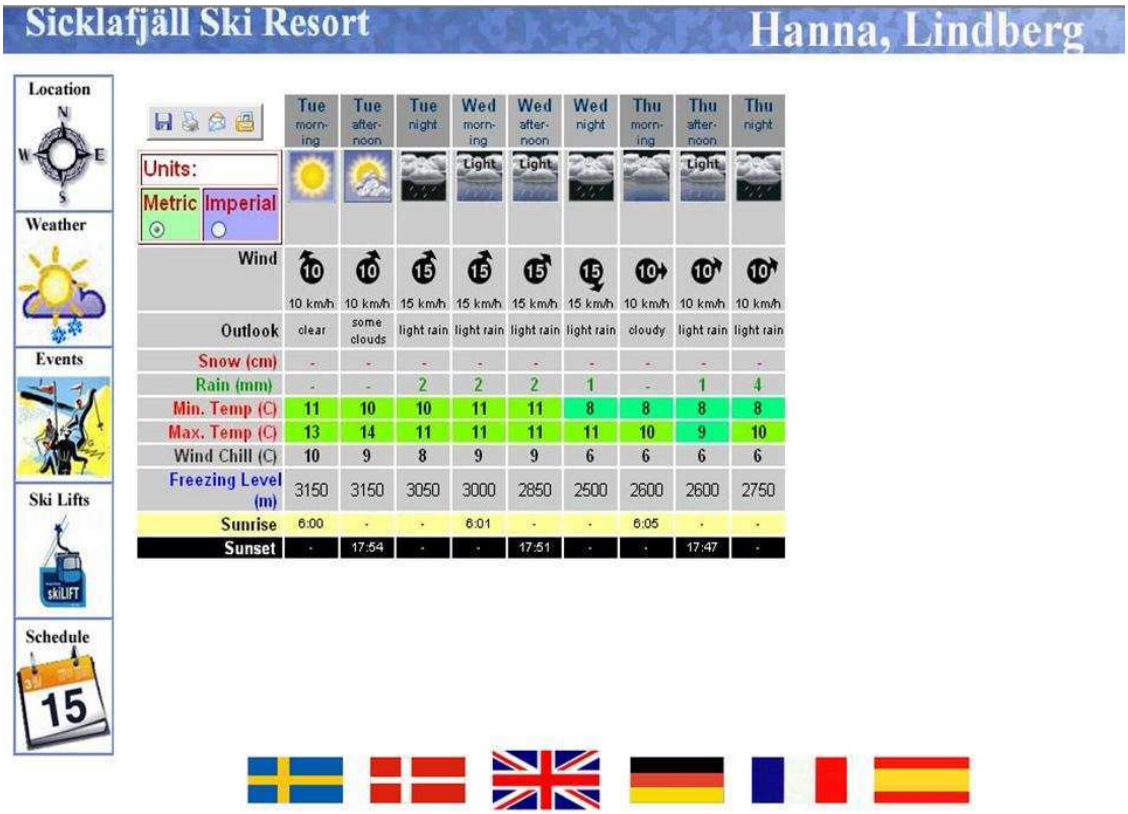
- Linda is a 24 year old swimming trainer and has not so good experience in using computers. She has only used Word to write simple documents and smaller reports. Until now it's her third time that she is visiting the Sicklafjäll skiing resort. She got a recommendation from a friend that has been in the ski resort two weeks ago, that there's a new simple information system ,where you are able to search for activities available and diverse information such as future events, changes in lesson schedules and other relevant information. The only thing you need is your member card to get entrance to that system. She decides to try out this new system to see if she can find something that she perhaps should be aware of. She goes to the information terminal next to a lift and gets surprised, when she read "Hello Linda, how can I help you today?" At the main menu she sees the submenus that she can choose to browse further into, for example "today evening activities", "new offerings", "information about lift activity" and so on. She presses on the evening activities and sees that there's a special members dinner at nine o clock at night in the member restaurant "Snowflake". Linda decided to go to that dinner. After login with her personal password she sees that there are less than 10 seats available, so she makes a single reservation. Afterwards she logs out from her account and looks at the weather forecast for tomorrow and walks away.

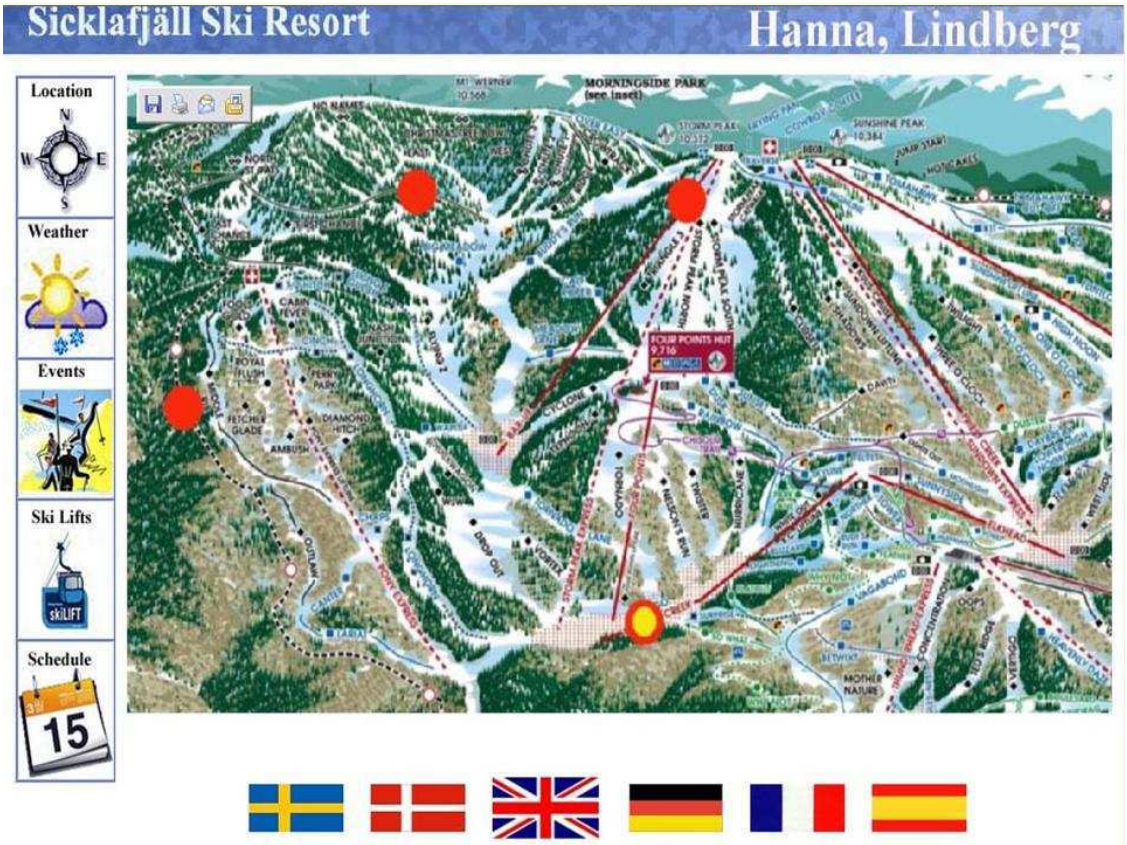
FAQ

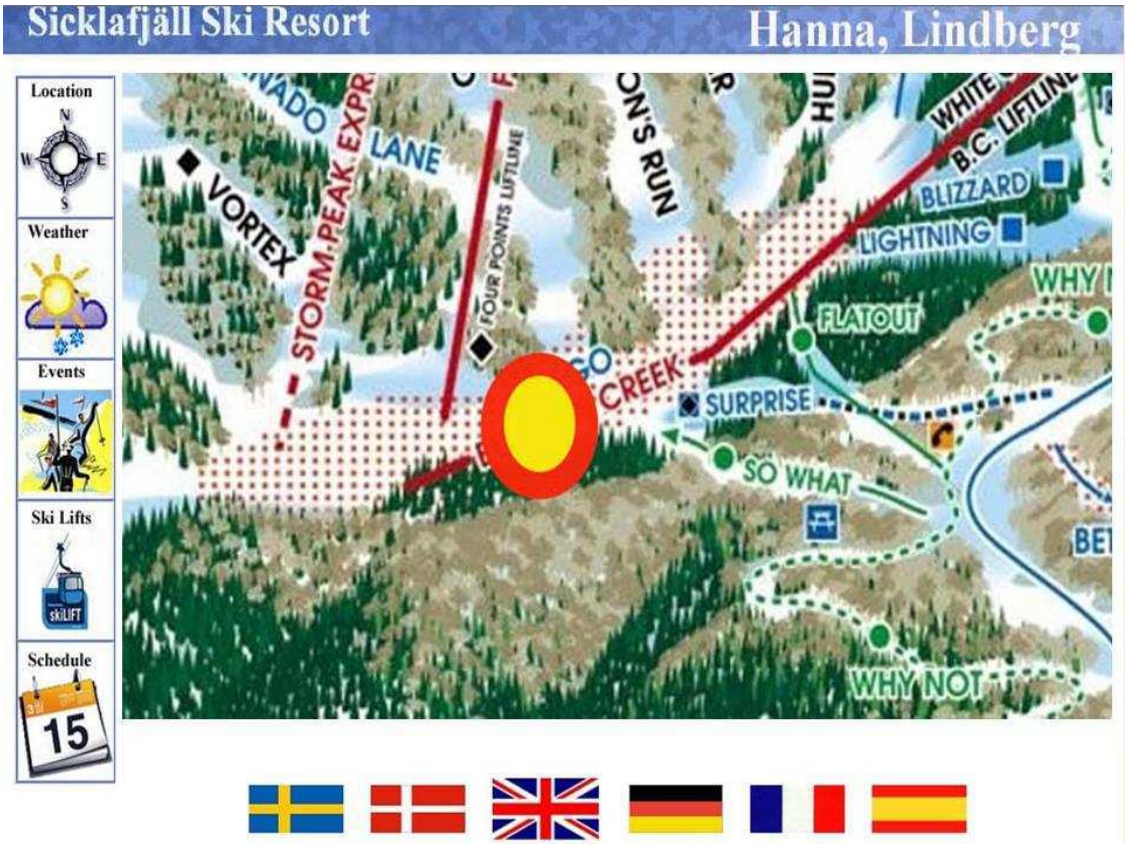
- Feedback & Questions


INF661 Interactive design seminar 2
Outdoor Sports
Group 1
Information Terminal

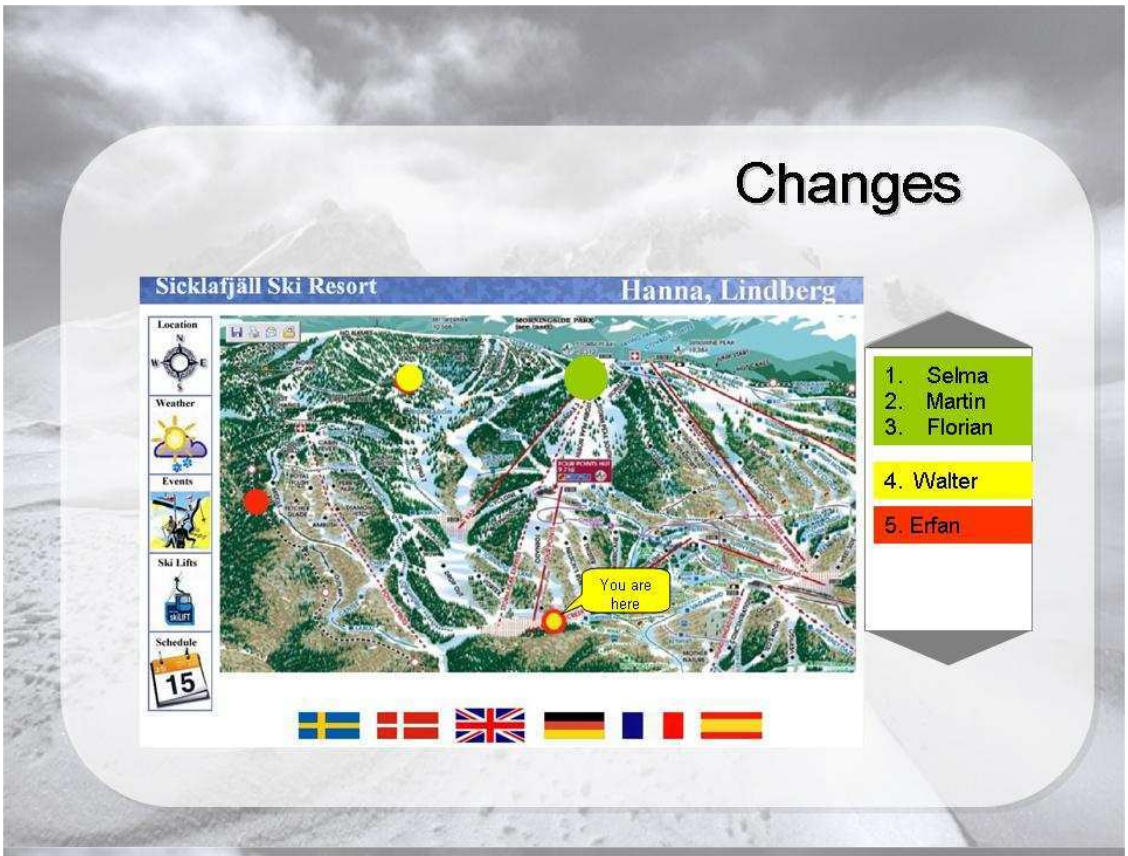

Terminal Interface
Sicklafjäll Ski Resort
Hanna, Lindberg
Welcome Hanna!
Touch the symbols to the left
to select your choice.
We wish you a nice day!
Location
Weather
Events
Ski Lifts
Schedule
15
Sicklafjäll Ski Resort
Hanna, Lindberg
Location
Weather
Events
Ski Lifts
Schedule
15


Sicklafjäll Ski Resort
Hanna, Lindberg
Location
Weather
Events
Ski Lifts
Schedule
Units:
Metric
Imperial
Tue morn-ing
Tue after-noon
Tue night
Wed morn-ing
Wed after-noon
Wed night
Thu morn-ing
Thu after-noon
Thu night
Wind
10 km/h
15 km/h
Outlook
clear
some clouds
light rain
cloudy
Snow (cm)
Rain (mm)
Min. Temp (C)
Max. Temp (C)
Wind Chill (C)
Freezing Level (m)
Sunrise
Sunset

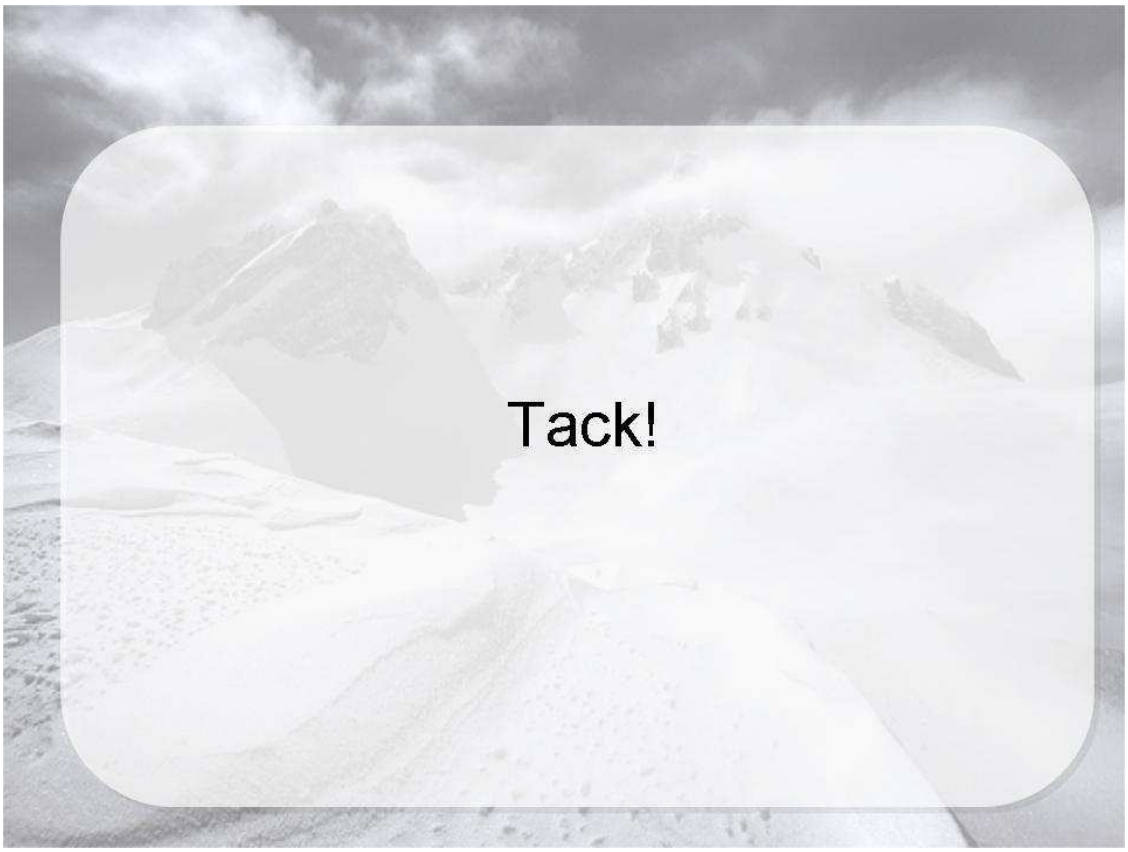

Sicklafjäll Ski Resort
Hanna, Lindberg
Location
Weather
Events
Ski Lifts
Schedule
MORNINGSIDE PARK
(see inset)


Sicklafjäll Ski Resort
Hanna, Lindberg
Location
Weather
Events
Ski Lifts
Schedule
15
VORTEX
STORM-PEAK-EXPR
LANE
FOUR POINTS LIFTLINE
CREEK
SURPRISE
SO WHAT
FLATOUT
BLIZZARD
LIGHTNING
WHITE
B.C. LIFTLINE
WHY NOT


Design Process
Sketches
Prototyp
Welcome Hanna!
Touch the symbols to the left to select your choice.
We wish you a nice day!


Changes
Sicklafjäll Ski Resort
Hanna, Lindberg
Location
Weather
Events
Ski Lifts
Schedule
15
You are here
1. Selma
2. Martin
3. Florian
4. Walter
5. Erfan


Zoom
Sicklafjäll Ski Resort
Hanna, Lindberg
Location
Weather
Events
Ski Lifts
Schedule
15
STORM PEAK 10,372'
FRYING PAN
COWBOY COFFEE
SUNSHINE 10,384'
TRAVERSE
OVER EASY
CROWTRACK
CHUTE 2
CHUTE 1
THE RIDGE
BUDDY'S RUN
TRIANGLE 3
STORM PEAK NORTH
STORM PEAK SOUTH
STORM PEAK CATWALK
HIGHLINE
CALF ROPER
1. Selma
2. Martin
3. Florian


Tack!

Group 1

The Evaluation Report

HCI – Analysis INF661

Selma Muminovic (811120),Martin Aichholz (801220),Florian Langmann (830111),
Erfan Tavoosi (820303), Hanna Lindberg (790413), Walter Kreis (820701)

[2006]

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Introduction

A fundamental part of the process when designing interfaces is evaluation. There are fairly different techniques of how to evaluate and in this report we are going through three of the techniques which we applied in practical exercises. Our assignment was based on evaluating the usability of three interactive products. We used suggested techniques for evaluating each product. These techniques are:

- **Video analysis**
  Collecting data by recording the test user when he/she is testing one of the programs in the MS Office package. Evaluating, analysing and finding usability problems.

- **Observation**
  Voluntary choosing one interactive machine and observing it in use by at least ten users and finding usability problems. We chose the ticket vending machine, provided by Skånetrafiken, at railway station in Sweden.

- **Heuristics**
  Using heuristics principles and evaluating FC (First Class). Finding problems considering these principles and finding the cause of why they occur.

Jakob Nielsen (2001) have developed principles for usability that are foremost used for evaluating prototypes and existing systems (Preece, 2002). The principles are formed with interface design in consideration and shouldn't be seen as specific guidelines.

As a starting point of our evaluation we have chosen to include these principles in order to gain more understanding of usability because we found them to be easily applied and followed in practice. These principles are:

• *Visibility of system status* - Always inform the users about what is happening, (feedback).

• *Match between system and the real world* - Speak the user's language with understandable words and phrases.

• *User control and freedom* - Offer possibility for the users to be able to go back to the parts of the system that they recognize, (marked exits)

• *Consistency and standards* - Avoid text, functions and situations that can be misunderstood

• *Error prevention* - If possible prevent possibility for user to make an error.

• *Recognition rather than recall* - Make options possible with visible functions and objects.

• *Flexibility and efficiency of use* - Action should be provided whit shortcuts for experienced users but invisible for beginners.

• *Aesthetic and minimalist design* - Avoid irrelevant information.

• *Help users recognize, diagnose, and recover from errors* - Help the users by allowing them to return from error by easy language of solution.

• *Help and documentation* - Allow the users to search for information that helps them solve a problem.

1. Video analysis (usability testing)

The usability evaluation was made on the program Word, due to the test user's choice, in the MS office package and our test user was a male student in his twenties. It is important to look at the test user's characteristics for the usability testing result since these characteristics can be predictors of how easy or difficult a product is to use for that person (Jordan, 1998). A product that is usable for one person might not be usable for another.

1.1. The test user

Our test user is in the present studying system science on the university. He uses his computer for a lot of things but mainly surfing and writing and since he has the same operation system and office package on his personal computer as on the test computer he can not be considered as beginner on using the test program.

1.1.1. Experience and Domain knowledge

The test user had previous experience with the test product but mainly from writing smaller reports. He had very little or no experience with other tools in the word processing program. As the test user had the test product at home and used it for his writing, it is unlikely that he had the knowledge relating to the tasks he was asked to perform from other products. So for that reason we draw the conclusion that he has a little domain knowledge.

1.1.2. Age and gender

The test user was a male in his twenties and had likely grown up with a high exposure to computers since he had about ten years of experience of computers. Therefore he would probably be accepting computer-based products and not being afraid of testing them.

1.2. Data analysis

The first problem that occurred during the test was the difficulties the test user had when it came to understanding the test questions and tasks that he was suppose to do. We choose to eliminate this problem from the clusters due to the fact that it had nothing to do with the usability of the software. The tasks were common tasks performed in a word processing program.

We found the following problems in our evaluation:

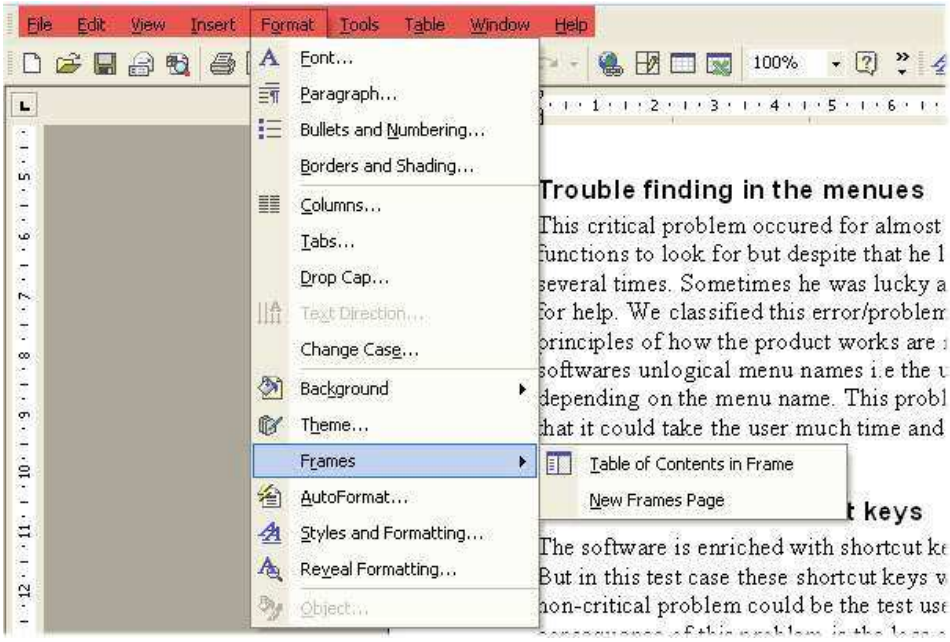
	Problem
Critical	Trouble in finding the right functions Trouble finding in the menus
Non-critical	Deficient use of shortcut keys Deficient use of shortcut buttons in the toolbar

With consideration to the principles of Nielsen (2001) we could draw the conclusion that the usability problems of the Word program could be within the following principles:

- “Match between system and the real world”
- “Consistency and standards”
- “Aesthetic and minimalist design”
- “Help and documentation”

1.2.1. Trouble in finding the right functions

This critical problem occurred when the test user for example should use the function to change the headline from italic to bold. He tried to find the function in the menus, which he failed because he didn’t know which function he was looking for. We classified this error/problem as a slip that occurred because of the interface to the product is inadequately designed. The cause of this could be the test users lack of knowledge about this function and the software wasn’t enough intuitive to compensate that. This problem is a fatal error because of its consequence, i.e. that it could prevent the user from solving the task.



The Menu is (red) is not intuitively enough to know where to find a function. Further, it’s very complicated to get help from “Help” – function. The program doesn’t allow the users to search for information that helps them solve a problem easily.

1.2.2. Trouble finding in the menues

This critical problem occurred for almost every one of the test tasks. The user knew what functions to look for but despite that he looked through different menus for the right functions several times. Sometimes he was lucky and got the right menu but other times he had to ask for help. We classified this error/problem as a mistake that occurred because the underlying principles of how the product works are not intuitive. The cause of this problem could be the software’s analogical menu names i.e. the user expects the function to be in a certain menu

depending on the menu name. This problem is a major error because of its consequence, i.e. that it could take the user much time and annoyance but it is not completely unsolvable.

1.2.3. Deficient use of shortcut keys

The software is enriched with shortcut keys to make it easier for the user to use the program. But in this test case these shortcut keys were only used for copy and paste. The cause of this non-critical problem could be the test user's lack of knowledge to this enrichment. The consequence of this problem is the loss of time and that the user gets interrupted in his work because he has to, for example, stop writing to use the mouse.

1.3. Test outcome

The test has made us question the test programs "user-friendliness" for first time usage. This is because of the test user failure to several tasks. When we look at where the product is used and by whom, our test user is among the category of potential users. But the fact that he had trouble finding the right functions and looking in the right menus searching for functions affects both the effectiveness and the efficiency of the program.

The comfort that the user felt when using the product also sank when he couldn't solve the tasks. As Jordan (1998) claims is the satisfaction the most important aspect of usability for products that are going to be used voluntary, such as the test program.

But to the test programs advantage we think the learnability is high due to the fact that the test user had picked up some functions provided by the program, for example did he know how to copy and paste right away. To test the learnability of the program further it would be interesting to do the same test again on the same test user and see how much information he picked up during the test and how much he remembers.

1.4. Our remarks to the usability test

There are a few factors that could have affected the outcome of this test. First is the fact that the test user was, according to him self, bad at English. The instructions to the test task were given to the test user in Swedish but the test program was in English. This could have caused him to be a bit confused over certain terms in the program and therefore made him unable to find the right functions.

Another thing is the fact that we were six people standing around observing him during the test and on top of everything he was videotaped. This might have caused him to get nervous and insecure which in return affected the test and made it harder for him to think the test tasks through. Due to this he could have had a harder time finding the right functions in the program.

The last, but certainly not the least, factor was the guidance given by us, the test conductors. In some cases we provided the test user with help too quickly not giving him enough time to solve his tasks. Because of this we might have missed important usability factors to evaluate when it comes to the user solving problems in the program.

2. Observation

The second exercise which was based on choosing some kind of interaction product and observing it while people were using it was a very interesting and an instructive task. It gave us a huge opportunity to really go into details and analyze everyday problems that occur with the chosen product and give a thought about why they occur in the first place.

We chose to go to the railway station in both Lund and Malmö to observe the difficulties that people were facing when they were interacting with the ticket vending machines. We wanted to see how both young and elderly people react to these machines when they want to buy the desired ticket.

2.1. Data Collection

The main two techniques that we chose to carry out the task were 1) using an audio camera to record (tape in) the interactions and 2) afterwards questioning the users about the problems they had and taking notes. The reason to why we have chosen these two ways is because we thought that it would be a good combination of informationcollecting technique.

We divided ourselves into two groups, where one observed in Malmö early on the morning and the other observed in Lund late afternoon. One of us in these groups handled the recording of the interactions while the remaining two took care of the questions and notes.

Our purpose was to see how users interact with the ticket vending machines in different environments and at different times during the day. We found these factors to be very important since users (travellers) may interact with a machine very differently under different circumstances, for example if they are in the hurry and/or stressed. Our observation consisted of 27 people**,** both men and women between the ages 20 to 50.

We decided to talk with the users to understand a little bit better of how they felt and were feeling about the design of the interface and what they thought could be improved. The reason that we wanted to complete the questions and the answers with recording was because we also wanted to have their reactions and behaviour so that we could go back and draw conclusions easier.

2.2. Data Analysis

What we generally could say about the outcome of our observation is that we have noticed big differences of how different experienced users understand how the ticket vending machines work and how these must be handled. We think that this will have a large influence on the future use and development success of these machines.

We found the following problems in our evaluation:

	Problem	***No. of users***
Critical	Problem in realizing the statuses of the machines	9
	Trouble with loading the card	5
	Trouble paying with banknotes	6
Non-critical	People had trouble finding the right destination	8

With consideration to the principles of Nielsen (2001) we could draw the conclusion that the usability problems of these machines could be related to the following principles:

- Visibility of system status
- Consistency and standards
- Recognition rather than recall

2.2.1. Problem in realizing the statuses of the machines

What is worth mentioning is that in Malmö there were two machines out of four which were out of order. What that was more interesting was that both experienced and highly experienced users had a hard time discovering this. They thought that the information about the disfunctionality was not clear and visible enough to understand it. This is one of the reasons that lead us to the conclusion that the interface of the machine is badly designed. Other reason is the first impression that many of the first-time users got by just looking at the machine. We asked some of those (most of them were elderly people) who approached the machines and wanted to use it but just walked away for a reason why they didn't use it. Most of the answers were: "it looks too complicated". But some of those who did use the machine for the first time were actually surprised of how really easy it was to use.

2.2.2. Trouble with loading the card

A principle that Jordan P. (1998) mention in his article is something he calls "Consistency". This principle means that the design of a product should be so clear and fresh that it is easy for an inexperienced user to generalize from his previous experience with that product and complete a whole new task with it.

During our observation we found that those users who had some experience had trouble completing a different task than the one they were used to, i.e. buying ticket. For example when they wanted to load their card their confusion and irritation increased. Many of them thought that the machine was out of function. Those on the other hand who had more experience had no trouble at all. Because of this reason we came to this conclusion that the machine doesn't have good consistency and is also poorly designed for its purpose.

2.2.3. Trouble paying with banknotes

Another big problem seemed to be that most of the users had problem with paying with their banknotes. This is a huge problem since it can cause irritation for the users and result in that they might stop using the machines in the future when they want to buy their tickets and go for other alternatives, for example buying the tickets from the ticket seller in the train.

A little smaller problem was that most of the users couldn't realize directly what they had to choose among all the different kinds of travelling options that existed on the menu to get their desired ticket. For some it could take up to several minutes to finally understand what to choose. The reason of this could be that the user interface isn't very logically designed.



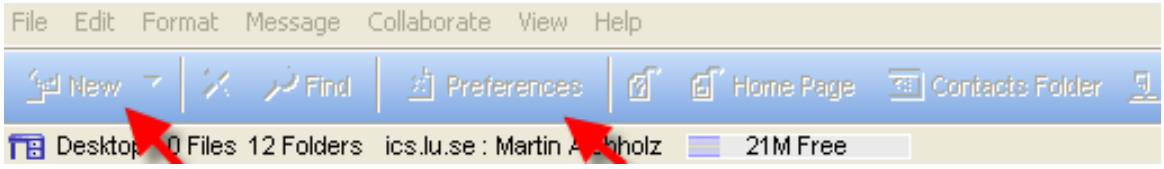
The ticket vending machine example.

3. Heuristics

In this exercise we have followed the heuristic guidelines that we received from our course teacher. From these guidelines we have evaluated the Firs Class conference system used in school.

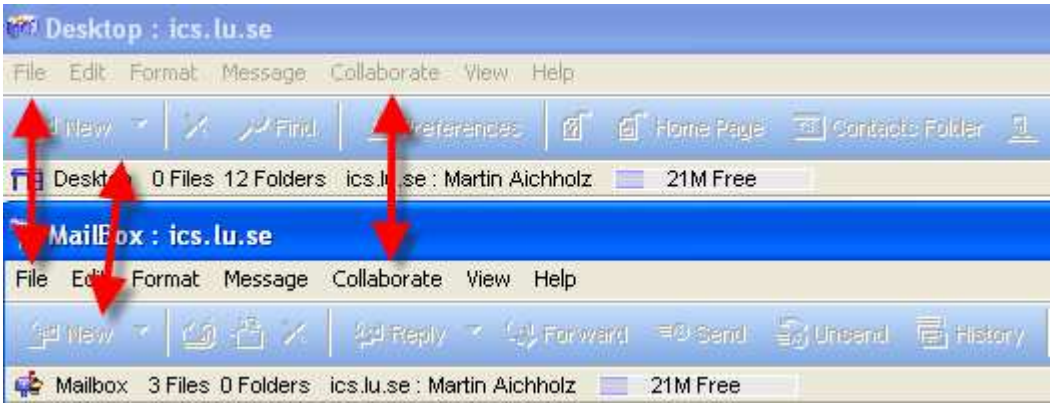
1. Simple and natural dialogue?

The FC uses key words in the menu structure also in all of it´s toolbars, so the user hasn´t to search for the key features as indicated trough the arrows.



2. Be Consistent?

The Toolbar buttons are in placed in the same order and it´s also divided in specific categories.
The arrows show the similar menu functions and buttons at Desktop and Mailbox.

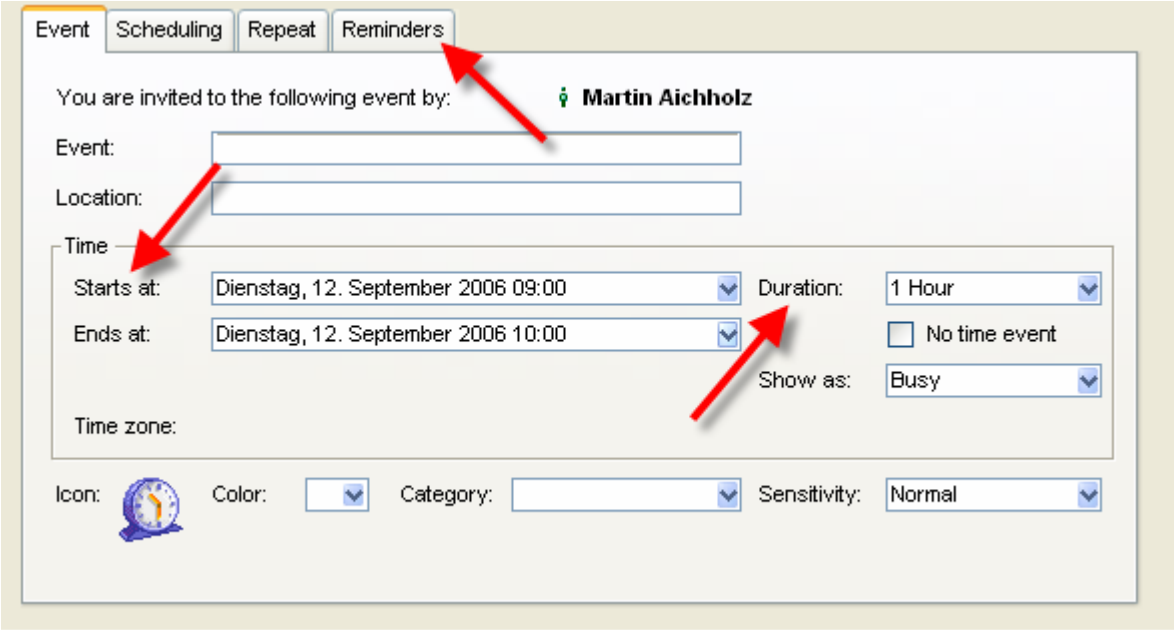


3. Provide shortcuts?

The most import and most used functions are placed on the toolbar. The functions are marked with the red arrows.

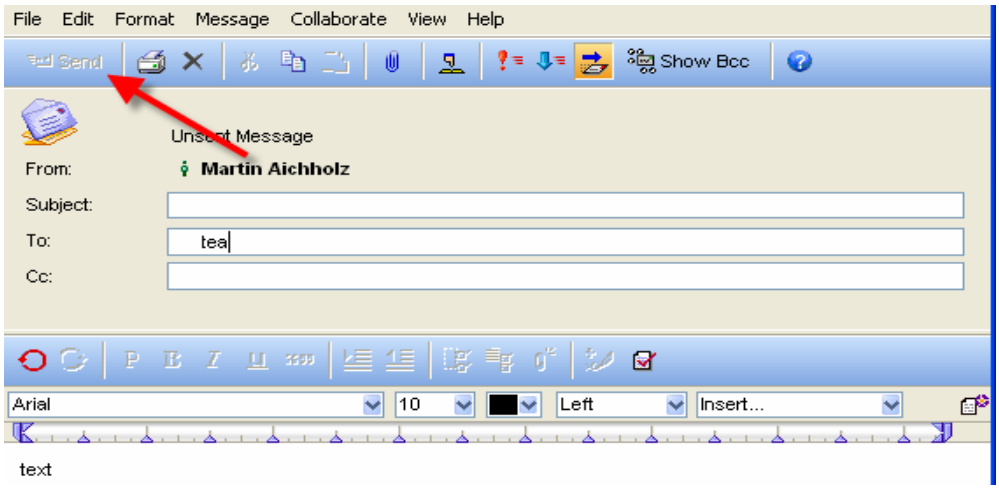
4. Use the user's language?

The Language which is used in the FC is easy and it´s also concise. The arrows pointing at easy understandable phrases.



5. Prevent errors and Deal with errors in positive and helpful manner?

The FC provides the users to prevent failures by deactivating buttons which function would lead to an error. As shown in the picture below the users is not able to send an e-mail when he/she types incorrect address format.



3.1. The Problemlist

Critical:

- When the user wants to make a new an event (calendar, mailbox, etc.) he/she is not able to leave the window without creating a new event, so he/she has to delete it afterwards
- You are not able to interrupt an upload so you have to upload files from the beginning
- The confirm button (delete, cancel) after deletion an object are placed in wrong order
- The user is not allowed to delete mails, files and folders finally
  -> Deleted files can be restored
- The default value for the time in the “New Event” - Window also accept times which are in the past, without giving information that the event lies in the past

Non – Critical:

- There’s no feedback after a mail was sent
- You will leave the whole FC program if you don’t know the difference between the close and the exit function
- The system doesn´t make an automatic undo of uncompleted files when the user cancel the upload
- There’s no specified help for the submenu that you are in, but you can open the help guide wherever you are

3.2. The three important problems

Creating new Objects

The Problem

We found one big problem when we tried to create some new objects like “New Event “inside the calendar, “New Message” inside the Mailbox and also “New Contact” inside Address Book. The problem occurs when the user wants to cancel one of these procedures; the object is being created even if the user just closes the window by using one of close functions. That an object is being created even though the users choose to cancel the operation causes the user to be among others confused and frustrated.

1. Create New E-Mail

2. New message is created automatically in the mailbox

The Cause

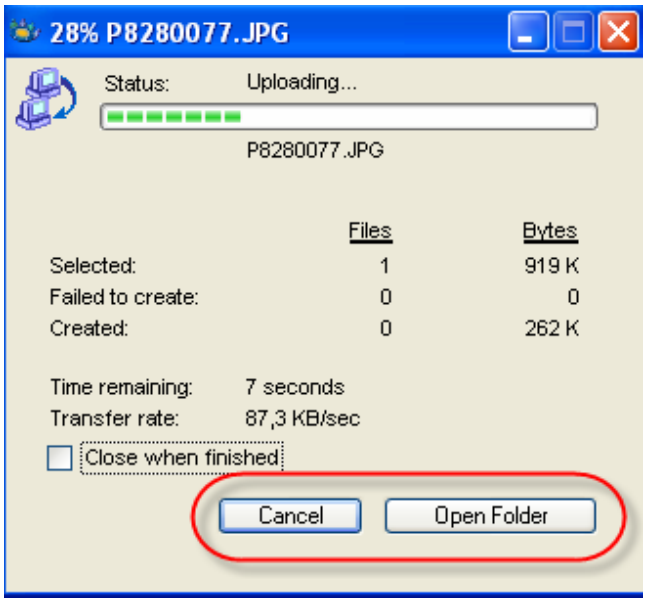
At first one we think that the reason of the problem lies behind the lack of design knowledge within the development in the beginning of the designing process. Also it´s possible that they didn´t have iterative usability evaluation during the product development life cycle.

If we look from the users point of view the problem is caused by acting intuitively, we think that the most users assume that the close operation implies an automatically undo function.

The Upload Function

The Problem

The user of the FC has the possibility to upload files but is not able to interrupt an upload and continue it later, so he/she has to upload the files again. The user can by this problem be fooled to think that the file is correctly downloaded since it is there.



No possibility to interrupt the upload

The Cause

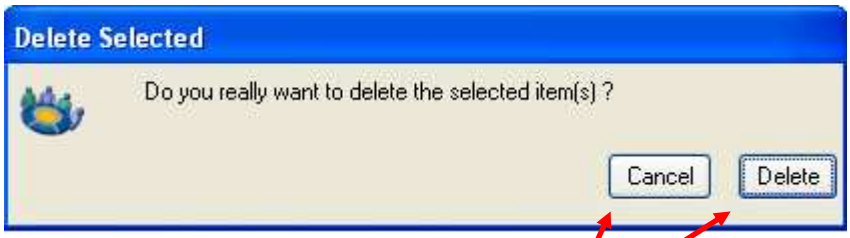
The FC gives you the opportunity to extend your space but the most users only require the default value of 25 MB of space. So the developer didn´t consider the more experienced users needs, for example teachers and course administrators, of uploading larger files.

Misleading Button Order (Delete and Cancel)

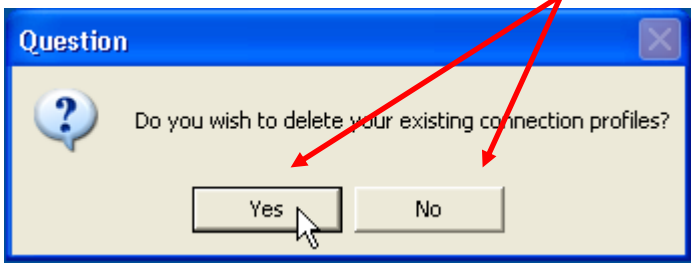
The Problem

The buttons “cancel “and “delete” are not in the order as usual for Windows user, thereby could it happen that the user automatically delete important objects. Domain knowledge that user possess can cause the user to push the wrong button and instead of canceling an operation delete important files.

FC confirmation

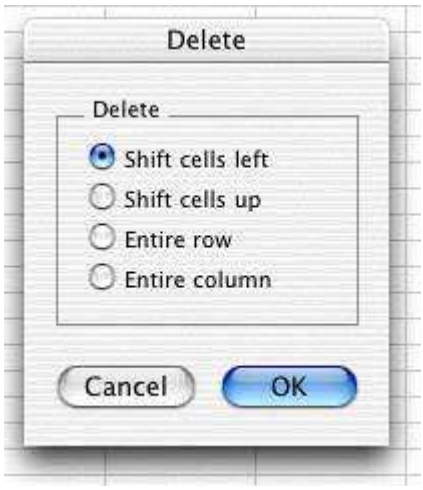


Windows confirmation



The Cause

After research we found out that the most MAC based systems are using this order. So the Developer contingent was MAC user as well and implicated his experiences in this system.



4. Conclusion

In our report we have only mentioned the principles that we found problematic for our test products in the first two exercises. The third exercise we used the given heuristic guidelines and found problems within those.

After evaluation and analysis of our datacollection we found following usability problems, which are associated with the principles of Nielsen (2001).

MS office – Word problems: “Consistency and standards”, “Error prevention”, “Aesthetic and minimalist design” and “Help and documentation”.

The ticket vending machines problems: “Visibility of system status”, “Consistency and standards” and “Recognition rather than recall”.

First Class (FC) problems: Problem creating new objects, problem with the uploading function problem and the misleading button order (delete and cancel).

5. Our remarks on the evaluation methods

Video analysis

In our exercise we tested usability with only one test user. This gives us a poorly ground for evaluating usability of the product because it is hard to generalize and draw conclusions about product usability. We think the outcome would have been better if you had several test users but this is most likely the fundamental thought with the video analysis method. Further the test environment was not natural for the test user due to the fact that he was among other things observed by six people who we think effected the test results. Our general view of this method is that it's a good way to collect qualitative data under the right conditions.

Observation

This method we find very fruitful by the means that you observe the interaction between the product and the users in their natural environment. If the method can be combined with talking to the users after the observation, we think the outcome can be more satisfying. One difficult thing when observing could be the conditions of the environment, for example the distance to the observing field. You don't want to get to close and interrupt the users but on the other hand you can't stand to far away because you may miss some important factors that affect the usability.

Heuristics

This method is more structured than the other two, due to the fact that you are given guidelines to follow. This sets focus to certain evaluation areas that are given to the conductor in advance. The down side to this is evaluation method is that the conductors get too focused on the guidelines and the risk is that some other factors in the usability test are missed. Since this method is foremost used by experts the risk of missing important factors are low.

Fall06

HCI-A

Design Project – Outdoor Sports

Human Computer Interaction: Analysis
Lund University
Informatics

Content

The Design Project

The intention with the interaction design project is to stimulate your learning process by giving hands-on experience in interaction design and evaluation together with real user representatives. You will work with an interaction design case called "Outdoor sports", which is presented below. Your group will select the intended approaches, methods and techniques for the design process at workshop 2 as part of the design project. The results from your project are presented in three stages:

- For seminar 1: a proof-of-concept, which might include personas, user scenarios together with paper-based storyboards and mock-ups. The concept should have been evaluated with someone outside the design team.
- For seminar 2: a prototype together with results from usability testing.
- Finally a design report is handed in after seminar 2. The report should include the project results, descriptions of your way dealing with the design problem, representations used as well as critical reflections regarding your method and your results with clear references to the course text.

You are recommended to store your work on our file server (LU-ICS) to let project supervisors review your work after the seminars.

Presentation for seminar 1: proof-of-concept

The result from the first part should be a *conceptual* design illustrating the main idea of the design concept, and should not include any solutions on detailed level, for instance detailed visual design. If the design team has several design concepts, the seminar could provide you with good feedback from the audience. The methods for designing and evaluating the

proof of concept should be carefully planned, motivated and documented to be included as a crucial part of the design report.

The design concept should be presented using suitable representation techniques discussed during lectures and workshops, like personas, usage scenarios connected to storyboards, paper-based mock-ups, function analysis etc (see for example Preece chapter 22). The concept should be evaluated by at least one person outside the design team to avoid group thinking and fixations, and the results from this evaluation should also be presented at the seminar.

Please note that the material for seminar 1 should be produced as quick-and-dirty as possible. This means for example that you could use hand-drawn sketches to keep the design process on a conceptual level, and that no programming should be involved at all.

At the seminar 1, you are expected to present your proof-of concept including overall conceptual design, information structure and functionality. This should be closely connected to the different user profiles you have identified, i.e. their needs and wishes regarding the design and functionality of the system. Prepare for about 15 minutes presentation.

Presentation for seminar 2: prototype and results from usability testing

The results from the second part of the design project should be a prototype that is tested with representatives (forms are provided in the design studio). The prototype should show the complete interface for some selected features in your concept presented at seminar 1. Remember that it is better to stick to a small number of features and prototype them well. In other words, it should be a vertical prototype rather than a horizontal one (see Preece chapter 27). You are recommended to build the prototype using the software provided in the design studio. The prototype should be evaluated with user representatives and concrete results from this user testing should be documented.

The methods for designing and evaluating the prototype should be carefully planned, motivated and documented to be included in the design report.

At the seminar, you are expected to show the part of the concept you have decided to focus on, to present the results from the user testing as well as proposed changes in your design, considering the user evaluation results. Also, a brief presentation of the methods and techniques used is relevant.

Design report

A design report of 4000-5000 words should be handed in after the seminar (See the schedule for date). The report should be delivered as an attachment to an email to the examinator, and make sure to name the attachment this course code as well as your group

number, the exerices and date, e.g. <inf661-group4-evalation-020130.pdf>. The report should include the following:

- *Brief description of proof-of-concept*, including a description of the intended user profiles.
- *Interface description*. Snapshots from the prototype interface together with brief explanations of how it works.
- *User evaluations*. Explain how you carried out the user evaluation activities, why you have chosen certain evaluation techniques, what the results were and briefly what changes you propose to your current design. Your reflections regarding the methodological success are also relevant.
- Presentation and reflection of your *choice of methods and techniques*.
- *Arguments for your solution and reflection on findings*. This part is the most significant for the grading, explaining how you have reached your solution, including design decisions, compromises you have made, etc along the way. You should also reflect on your findings in the exercises, using the course textbook (Preece et al, 1994) and the articles. Make comments on problems or solutions, or try to explain interface flaws. All the time you are encouraged to use the whole course text. You must have clear references to the course text to support your arguments (in the following form: "...and we came to the conclusion that the second alternative would provide significantly better perceptual affordance as described in Preece (1994, p 278)"). Your ability to discuss and reflect over HCI problems using HCI concepts in this part is most important for the grading. In other words, simply applying the heuristics from workshop 1 is not enough.

If properly documented, a lot of material from seminar 1 & 2 presentations could be re-used in the design report, so have the report in mind during the whole project.

Learning...

To learn something it is very important that you take an **active part** in the seminars. Remember that you really haven't learnt anything until you have put your knowledge to work in design activities and discussions about design.

Case study: "Outdoor Sports"

Introduction

The "Outdoor Sports" is a team of ski and experience guides located at Sicklafjäll in the northern part of Sweden. Outdoor sports is specialized in offering the resort's guests a "positive experience on snow" and basically they sell experiences to the guests, including ski and snowboard school, mountain guiding, day-tours of cross-country skiing, as well as

tailored conference arrangements for companies including the above but also pentathlon competitions. The guests are from all around the world, with a focus on Swedish and Danish families. Typical guests are families with one or many children ranging from 3 to 14 years, who often returns to the resort for the third of fourth time. About 35% of the guests are at their first visit to Sicklafjäll. Another important guest category is the corporate conferences, also managed by Outdoor Sports. Today there are 45 employees in the team serving the guests, age 18-35 years. Johan Joacimsson is the outdoor sports director and coordinator, and explains:

> "We think of ourselves as a small but modern, dynamic and ambitious company. Of course we offer the same activities as other resorts, but in addition we want our edge to be the best service you can get, adding value for the guest experience. We want to keep our guests coming back, and give them the personal treatment they don't get from other resorts, what we internally refers to as "SX" (an acronym for "Small Extras"). This is why we started to keep track of their preferences and background. Actually the idea came from a guest who asked us why we didn't know what she did last year, her favorite activities and who the ski instructor from last year was. Another thing about Outdoor Sports is that we are basically all equal members of a team. I am the manager and I do the paperwork, accounts and stuff, but I don't want to act as a boss. We've had great brainstorming sessions about this new activity booking system we are getting designed for us, and everybody takes part. I am absolutely confident that this is going to boost our business. Finally we are going to get a system that is designed to match the special needs we have for giving the guests the best service they can expect.
>
> We really need a new system as the old one has a lot of weaknesses. When it was built in 1984, our business was considerably smaller with only 10-15 employees. The problem is that it lacks a lot of functionality, which makes it hard for us to do a good work, resulting in poor guest service. The interviews with our staff will probably inform you with the needs from the different user categories. Some consultants we hired were talking about graphical interfaces and new technology like PDA's and mobile computers, different from our desktop computers and UNIX-based system, but I'm not really sure of what they meant. Most of our personnel work outdoors during the whole day, and one of our main problems is to keep them updated with changes in their day schedules. Of course we have the walkie-talkie radios, but only the group leaders carry radios regularly.
>
> We also need to provide our guests with the opportunity to make their own bookings before they arrive at Sicklafjäll. We were thinking about a separate website where the guests can book activities from their homes."

Below, you will find histories describing two guest meetings. The narratives are based on real-world observations and contextual inquiry at Sicklafjäll.

Meeting the guest

The Outdoor Sports meet their guests in different ways but the first contact is normally via phone. Most often, the guest has visited the web site and has some wishes, questions or ideas about what to do during their visit. The first history below describes a typical telephone conversation with a guest and the second describes the meeting between a ski instructor and a guest. Other ways of meeting the guest are face-to-face at the booking office and via e-mail.

Use these fictive narratives as a base for functional design and system services. Note that for seminar 1 you will have to come up with future scenarios, but shorter and not necessarily in dialogue form like this one.

History 1: phone conversation at the booking office

Lotta at the activity booking office takes a call from a guest, Helena Karlsson from Hässleholm in the Southern part of Sweden.

Lotta:	– Welcome to Sicklafjäll Outdoor Sports, this is Lotta.
Helena:	– My name is Helena Karlsson.
Lotta:	– Hi Helena, what can I help you with?
Helena:	– We are visiting Sicklafjäll during the Easter holidays and would like to book some activities. We are arriving on Saturday and we will stay for a week.
Lotta:	– OK, I'm sure I can help you with that, what exactly do you have in mind?
Helena:	– Well... er… We have two children, Zeke and Ellen, that we would like to put in ski school, and I think I need some updates regarding my ski technique as well. But I don't think I want to spend the whole week in the ski school…
Lotta:	– Then I can offer private lessons for you. You book a ski instructor for as long as you wish, two hours might be just right to get you back on track, and you can choose whatever you want him or her to focus on. I have an available instructor at… [pause] …1.10 PM.
Helena:	– That sounds perfect, I think I book two hours on Monday then. By the way, I have always wanted to try snowboard…is it possible to book one hour snowboard school, perhaps on Wednesday?
Lotta:	– Of course…hang on a second and I'll check for some available snowboard instructors… [20 sec pause] … all right, Wednesday at 9.10 AM, is that OK?
Helena:	– Perfect.
Lotta:	– And the children, how much experience do they have?
Helena:	– Well, Zeke is just 4 years old and has no prior experience. He has Down's syndrome and can sometimes be quite temperamental. Also, he is not good at taking verbal instructions but can learn by imitating other children. So I would like a very experienced instructor for him, if possible.

Lotta: – OK, I understand. I'll book you with Fredrik Persson who has a lot of experience working with handicapped, most often it will work out just fine. What about Ellen?

Helena: – She is 12, started two years ago and can now go in blue slopes by herself.

Lotta: – So she has no problem stopping and turning…has she learnt to keep her skis parallel?

Helena: – Yes, in the green ones, but in blue and red slopes she still uses the plow. But she is not afraid at all…

Lotta: – OK, I'll book her into a blue group of children, aging from 10 to 12 years at 10.40 AM, Monday to Friday. Is that OK?

Helena: – Yes, very good. What times do you have available for Zeke's ski school?

Lotta: – For Zeke it is 9.20 in the morning. The meeting place is in the beginners' area…and for Ellen it is at the meeting point for intermediate pupils, just by the booking office.

Helena: – OK, suits me just fine.

Lotta: – Then I'll summarize for you. I have booked you for a two-hour private lesson at 1.10 PM on Monday, and a snowboard private lesson at Wednesday 9.10 AM. The children are booked for group lessons, Zeke starting on Monday 9.20 AM and Ellen on Monday 10.40 AM. The private lessons are 535 crowns each and the group lessons are 670 crowns for a week…that makes… [pause – calculates the sum] 2945 crowns total. This will also give you 295 bonus points, which you can use next year for activities or in the sport shop.

Helena: – That sounds nice, how do I pay?

Lotta: – You can come in and pay at the booking office, or I can send you a pay form together with the remainder of times and places.

Helena: – Is there a possibility to pay on your web site?

Lotta: – No, unfortunately not…but we are working on it.

Helena: – All right, then I choose to come in and pay when we arrive.

Lotta: – Very good. Well…any other questions?

Helena: – No, I don't think so…what about the weather conditions?

Lotta: – Right now we have about a meter of snow and the sun is shining most of the time. The snow condition is excellent and the avalanche risk is 3 on a scale from 1 to 5.

Helena: – OK, sounds just perfect. Thank you so very much.

Lotta: – Thank you and I wish you a pleasant vacation.

[Lotta hangs up and walks up to the counter. Some guests just arrived at the office and are waiting to be served.]

History 2: meeting between a ski instructor and a guest

[Fredrik Persson just left the morning meeting. He keeps his day schedule in his pocket and just realized that he forgot his pencil and, which is worse, his goggles in the changing room. The weather today is windy, 9 degrees (Celsius) cold with small, hard snowflakes in the air. He has no time to return to the changing room; it is 9.02 AM and he is expected to be at the meeting point for private lessons at least five minutes before the lesson starts. Within three minutes he needs to pick up his skis in the ski storehouse, walk to the meeting point and change to ski boots.]

[Fortunately, nothing fails and 9.06 he is waiting at the meeting point. Looking in his schedule, he sees that his first lesson is not paid and therefore there could be some changes to the schedule. At 9.14 a middle-aged woman shows up, obviously a bit confused, looking for a ski instructor.]

Fredrik: – Hello, are you looking for an instructor?

Woman: – Yes. I just visited the booking office, and they booked me on a guy named Fredrik. Is that you? My name is Gunilla Hansson.

Fredrik: – Yes that's me. Welcome to the Outdoor Sports ski school.

[They shake hands and Gunilla shows her receipt. Fredrik gets the information he needs, indicating that his first guest cancelled the lesson, and that he is skiing with Gunilla instead. Otherwise he could not be sure that his original booking from the day schedule was cancelled, since the guests have the possibility to pay in arrears. He really hates these occasions when there in an uncertainty about which instructor who is going with a guest, and it is also common that people show up, trying to get a lesson for free claiming that they are booked. Only the group leaders have a radio so he cannot contact the booking office and ask them. The minutes are expensive, so he chooses not to double-check as it would delay the lesson further.]

Gunilla: – Thank you very much, sorry I'm late.

Fredrik: – It's OK of course. So Gunilla, what did you have in mind when you booked a private lesson?

Gunilla: – First of all, I wonder if my poles are too long.

Fredrik: [checking the length of the poles] – No, they seem OK, do you feel that they are too long?

Gunilla: – No, it was just my husband that….well never mind. My main issue here is to learn mogul slope technique. I tried it yesterday, but it failed completely… [laugh].

Fredrik: – Errm…let's give it a try, Gunilla. We have one hour, according to my schedule and in that time I can give you the basics.

Gunilla: – …then it's up to me, right [giggling].

Fredrik: – Right…are your ski boot comfortable, and the skis work fine? [Fredrik notices that Gunilla has old, straight skis and normally he would provide

modern carving skis to the guest but for a mogul lesson, these will do just fine.]

Gunilla: – Yes, they are OK. I actually bought the boots here last year, recommended by you.

Fredrik: [realizing that he obviously was instructor for Gunilla last year.] – Aah, wait a minute, I was just thinking that we actually *did* meet before, was it last year?

Gunilla: – You recognize me now? Yep, I was I a black group with three other women last year, and the whole week was awesome. That's why we are coming back to you.

Fredrik: – Nice to hear. My plan for this hour is that we take the plate lift to the north slopes, where we have our easy mogul for beginners.

Gunilla: – Sounds perfect to me. Let's go.

Fredrik: – Yes, off we go.

[After an hour, though five minutes late, Fredrik and Gunilla returns to the meeting point. They shortly discuss the progress in Gunilla's technique. She is satisfied with the lesson and decides to go to the booking office and book another lesson later in the week.]

Some user opinions

Here, short excerpts from interview transcripts with intended users are presented. The booking office staff, the ski instructors[1] and the conference personnel presents a view of their daily work and their needs.

Ditte, 24

"Our days are busy. We start at 7.15 AM to print out the day schedules. The morning meeting is at 8.40, so the lists must be ready and as accurate as possible by then. Quite often there are alterations to the schedules right after the meeting, due to sick leave, missed vacations and so on, but we do not make the corrections until Monday evening. The office opens at 9.00, and by then we must be back at the office. Most of the days are spent answering the phone, serving customers by the counter and communicating with the staff via radio. On Monday evening we have a group meeting where the ski instructors discuss the group participants and make changes due to cancellations and too heterogeneous groups. Quite often the guest's own appraisal of the ski skill does not match reality, so to speak. As a result of the Monday meeting, the changes in the day schedules are often many.

The big issue in our work is to put the guest into a suitable group, to notice and satisfy special wishes and requests and to keep the staff working outdoors informed about changes to their work plan. The current system is old, lacks some functionality for giving "SX" and is awfully boring."

[1] 'Ski' instructors include the snowboard, telemark (free-heel skiing), cross-country and handicap instructors.

Johan, 26

"I work as a ski instructor for children. We work in the children's and beginner's area and I spend most of my day there, from 9.20 AM to 4 PM. I usually bring a lunch box to the changing room and eat together with the others, though some days I eat at the restaurant. The list over children I get on the meeting is often incomplete, and I need to contact the booking office several times a day to clear out misunderstandings. Unfortunately we have only one radio, so quite often I have to let children not on my list join the group, even if it is full booked. The worst thing is when children disappear. Sometimes I do not find them during the lecture, and hence the parents get really upset, which is understandable. Most of the times the child has joined another group, so it is no big deal. But the uncertainty is the worst thing."

Sara, 32

"I mostly teach private lessons for one hour or more. After the morning meeting I fetch my skis and walk to the private ski school cabin. There I keep my helmet, ski boots, spare gloves and my lunch coupons for the restaurant. We have a radio in the cabin, so I can contact the booking office and ask for changes in the schedule but too often they are busy at the office and can not answer my calls. Actually the private ski school instructors are quite isolated from the rest of the group; we spend our days in the cabin, often eat at the restaurant with our guests and arrive late to the Monday meeting, due to different work times. Our work with private lessons are demanding since the guest pay a lot of money for one hour and really wants return-of-investment, so to speak. But I really love my work."

David, 28

"We are five people working with special activity arrangements and conferences, and I am the team leader. We are trained ski instructors but mostly work with pentathlon, triathlon or giant slalom competitions. There is archery, paragliding, snow cat races, building snow bars and other things on our program, but the wishes from the guest are very varying and we have to be flexible. We had a discussion with Johan (Joacimsson) the other day and we expressed that our work is very different from the others and that we really do not feel that we are part of the team, since we are often 'forgotten'. A lot of time is spent on fixing practical stuff; ordering mullet wine from the restaurant, preparing the snowboard half pipe and rigging the sound system. I think all of us would like to spend more time working in the ski school than we currently do."

Johan Joacimsson comments: "Of course there are other system stakeholders (potential users) than the ones you interviewed, e.g. the ski lift staff, the sport shop personnel, the mountain rescue & snowmobile patrol and the children caretakers/baby-sitters. They are maybe not primary users of an activity booking system, but they are colleagues who help us with lots of things and maybe they should be considered as users, too."

Snapshots from the current system

Here are some screens from the old UNIX-based system. In the "Day view" screen, activities are booked for the Outdoor Sports staff.

```
         System ver 7.8   Day view – F Persson                        8/56


         Name:            F Persson              Date:    4/13/2002

1        Time:            09.20–10.40
         Guest:           Group
         Age:             Adults
         Activity:        Snowboard green
         Participants:    5/10
         Info:            3 days Mo-Thu
         Paid:            Yes

2        Time:            10.50-12.10
         Guest:           Preben Hansen
         Age:             Youth
         Activity:        Ski blue
         Participants:    1/1
         Info:            5 days
         Paid:            No

3        Time:            13.10-14.30
         Guest:           Group
         Age:             10-12
         Activity:        Ski red
         Participants:    7/10
         Info:            4 days
         Paid:            Yes

4        Time:            14.40-16.00
         Guest:           OFF DUTY
         Age:             OFF DUTY
         Activity:        OFF DUTY
         Participants:    OFF DUTY
         Info:            OFF DUTY
         Paid:            OFF DUTY




         F1: Help         F2: New booking  F3: Previous   F4: Delete booking

         F5: Optional     F6: Optional     F12: SysRq
```

Figure 1: Activity booking system – Day View Screen.

In the list view, the instructors are listed. To book an activity, the booking staff chooses an instructor and presses F2 (Day view).

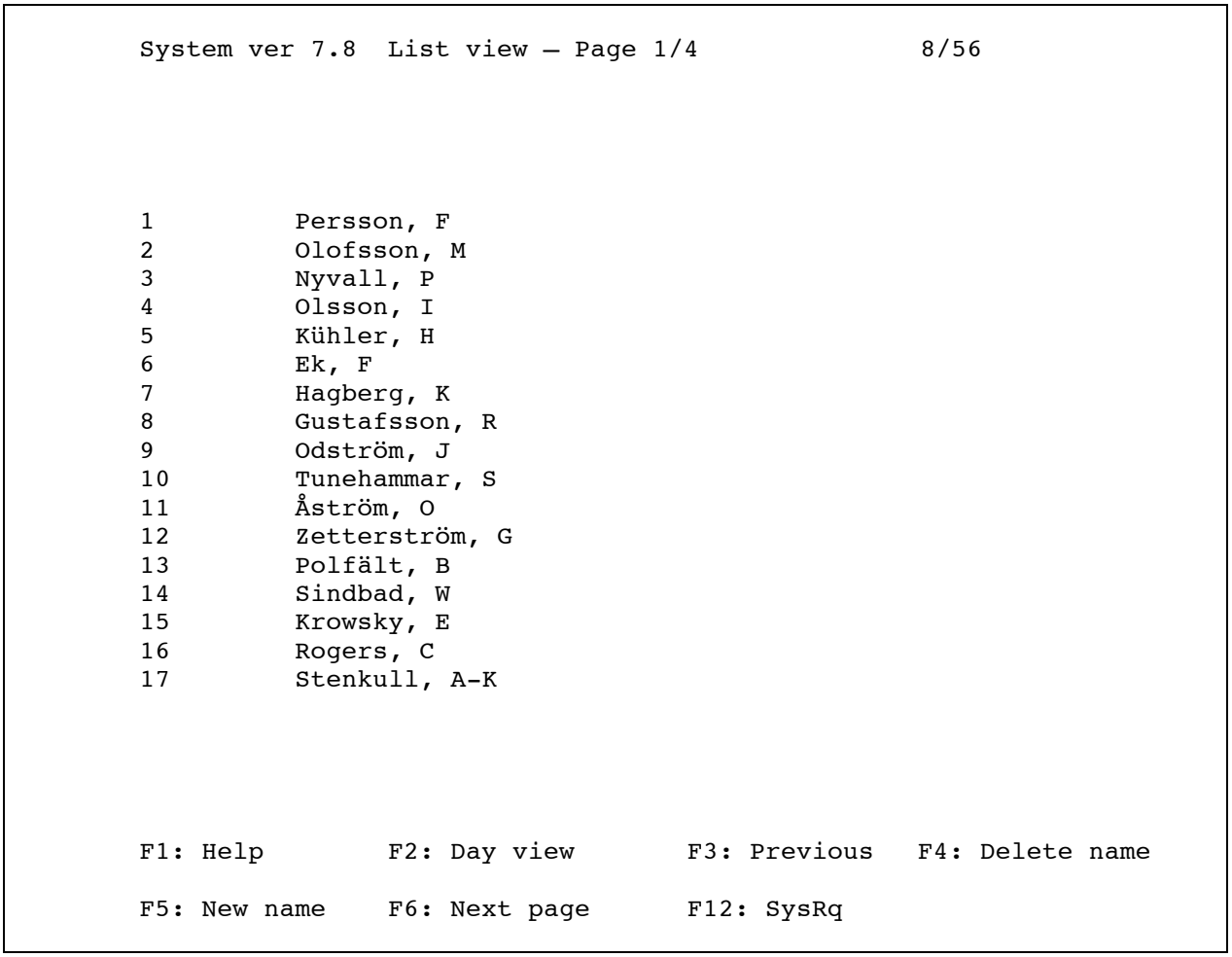


Figure 2: Activity booking system – List View Screen.

At the morning meeting, the list of activities is handed out to each employee. The booking staff simply presses "Print Screen" in the activity booking system, uses a scissors to remove unnecessary information and brings it to the meeting.

```
        Name:           F Persson              Date:    4/13/2002

1       Time:           09.20–10.40
        Guest:          Group
        Age:            Adults
        Activity:       Snowboard green
        Participants:   5/10
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        Paid:           Yes

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        Guest:          Preben Hansen
        Age:            Youth
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        Participants:   1/1
        Info:           5 days
        Paid:           No

3       Time:           13.10-14.30
        Guest:          Group
        Age:            10-12
        Activity:       Ski red
        Participants:   7/10
        Info:           4 days
        Paid:           Yes

4       Time:           14.40-16.00
        Guest:          OFF DUTY
        Age:            OFF DUTY
        Activity:       OFF DUTY
        Participants:   OFF DUTY
        Info:           OFF DUTY
        Paid:           OFF DUTY
```

Figure 3: Daily activities – Printout of Day View Screen.

The skill levels of the ski school participants are ranked in green (beginner), blue and red (intermediate 1 and 2) and black (advanced) categories. Both private and group lessons are booked here, group lessons with duration of 1 hour and 20 minutes and private lessons. Private lessons are booked from 1 hour (minimum) to a whole day. The maximum number of participants in a group lesson is 10, occasionally it can be overbooked with one or two people. For private lessons, one person or a group book one or many instructors and pay a fixed price per hour.

Your mission

As you may have guessed you are an excellent interaction designer in a consultant company and right now you have just gone through the first briefing sessions with the people at the Outdoor Sports department. These are the first rough ideas that they produced regarding the new activity booking system:

- The basic service is that we need to be able to easily book an activity for the guest. This includes, time, place, price, type of activity and who the instructor is. The displays of the current system are poor and to get an overview of the day and/or week is hard, both for the people working outdoors and for the booking staff.

- We want to have information about guest preferences and previous bookings on the screen at the right moments in the booking process. Also, wee need to get and provide information about disabilities or other special needs.

- There is a discount system for the guests. For every activity booked they accumulate points, and when they have reached a certain amount they can exchange their points for free activities like a free private telemark lesson, a hiking day at Kantvålen[2], new carving skis, free children care or a free swimming pool and sauna ticket. We need to inform our guests about their current number of bonus points and their alternatives to exchange them.

- We envision some sort of graphical interface because we think we can pick up some of the info quicker if it is visualized in graphics rather than just displaying text. We want to see some suggestions on this. One of the most important things is to get a quick overview of the bookings for a day or for the whole week.

- The booking staff is going to spend 8 hours a day looking on that screen. We want the interface to be smooth and sexy, not boring and stiff.

- The people working "in the field" needs accurate, updated information concerning their daily schedules, but if it's possible they might need other information regarding lift queues, closed lifts, weather conditions, accidents, lost children etc.

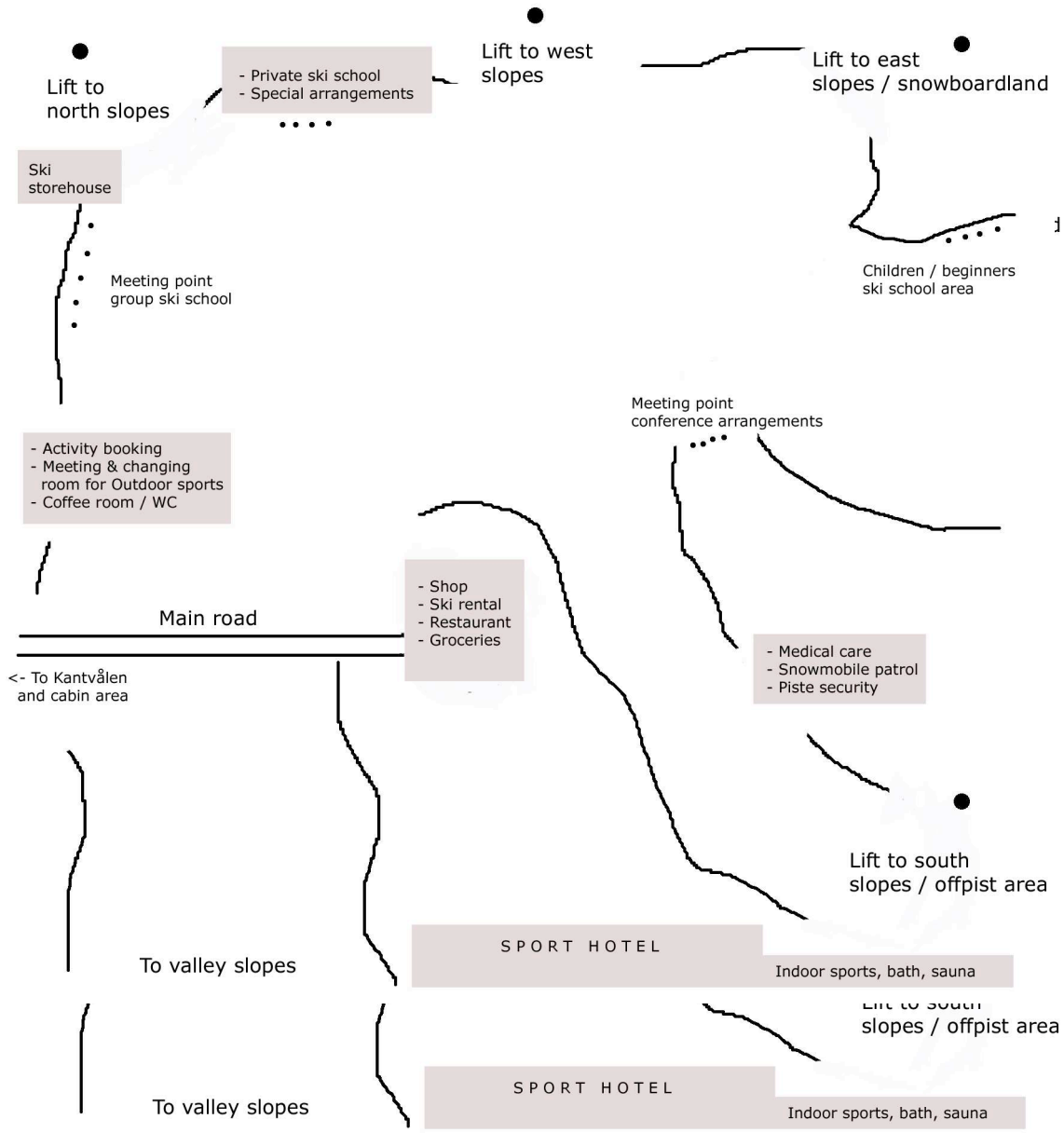
- As a complement to the new activity booking system we need a web site where the guests can browse offerings and do their own bookings. We believe that the functionality and appearance of the web site will be quite different comparing to the system that will be used at the booking office, in terms of usability and efficiency demands. We have very little experience from business-to customer e-commerce, but would like to see some proposals to this as well.

This list was aggregated from the informal discussions with booking staff, ski instructors, team leaders and conference staff. Apart from what is described in the list, there may be other system services that could prove to be useful. Here it is up to you to make suggestions and make assumptions.

[2] A mountain close to Sicklafjäll.

Map

Finally, here is a simple map over the work area.



HT06

HCI-A

Course Guide

INF661, Human Computer Interaction: Analysis
Lund University
Informatics

Contents

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General information

This is an introductory course to the subject of HCI and Interaction Design (ID). It covers fundamental concepts, principles and paradigms in HCI. The main focus of the course is on analysis and evaluation of human-computer interfaces, but the course contents rely much on practical design exercises as examples for discussion. Some of the fundamental questions put forward are: What are the driving forces behind the development of human-computer interaction as design practice and as academic subject? What is "good" interaction, and how is it designed? How can we assess quality? Is interface quality measurable, and if it is, how should we measure it? What does new technology have to offer in terms of new possibilities for interaction?

The course spans over five weeks full-time, corresponding to 5 credits in the Swedish system and 7.5 credits in the ECTS system.

We use the First Class system extensively, especially the "INF661" course conference, both for announcements and to publish course material. Try to check the latest news on FC every day to be updated, e.g. on schedule changes.

Exercises

There are two exercises in the course carried out in groups of up to four persons. The first exercise concerns usability evaluation of three interfaces (see "evaluation exercise" below).

The other exercise is focused on an interaction design task. Apart from producing a concrete solution to an interaction design problem, you will also write a design report where results and methods from the interaction design project are reflected and commented upon using the main course text (see "design project" below).

Written Exam

The written exam is based on the whole course text, including the main book (Preece et al, 2002) and the two article compendia. Any additional reference articles handed out are not included in the exam.

Course requirements and grading

Both the written exam and the design project report are graded from 5 to 9, where 5 - 7 are pass and 8 - 9 high pass. The evaluation exercise is graded in pass (P) and no pass (NP) only. To pass the course you are required to carry out both exercises and pass the written exam. To get high pass for the course as a whole you are required to carry out both exercises, pass the written exam and have a minimum total grade of 7.5. Credits are as follows:

Examination	Swedish credits	ECTS credits	Grading
Written exam	2	3	5-9/No pass
Evaluation exercise	1	1,5	Pass/No pass
ID project	2	3	5-9/No pass
Total	**5**	**7,5**	

Literature, key-cards

The main course text, "Interaction Design – Beyond Human-Computer Interaction" (Preece et al, 2002, John Wiley & Sons) can be bought in the bookshops or via Internet. The book costs about 41 Euro at Akademibokhandeln (www.akademibokhandeln.se), and on the Internet you will find reasonable prices and delivery times at Amazon (www.amazon.co.uk). The teachers provide the articles and additional course material to cost price.

You need a key-card to get access to the Interaction Lab (room 211). Please, make sure that you get one as soon as possible by filling out a list provided by your teacher at Lab 1. During the scheduled labs your lab teacher will let you in. It is forbidden to let anyone not

taking part in the HCI Analysis course in the lab, except for test users during the design exercises.

Course activities

Activity	Schedule	Contents
Lectures	L	In the lectures the main themes of the course text are outlined.
Labs	Lab	In the Interaction lab will we learn how to use essential tools for designing and evaluating prototypes and systems.
Workshops	W	At the workshops we study and discuss design principles, methods and interface examples.
Seminars	S	At the seminars (activity "S") results from the design exercise is presented and discussed in class. Attendance is mandatory.

Lecture and workshop overview

This is the outline of the course as scheduled. Come to lectures and workshops well prepared, which means that you have read the book chapters and articles suggested for each activity below.

L1 - Introduction to Interaction design

- What is interaction design? From GUI, through HCI to Interaction Design
- The goals of interaction design: usability and user experience
- Usability principles and heuristics
- Understanding interaction: interaction paradigms & conceptual models

Readings: Preece et al. ch 1, 2, (6), (10), (15), articles by Jordan, Ishii & Ullmer, Weiser.

Note: The chapters in brackets are good to read as a brief overview of the book as a whole, but will appear later in the readings as well.

L2 - Evaluating user experience and usability: part 1

- What, why, when to evaluate?
- Evaluation paradigms, the DECIDE framework
- Evaluation approach 1: Testing and modeling users

Readings: Preece et al. ch 10, 11, 14, article by Rubin.

L3 - Evaluating user experience and usability: part 2

- Evaluation approach 2: Observing users
- Evaluation approach 3: Asking users, asking experts
- Summary: the evaluation framework revisited

Readings: Preece et al. ch 12, 13, 14, (11), article by Tognazzini.

L4 - Understanding users

- Cognition and learning
- Metaphors and mental models, information processing
- Collaboration, communication and awareness
- Affective aspects

Readings: Preece et al. ch 3, 4, 5, article by Suchman.

L5 - The Interaction design process: part 1

- Basic activities
- Who are the users?
- Interaction design models
- Identifying needs & requirements
- Task description and analysis
- Prototyping, conceptual and physical design
- User-centered design, ethnography and participatory design
- Summary: design and evaluation in the real world

Readings: Preece et al. ch 6, 7, 8, 9, 15, articles by Gould, Saddler & articles by Löwgren, Cooper.

W1 - Design heuristics

Readings: Repeat readings from L3.

W2 - Design and evaluation methods

Readings: Repeat readings from L5, L6.

Please note that the suggested literature from the course text is also the literature base for the written exam.

I/Lab

An exclusive facility for this course is the Interaction lab (room 211). During the course you will spend some time in our Interaction lab getting to know the software tools available. You will need this for the coming design exercise, and especially if you are not familiar with the tools provided it is a good idea to spend some extra time in the lab. We will also utilize this space and its resources for workshops as well as projects during the course.

- Lab1 – Video analysis
- Lab2 – Introduction to the Interaction lab
- Lab3 – Dreamweaver introduction and tutorial

The evaluation exercise

Evaluating human-computer or human-machine interfaces is both an essential part of the process of designing interfaces and a good way to get started in thinking about quality aspects of interfaces in use. Therefore you will do three evaluation exercises in the first weeks of the course, all with different approaches to evaluation. The exercises will be carried out in work groups.

Finally you merge what you have written for the three exercises into one evaluation report. This report is handed in to the teacher for the evaluation exercise at the time specified on the schedule and the 'important dates' handout. The report should be mailed to the examinator as a PDF attachment, named course and group number, the exerices and date (i.e. inf661-group4-evalation-020130.pdf).

The interaction design project

The intention with the design project is to stimulate your learning process by giving hands-on experience in interaction design and evaluation together with user representatives. You

will work with a design case called "Outdoor sports", which will be presented later. Your group will plan the approaches, methods and techniques for the design process at workshop 2. The results from your project are presented in three stages:

- For seminar 1: A proof-of-concept is presented. The concept should have been evaluated with someone outside the design team.
- For seminar 2: A prototype together with results from usability evaluation is presented.
- A design report is handed in after seminar 2. The report should include the project results, descriptions of your way dealing with the design problem, representations used as well as critical reflections regarding your method and your results with clear references to the course text. More instructions for the design report will be handed out when the design project are introduced.

And finally…

…right now you are probably a bit confused, wondering what the HCI subject is all about. But we got some advice: some good introductory texts can be found at ACM SIGCHI[1] web pages. Take a look at www.acm.org/sigchi, especially the SIGCHI Curriculum Development Group's Report for definitions and a brief overview. You could also become a member of the ACM CHIWEB mailing list (see sigchi.org/listserv/). It is very useful to see what current discussion topics are, to pose questions and get answers on the subject of HCI. The list could also be viewed from our First Class course conference in the "CHI-WEB" folder.

To learn something from the ten weeks we work together it is very important that you take an active part in the seminars, lectures and workshops. Also remember that true learning comes when you put your theoretical knowledge to work in design activities and discussions about design.

We welcome you to the course and wish you good luck!

// The HCI teacher team

[1] Abbreviation for: Association for Computing Machinery, Special Interest Group on Computer-Human Interaction.

Fall06

HCI-A

Evaluation exercises

Human Computer Interaction: Analysis
Lund University
Informatics

Content

The evaluation exercises

Evaluating human-computer or human-machine interfaces is both an essential part of the process of designing interfaces and a good way to get started in thinking about quality aspects of interfaces in use. Therefore you will do three evaluation exercises in the first weeks of the course, all with different approaches to evaluation. The exercises will be carried out in work groups.

Finally you merge what you have written for the three exercises into one evaluation report. This report is handed in to the teacher for the evaluation exercise at the time specified on the schedule and the 'important dates' handout. The report should be delivered on paper.

Below, the three exercises, the suggested methods and the evaluation report are described in detail.

Exercise 1 - Video analysis

During the first week you should do a usability evaluation with user representatives of selected functions in one of the programs in the MS Office package. You are requested to find a test user (for example a fellow student) and to introduce her/him to the evaluation procedure. You should also prepare a simple interview form with a couple of pre- and post questions. A description of the selected functions will be handed out on lab 1.

Data collection

The video data is collected during the first lab session (lab 1 on the schedule). A videotape is supplied by our teacher. Three groups are scheduled on each session in the Interaction lab. During the lab you should record your video and start your analysis.

1. Two group members prepare your user for the test and explain what is going to happen. Make sure that you consider the ethical considerations for user testing handed that you find at the end of the description of the evaluation exercises. Ask the pre-questions from your interview form.
2. Meanwhile, the other two group members set up the camera and make sure that it works properly by doing a test recording.
3. Record the user carrying out the tasks one by one on video. Remember to ask the subject to "speak out" her / his actions, i.e. think-aloud.
4. Ask the subjects the post-questions from your interview form.
5. Thank the subject for his / her participation and leave your contact information.

Data analysis

Note: It is absolutely crucial that you carry out this analysis as close to the video recording session as possible, and it must be done during the same day as you did the recording.

1. Each group member should write what he/she remembers as the most important problems from the test session on small pieces of paper or Post-It notes.
2. Next each group member presents his/her notes for the others and put them on a table or whiteboard. As you present your notes you should put them next to notes with similar problems already on the table/whiteboard. When you are finished you should have a number of clusters with similar problems. You may end up with some 'clusters' only having one note, but that's OK. You should not group problems with fewer similarities just to avoid one-note clusters.
3. Next you rate each cluster as being either 'critical', that is problems that cause a lot of confusion or repeated misunderstandings, 'non-critical'. For each cluster, find out how many users that had problems in the cluster. If you only carry out one video observation, this is not applied.
4. Make a list of the clusters sorted in reverse order by number of users and divided into critical and non-critical problems.

	Problem
Critical	Brief text describing problem cluster Brief text describing problem cluster Etc
Non-critical	Brief text describing problem cluster Etc

Example list of usability problems.

5. Take the three top problems in the list (meaning that if you only would have two critical problems, you include the first non-critical) and go through your video material to find at least one part where each problem occur. Then write a short analysis of what you have discovered. For each problem try to find the cause and reflect over why it happens. Note: you should not suggest any improvements in the design, just point out the problems and try to describe why they seem to occur.

Exercise 2 - Observation

Your assignment in the first week is to evaluate the interface of for example some vending machine for snacks by observing it in use and find usability problems. You are allowed to use other vending or ticket machines for the evaluation, for example the ticket machines at the railway station (the 'Pågatåg' vending machines) or some other man-machine interaction case that you find interesting, and have the possibility to observe.

Collecting data

1. Observe at least *ten users* and take notes of what users do when they use the machine. Pay particular interest to problems or confusions that arise during use. To give you a feel of what a usability problem could look like, imaginary examples could be described as 'the user did not seem to understand the function of the button X', or 'the user did not realize that the money inserted was not enough'.
2. You are allowed to ask the users if they have problems. For instance, after a problematic interaction with the machine you can ask the user what caused the confusion and so on, but you are not supposed to do an interview with the user.

Analyzing data

After observing all users you should sit down and go through all problems that you have encountered. For this part it is recommended that you use Post-It notes and have access to a large table or a whiteboard.

1. Each group member should go through his/her observations and write observed problems on a small piece of paper or a Post-It note. If you find several problems that are similar you write a description that covers all similar problems on one note.
2. In the next step each group member presents his/her observations for the others and put the notes on a table or whiteboard. As you present your observations you should put your notes next to notes with similar problems already on the table/whiteboard. When you are finished you should have a number of clusters with similar problems. You may end up with some 'clusters' only having one note, but that's OK. You should not group problems with fewer similarities just to avoid on-note clusters.
3. Next you rate each cluster as being either 'critical', that is problems that cause a lot of confusion or repeated misunderstandings, 'non-critical'. For each cluster, find out how many users that had problems in the cluster.

4. Make a list of the clusters sorted in reverse order by number of users and divided into critical and non-critical problems. See evaluation exercise 1 above.
5. Take the three top problems in the list (meaning that if you only would have two critical problems, you include the first non-critical). Finally you write a short analysis of what you have discovered. For each problem try to find the cause and reflect over why it happens. If possible, you may want to start this discussion in front of the machine. Note: you should not suggest any improvements in the design, just point out the problems and try to describe why they seem to occur.

	Problem	*No. of users*
Critical	Brief text describing problem cluster	4
	Brief text describing problem cluster	2
	Etc	1
Non-critical	Brief text describing problem cluster	3
	Etc	1

Example list of usability problems.

Exercise 3 - Heuristics

The last exercise is a heuristic evaluation as the one carried out in workshop 1 (W1). You should perform a heuristic evaluation of the First Class-client software using the heuristic principles from workshop 1.

Create a list of problems sorted by the heuristic principles.

Pick the three problems you consider being the most severe and write a short analysis of what you have discovered. For each problem, try to find the cause and reflect over why it happens. Note: you should not suggest any improvements in the design, just point out the problems and try to describe why they seem to occur.

The final evaluation report

Finally you merge what you have written for the three exercises together with the tables you have created into one report. This report is handed in to the teacher for the evaluation exercise at the time specified on the schedule. The report should be delivered as an attachment to an email to the examinator, and make sure to name the attachment this course code as well as your group number, the exerices and date, e.g. <inf661-group4-evalation-020130.pdf>.

Fall06

HCI-A

Workshop 1 – Design Heuristics

Human Computer Interaction: Analysis
Lund University
Informatics

Content

Design Heuristics

In this workshop you will get and hands-on experience in performing a heuristic evaluation of a mobile phone (part of the exercise was copied from the Molich and Nielson Comm ACM Paper).

The Heurist Evaluation Process

- Pick 5-7 of the following guidelines
- Reformulate these into a set of heurists for evaluating mobile phones.
- Turn these heuristics into questions to be used in the evaluation.
- Evaluate your phone's text message function.
- Last, compare your notes with 3-5 other evaluators.

A Basic Guideline

- Simple and natural dialogue
- Be consistent
- Provide shortcuts
- Use the user's language
- Provide feedback
- Prevent Errors and Deal with errors in positive and helpful manner,
- Minimize user memory load
- Provide clearly marked exits
- Provide help and documentation

Presentation of results

The results from the evaluation should be summarized on two slides; first slide with selected heuristics and questions, second slide with a ranked and categorized list of your findings .

Reference:

- Molich & Nielsen (1990): Improving a human-computer dialogue. Communications of the ACM.
- ACM Interactions, Oct –98
- URL: www.useit.com (Jacob Nielsen's Website)