

# The new Science Library web app

## INF2260 - Human Computer Interaction

Master group - Fredrik Sørensen, Yang Zhang, Geir Snorre Berge



# Table of contents

<b>Table of contents</b> .....	<b>2</b>
<b>Introduction</b> .....	<b>3</b>
The assignment .....	3
Meeting with the client .....	3
The idea behind the app .....	3
Why four functions? .....	3
Why web app instead of native app? .....	4
<b>The Design Process</b> .....	<b>5</b>
The Prototype .....	5
Building the prototype .....	5
Final layout and prototype .....	5
Pulling the user in and News feed .....	5
Persuasive technology .....	6
Awareness cues .....	7
Final prototype .....	7
Usability testing .....	10
Planning .....	10
Test setup .....	11
Execution .....	12
Results .....	12
SUS (System Usability Scale) in the usability testing .....	13
Experimental Design .....	14
Description of the experiment .....	14
Experiment .....	14
Pool of test subjects .....	15
Limitations and possible biases .....	15
Results .....	16
<b>Conclusion</b> .....	<b>17</b>
<b>References</b> .....	<b>19</b>
<b>Appendices</b> .....	<b>20</b>
Appendix A: LCD-Monitor to hang in the library lobby / aula .....	20
Appendix B: Initial sketches and layout .....	21
Appendix C: Plan for Usability testing .....	22
Appendix D: Usability Testing: Pre-test questions .....	24
Appendix E: Usability Testing: Post-test questions .....	24
Appendix F: Informed Consent Form .....	25
Appendix G: System Usability Scale-form .....	26

# Introduction

## The assignment

*“The new science library opens in March next years, so now the library is looking for some great and innovative smart solutions that were not previously used in connection with libraries. They might be based on tablet PCs or mobile services. The examples that were presented in the lecture were a bump function on the phone for a downloading the weeks' article, or an app that will promote the "Book a Librarian" service. They are only illustrative examples, all smart and surprising new technological solutions will be considered.”*

(From the Project Possibilities)

## Meeting with the client

At the beginning, we arranged a meeting with Live Rasmussen who is head librarian of science library. As far as her concerned, this web application should include at least seven functions, which are in the list below:

- Searches: Search book, journal and e-book, which can be read from cell phone.
- Reserve and Renew books
- Reserve help from librarian
- Book group rooms
- News feed
- Map of the library
- Force loading application when access the Wi-Fi in library

According to the list above, the client wants to make the boiled-down web application from library website at hand.

## The idea behind the app

The new science library web application is an online service for students who use their cell phone in the library to reserve with librarian for guidance to thesis assignment or project, to book a group room for discussion, to read news feed and to view the library map.

## Why four functions?

These four functions, to some extent, are connected logically. For example, when you start to write thesis, you may need **reserve with librarian** for searching related literatures and when you have brainwave idea during reading, you need **book a group room** discuss with somebody. To the novice of library, guide tour can be offered by **map** directing you to explore in a more flexible way. When you get interesting activity from **news feed**, the most instant and convenient way to invite friends to join in is to share on Facebook or Twitter. In brief, we hope to change library into a social and work arena.

After the meeting with the client, we tried to do some paper prototypes for each function and the web application in general, but we were struggling in a loop of how to construct each page reasonably and make the interface pretty. It is huge work relative to the limited time and resource. After discussion with Alma, we understood the way to go, so we decided narrow down to the four functions which are not the common usage in library website, the client want to prompt most and make sense to use within the library.

### **Why web app instead of native app?**

As to both kinds of app, each has pros and cons. For our project, the web app is more appropriate due to its adaptation of multi platforms (iOS, Android), so we do not need to build multiple application for different devices and the promotion of HTML5/CSS3 which bring more new figures and high performance for mobile website development.

# The Design Process

## The Prototype

We decided early to create a high fidelity prototype to get a prototype resembling a real implementation as much as possible. We went with a *genius design* approach, to save time and resources at the start of the project and get started with designing the prototype as soon as possible and also to generate a creative solution without taking prior bias of users prior experiences into the solution (Michael Hawley, <http://www.uxmatters.com/mt/archives/2009/01/design-research-methods-for-experience-design.php>).

The design of the prototype went through 4 iterations of changes in total, one who was prompted by showing the design to an expert (this subjects teacher) and one prompted by the first round of usability-testing. The first layout can be seen in appendix B.

## Building the prototype

The prototype was built as a web app. This was to not exclude any potential users by developing for a specific platform, for example android or iOS. The technologies we have used in designing and building the prototype are:

- Paper and pencil for thumb sketches and rough layouts.
- Adobe Photoshop to design interface based on rough layouts.
- HTML5, including the HTML5-boilerplate template for markup code.
- CSS3 for visual styling, including using Compass / SASS for more effective and organized coding.
- JavaScript and the jQuery-library for building functionality, ajax-loading, creating animations and setting cookies.
- jQuery Mobile for styling the form elements to be usable on small screens.

The prototype was mainly designed from mid September to mid October and developed mainly from October 17th to November 1st, but were improved and developed through several iterations after presenting the app to others and between the two sessions of usability testing.

## Final layout and prototype

### Pulling the user in and News feed

One of the conceptual problem areas we were faced with was the issue of making potential users aware of the app. We discussed this with Live from the library, and found that one solution might be that when on the WI-FI spots in the physical building on a mobile device the browsers' home page could be hijacked to send the user to the web app.

An alternative route we came up with to get the user in to the application was to install large 50" LCD-screens in the common areas of the library (See appendix A). These could promote the short URL of the mobile app, the twitter-account and the hash tag of the library, but also show a real-time version of the news feed included in the app. Hopefully, in this way users could not

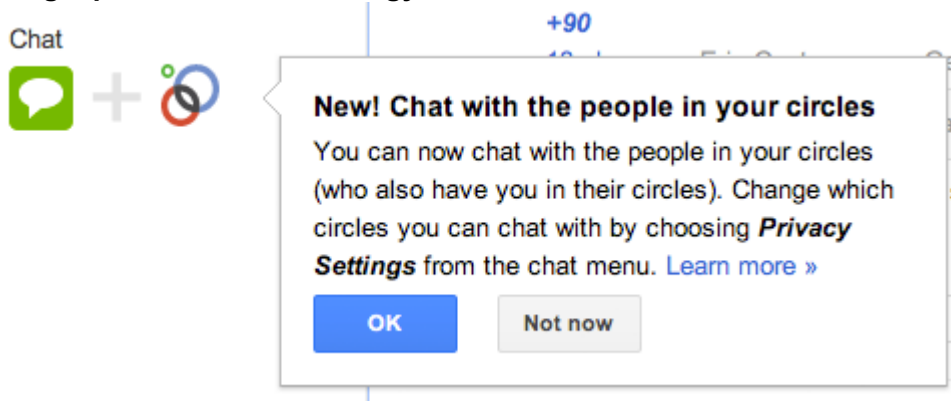
only read news from the library, but also see and interact with both the library itself and also other users using the app or being in the vicinity of the 50" screens.

## Persuasive technology

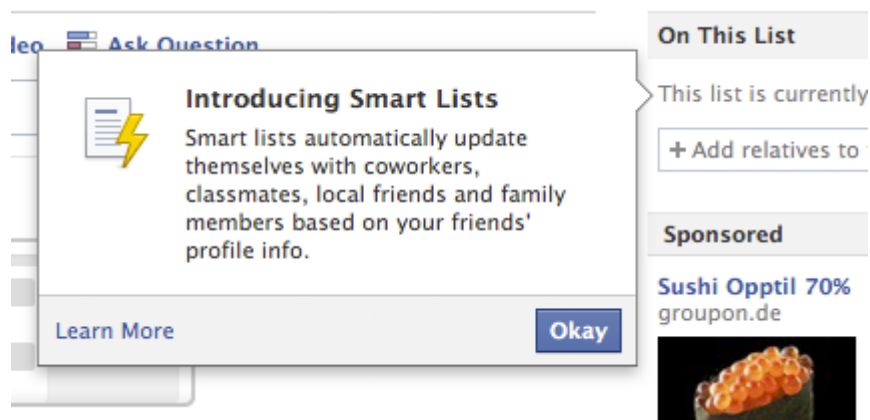
One of the problems about the current "Book a librarian"-service is that no one seems to use it or is aware that it even exists. We tried to do adjustments to the design in our take on the service by introducing persuasive technology to inform users about what "Book a librarian", or as what we decided to name it "Librarian, help me!" really is.

We followed the loose process described in "Creating Persuasive Technologies: An Eight-Step Design Process" (Fogg, 2009) and drew inspiration from the Facebook and Google boxes informing about changes and new services to create our own persuasive technology (see examples below).

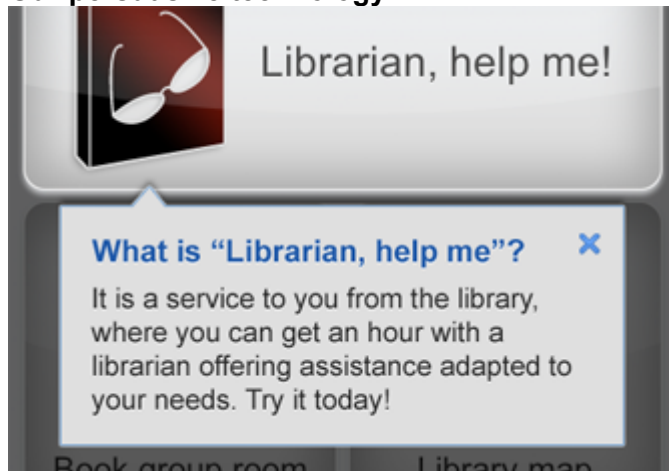
## Google persuasive Technology



## Facebook persuasive technology



## Our persuasive technology



## Awareness cues

To emphasize other parts and information of our application, we dived into a concept called awareness cues. An awareness cue is basically *"...computer-mediated, real-time indicators of people's undertakings, whereabouts, and intentions."* (Oulasvirta, 2009).

We implemented this in our prototype by using visually striking "counters" to draw the users awareness to certain parts of the application showing the state of the services. Examples of our implementations can be seen in the screenshots in the following section. They are:


- The "unread news items" counter at the bottom of the front page
- Group room available, librarians available and waiting times for a librarian, in the info box on the front page and on the respective sub pages


## Final prototype


There are five main screens in the Science Library-app. The screenshots on the following page are of the final app, after the final iteration of design and functionality changes were made.

### Front page / opening page

UiO : Science Library Log in

 Librarian, help me!

 Book group room

 Library map

**Library services**  
Group rooms available 8  
Librarians available now 3  
Estimated waiting time for librarian (in min.) 0

Library News Unread news items 1

### Librarian, help me!

UiO : Science Library Back

## Librarian, help me!

**What is this?**  
Working on an assignment or a project?  
Need help searching for information?  
[Get help from a librarian now!](#)

**Current status**  
People in queue 0  
Librarians available 3  
Estimated waiting time(in min.) 0

17:44 (now) ▼

**Book librarian now**

### News feed

Library News Unread news items 1

 **Official opening of the new library**  
The new Science Subjects Library official opening is scheduled for march 2012.

 **Official opening of the new library**  
The new Science Subjects Library official opening is scheduled for march 2012.

 **Official opening of the new library**  
The new Science Subjects Library official opening is scheduled for march 2012.

 **Official opening of the new library**  
The new Science Subjects Library official opening is scheduled for march 2012.

 **Official opening of the new library**  
The new Science Subjects Library official opening is scheduled for march 2012.


 **Official opening of the new library**  
The new Science Subjects Library official opening is scheduled for march 2012.

 **Official opening of the new library**  
The new Science Subjects Library official opening is scheduled for march 2012.

### Book group room

UiO : Science Library Back

## Book group room



Select a room on the map to book it

No group room chosen

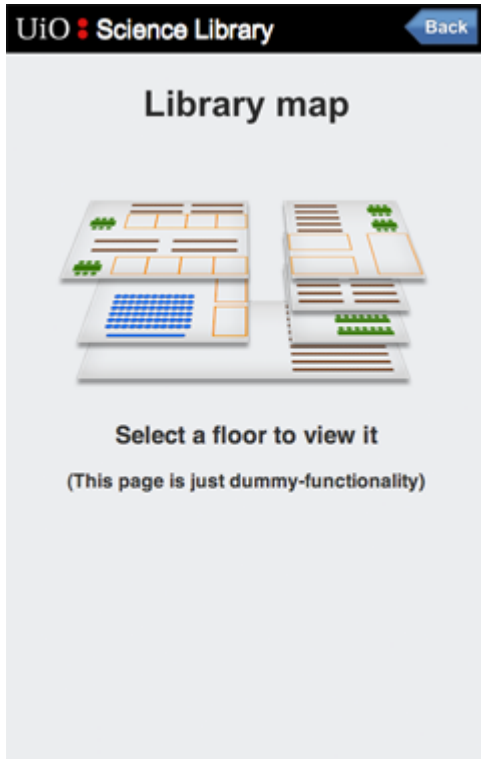
**Current status at 17:44**  
Group rooms available 8

17:44 (now) ▼

**Book group room now**



## Library map



The app can also be viewed and tested at this url: <http://www.robotrobot.com/rflibrary/>  
To reset all cookies and settings to make the app appear as a first time visit, go to this page:  
<http://www.robotrobot.com/rflibrary/reset.php>

## **Usability testing**

After we created the prototype for our app, we wanted to validate the design, identify logical flaws and get some input from the user on how the app actually performed. All though our prototype did not include any back-end functionality and wasn't actually connected to any of the services at the library, we had implemented the design as we planed, and it was possible to test out the process of booking a librarian and booking a group room.

Our test sessions spanned over two days, and included 5 test subjects. As stated by (Lazar, et. Al. p260, 2010), our testing can be seen as summative testing of an high fidelity prototype. The main goal of the tests, was to test the effectiveness of our design decisions and to identify possible logical flaws. With 5 test user, we would be able to identify 80%, according to (Lazar, et. Al. p263, 2010), all-though this may be a disputed fact.

We took a gonzo and guerrilla (Toftøy-Andersen and Wold, p129, 2011) approach to our testing, as we sought out the respondents at the library. Our initial idea, was to ask people at the temporary science library, to part take in the testing, without recruiting users prior to the testing. The first day of testing, we had to abort this plan, because the library was empty. Ideally we should have recruited a lot more test users, and then picked out the most viable candidates in respect to our target group.

## **Planning**

Prior to the test sessions, we made a test plan, for guidance during the test sessions (Appendix C). The purpose of this plan, was to ensure continuity in the test sessions, and make sure every user had the same experience.

The test plan included specification of the "lab"-setup and the target group of our tests, and included the tasks to be performed, including the questions for a preliminary and closing interview.

We planed to use open-ended task. After the first two sessions, we decided to use more semi-open tasks. This choice was made, because the open-ended tasks was more time consuming, and many of the users we recruited also were students with imminent exams and projects to be finished. In other words, time was of the essence.

## Test setup



The photo above shows our test setup. This was the first setup at the IFI building, but an identical setup was used in a group room in the temporary science library in the physics building.

### The numbers on the photo corresponds to these points:

1. Test area with mobile device
2. Video camera, filming (only) area #1
3. User / respondent testing the application
4. Test leader
5. Documents, including "LCD-monitor" imagined to be in the library entrance
6. Machine running the application server and notes for Test leader
7. Observer
8. Motivation for the respondent

## Execution

We chose to conduct the tests in Norwegian, to make the threshold for taking part in the usability testing, as low as possible. During the test sessions, one of the group members would act as test leader, and the two others observed and took notes. The two Norwegian-speaking group members alternated between the role as test leader.

Before each test sessions we made sure the equipment was prepared and ready for use, and afterwards we would discuss the results and take some final notes. We also videotaped each test session with permission from the user, so we could analyze the video at a later stage.

After the two first test, we decided to change the task from open to semi open, and selected a more explicit wording of the tasks. We also made some changes to the prototype, after we discovered some distracting bugs. But it is worth mentioning that we didn't do any major changes, because we didn't want the app to differ too much from the first test to the last.

## Results

In general, we did not discover any major problems with the app. But it became very apparent that the wording of the tasks was important, as some of the test subjects struggled a bit, because they didn't understand what they were suppose to do. As we have mentioned earlier, we changed the tasks to accommodate this problem.

We conducted 5 tests, where three of the users were students at IFI, one studied math and physics and the last one studied economics. Only one of the respondents actually owned a smart phone, but most of them were comfortable with using handheld devices. We didn't manage to recruit any females' respondents, so only male students tested the app.

These are some of the discoveries we made during the user testing:

- It is not possible to select or specify for how long you want to book a group room.
- The design of the select box for choosing a time slot confused some of the users.
- The map for selecting group rooms might be a bit small.
- The designs of the status boxes are too similar to the buttons on the front page. This led some of the user believe that they could click on them.
- It seemed like the users didn't read or pay much attention to the feedback and dialog boxes.

The issue with users getting confused by the select box, might be explained by their limited experience with the device we used to test the app. Also one of the user didn't select a group room before he booked it, which raised the question if it should be mandatory to select one prior to booking it. Automatically delegating a available group room, would make the booking processes easier.

## **SUS (System Usability Scale) in the usability testing**

After the test-tasks were completed for each respondent, we made them fill out a System Usability Scale-form. As described in the paper by John Brooke, this form should be filled in immediately after using the system in question, but before the debriefing interview or discussion. This is so the respondents' immediate impressions are conveyed, before they get the chance to think too much about the items. (Brooke, 1996).

The paper by John Brooke says very little about how to read this score, but some people on the internet argue that *“Any value around 60 and above is considered as good usability”* (<http://www.zabisco.com/blog/?p=2502>) while others argue that the SUS scores are not percentages, and the average score would be approximately 68 and you could say this is the 50% mark (<http://www.measuringusability.com/sus.php>).

The total SUS-score of the system in the usability test were **75.42** out of **100**, so we could argue the perceived usability of our system is above average and leaning towards good.

## Experimental Design

The aim of our experiment was to possibly validate the usability our design compared to the design of the library's existing solution. The focus of this experiment was exclusively on the implementations of the "Book a librarian"-service, because it is the only function implemented both by us and in the current library website.

### Description of the experiment

The experiment was performed on potential users (students) of the science library. We selected random students walking the halls of the IFI-building and asked them to participate in a short experiment concerning usability. The experiment itself were conducted in a group room in the IFI-building with a tidy setup, good lighting and

They were presented with the start page of the library-website and the start page of the mobile web app and asked to find the correct service and use it to book time with a librarian. Immediately after testing one of the conditions, the participants were asked to fill out a SUS-form (System Usability Scale) for the service just tested. The order of what solution the respondents tested was randomized by a coin toss, so that neither us as researchers or the participant could predict which condition they would be exposed to first (Lazar, et. Al. p28, 2010).

### Experiment

#### H0:

There is no difference in subjective usability of the system between using the "Book a Librarian"-function on the library website and the "Librarian, help me!"-function in the mobile web app, when booking time with a librarian.

#### H1:

The "Librarian, help me!"-function in the mobile web app has higher subjective usability than the "Book a Librarian"-function on the library website.

#### Independent Variables (IV):

Technical online solution for booking time with a librarian.

#### Dependent Variables (DV):

Usability of the system, measured by filling in a form System Usability Scale-form (SUS-form) by rating ten statements on a Likert scale from 1-5, where 1 is "I strongly disagree" and 5 is "I strongly agree" (Tøftoy-Andersen and Wold, p148, 2011).

#### Condition #1:

"Librarian, help me!"-function: Mobile app webform by the researchers (<http://www.robotnobot.com/rflibrary>)

#### Condition #2:

"Book a Librarian"-function: Form on existing library website (<http://www.ub.uio.no>)

#### Type of design:

"Within group design" was chosen because of the need for fewer participants in the experiment and also it is better suited for "...complicated tasks such as reading comprehension, information retrieval and problem solving, ..." (Lazar, et. Al. p51, 2010).

## Pool of test subjects

The target group for the experiment is students in the Mat-Nat faculty of both sexes. Because of time limitations, we decided to test the conditions on students in the IFI-building. We tested a total of 5 respondents, 3 male and 2 female, all of which were students at IFI.

We are aware that most people in the IFI building are IT students of some sort, and therefore might have a higher technical competence than the average user of the Science Library. Because of this, there might be a chance for systematic errors or bias in the way of scoring usability higher on both conditions in general, and their experience with smart phones and web apps.

The IFI-students are still potential users of the Science Library, but in an ideal situation we would seek a larger number of participants in the experiment and also greater diversity among them in fields they study in the areas the Science Library cater for.

## Limitations and possible biases

- The amount of participants in the experiment should ideally be larger and more diverse
- Some might have had knowledge of the existing service from before, but all the participants in our experiment claimed to not having used the “Book a librarian”-service before.

## Random errors

The Wi-Fi-coverage in the IFI building is at times very poor, at least when using it from a mobile device. 3G coverage is also very poor, maybe because of the buildings construction. We experienced that ajax-calls from the prototype we built (condition #1) were slow and failing at times, and this might have lowered the usability score for that condition.

There were also a few bugs in our prototype, which were noticed by some the participants, if they used the service in a specific way. This might have influenced their experience of how well the service was functioning.

## Systematic errors

- *Bias due to experimenter behavior.* We did not write down explicit wording for presenting the tasks to the participants, so there might have been variations in how well they understood the tasks. We acknowledge this could have a great impact on the final result, and we would definitely correct this in a possible future experiment.
- *Bias caused by participants.* As earlier mentioned, all of the tested were students at IFI, and would presumably have a higher technical knowledge and experience than the average user of the science library. Some of the participants might also lack the interest in of the motivation to perform the experiment. This could also affect the score by them possibly scoring the conditions at random to finish the experiment quicker.
- *Bias caused by experimental procedures.* Since all participants test both conditions, there might have been a learning effect in the experiment and the participants could have based their last scoring on their subjective perception of the exposure to the first condition. We tried to correct this by randomizing the condition the participants were testing first.

## Results

The final results of our experiment were as follows:

**SUS score, condition #1 (our prototype):**

**79.17**

**SUS score, condition #2 (existing service):**

**68.75**

Even though there are possibilities for systematic and random errors in this experiment, we would argue that the difference between SUS scores are quite large and in favor of our prototype.

On that basis we decide to discard our H0 hypothesis and go with the H1-hypothesis, *“The ‘Librarian, help me!’-function in the mobile web app has higher subjective usability than the ‘Book a Librarian’-function on the library website.”*, and in that way validating our design choices and claiming our solution is more usable than the existing solution.

In terms of putting American style letter grades on the results, we could say that the existing solution gets a C, scoring the average number of points for SUS score studies, while the prototype scored something along the lines of a B+ (Sauro, <http://www.measuringusability.com/sus.php>).



## Conclusion

After finishing the prototype, we conducted the usability test and experimental design. What we learnt from this phase of the project was that usability testing is not necessarily as easy as it seems, it requires both planning and practice. It could be done “quick and dirty”, but you risk missing out on vital information.

On the other hand when done right, usability testing highlights surprisingly many flaws in the design that we as designers might not be aware of because of our deep involvement in the project. This is especially true when it comes to logical flaws, such as failing to mention what the timestamp in a drop-down box is intended to mean. From this we also found that small adjustments to the design can have major impact on the usability.

What we found to be the hardest part of usability testing, was the process of recruiting test users. Ideally you would like to recruit people that adhere to the target group, but this is easier said than done. Some are reluctant, and isn't motivated to take part in user testing, but providing the test user with chocolate, did help on the motivation.

There are surprisingly many sources of bias that might influence an experiment. One of the clearest pitfalls when performing the test is the wording of the tasks are important and that the test leader / experimenter uses consistent and clear wording when presenting information to the participants.

As far as we are concerned, usability tests and experimental design have some implicit connections with each other, in other words, we hope the result of experimental design can improve the validity of usability test. In fact, after completing two procedures, we find that the method used in usability testing is similar in experimental design e.g. both need task instruction and survey to measure user satisfaction.

The goal in usability testing is to find bugs and fix it but in experimental design is to prove a statement.

In usability testing, treatment/condition can be changed (the interface may be changed according to the last feedback) but in experimental design, it should be strictly consistent from start to the end. The recruitment in usability testing can be more flexible in terms of participants you select than in experimental design. There the selection of participants should be more random.

In retrospect, we clearly see that it would have been useful to include the users in an earlier stage of the design process, to help us locate some main areas of focus from the users perspective. To do this we could have arranged a focus group with potential users of the library and the library website to map out what issues they felt were vital and what services they would like to use, both inside and outside the science library.

At minimum we should have conducted some ethnographic observations of users and how they interact with the library staff, concerning the “Book a librarian”-service and conducted quick semi-structured ethnographic interviews with the librarians.

Possible future enhancements of our prototype could be

- An interactive, realistic map over the science library with descriptive texts and figures for the different areas and sections of the building.
- A feature for how long the user wants to book group room for.
- Make a mobile version of the library website, including features like
  - A “My page” to administer your loans, previous loans history and so on.
  - Book search.
  - Downloading e-books and articles to the users device.

## References

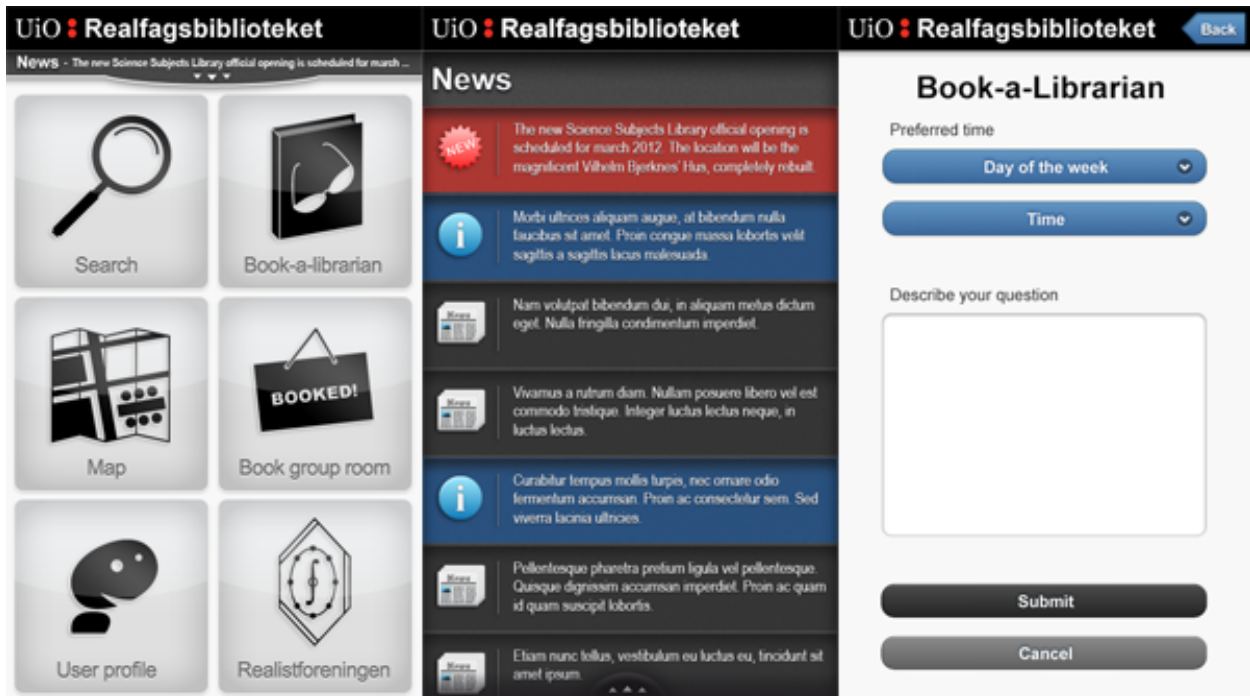
- Brooke, J. (1996). *SUS: a "quick and dirty" usability scale*. In P. W. Jordan, B. Thomas, B. A. Weerdmeester, & A. L. McClelland. *Usability Evaluation in Industry*. London: Taylor and Francis.
- Fogg, B.J. (2009) *Creating Persuasive Technologies: An Eight-Step Design Process*
- Fogg, B.J. (2009), watched 12/10-2011:  
<http://www.youtube.com/watch?v=RWTZYq1QaDg>
- Meiert, Jens O., read 24/11-2011: <http://meiert.com/en/blog/20091127/sus-how-to-grade/>
- Lazar, Feng and Hochheiser: *Research Methods in HCI*, 2010. Wiley
- Oulasvirta, A. (2009), *Social Inference Through Technology, Awareness Systems*, Springer London
- Samara, Mariza. read 24/11-2011: <http://www.zabisco.com/blog/?p=2502>
- Sauro, Jeff. read 24/11-2011: <http://www.measuringusability.com/sus.php>
- Tøftoy-Andersen and Wold (2011). *Praktisk bruker-testing* Cappelen Damm Akademisk.

# Appendices

## Appendix A: LCD-Monitor to hang in the library lobby / aula



## Appendix B: Initial sketches and layout



## **Appendix C: Plan for Usability testing**

### **Lab setup**

- Group room in the temporary Science Library in the Physics building
- The largest room available will be booked in advance
- Person to test the application will be seated next to the test leader
- Observator(s) will be seated at the same table on the opposite side of the user, but at a safe distance so not to intimidate the user.

### **Target group**

Users of the University Library, university staff and students that are also owners of smartphones.

### **Procedures**

1. Arrange test lab
2. Reset application (cookies)
3. Wipe phone screen for smudges
4. See that video camera is correctly placed
5. Hijack user from library or physics building
6. Present test to user
7. Get user to sign consent form
8. Preliminary interview
9. Start recording
10. SUS form
11. End interview - Qualitative interview questions
12. Present user with prize (chocolate?) and thank them
13. Rinse and repeat from #2

### **Presentation of our test**

We are testing a prototype of a web application for the new Science Library on Blindern Campus, opening in spring 2012. The purpose of this app is to access and use services available in the physical library building. We want to test the functionality, the interface and the usability of the application.

We will film the testing of the application, but we are not interested in filming you, just the use of the app itself. The video material will be deleted at once when it has been transcribed and analyzed. The persons in the test lab will be test leader and one or two observators.

We would like you to try to think out loud while you preform the tasks, so that we can understand the weaknesses of our design.

### **Preliminary interview**

The purpose of this interview is to get an understanding of the “technical” skills, or domain skills, of the test subject. (Found in appendix “Usability Testing: Post-test questions”)

### **Testing**

Semi-open tasks.

### **Scenario**

You are going into the new Science Library building to do some group work.

### **Tasks**

1. You see the large LCD monitor with the internet address of the Library's web application for mobile devices. You decide to try it out. **(Goal: Open the browser and look around)**
2. You are writing a report for some group work and need some help finding the right literature. You might need help from a librarian. Try using the web app to solve your problem. **(Goal: Test login function. Book a librarian)**
3. You now have the literature you need to write your report. Your group arrives in 15 minutes and you need to get a place to work. Try using the web app to solve your problem. **(Goal: Book a group room)**

### **Fill in SUS-form**

### **End interview**

(Found in appendix "Usability Testing: Post-test questions")

## **Appendix D: Usability Testing: Pre-test questions**

1. Are you a student at UIO? (If not, are you staff?)
2. How old are you?
3. Are you a student in computer science or related to IT?
4. Do you have a smart phone?
  - a. Do you use it to browse the web?
  - b. Do you download apps?
  - c. Are you comfortable/confident using/surfing the web on your phone?
5. Do you own/use a computer?
  - a. Surf the web?
  - b. Buy tickets, books etc. online?
  - c. Net banking?

## **Appendix E: Usability Testing: Post-test questions**

1. Do you have any thoughts or suggestions about the app in general?
2. Have you heard about the “Librarian, help me!” service before?
  - a. Did you understand the purpose of the “Librarian help, me!” function?
  - b. Did you notice the box explaining “Librarian, help me!” on the front page?
  - c. Did you notice the feedback, after you booked the librarian?
3. Did you notice the status boxes, displaying information about available group rooms and librarians?
4. Did you notice the news feed?
5. Did you notice the unread news items on the front page?



## Appendix F: Informed Consent Form

### Testing Science Library Web Application

**Purpose of the Test:** The goal of Test is to evaluate the prototype of this web application that is made for the new Science Library on Blindern Campus, opening in spring 2012. Participants will be asked to use the given mobile phone to complete multiple tasks with the different services the prototype provides. Preliminary interview, Task completion times and end interviews will be used to determine whether or not this design is suitable for the students.

**Procedures:** Participation in this test will involve three phases. In the first phase, you will join the simple preliminary interview to get understand your “technical” skills, or domain skills. And then you will be asked to complete two tasks. During this period, you will be filmed. The purpose is to see how well the web application’s functionality performed in mobile phone but not your performance in conducting the tasks.

After completing the tasks, you will take part in an end interview in which we will ask some questions about your feelings of using this web application and then you will fill the system usability scale form.

**Risks/Discomfort:** You may feel eyestrain during the test. You are allowed to rest, and additional breaks are also possible. There are no other risks but if the test distresses you, it will be terminated immediately.

**Benefits:** It is hoped that the results of this study will be useful for the development of this science library web application that will help students use library service more effectively.  
**Alternatives to Participation:** Participation in this test is voluntary. You are free to withdraw and discontinue participation at any time.

**Cost and Compensation:** Participation in this test will involve no cost to you. You will be provided a really nice chocolate for your participation.

**Confidentiality:** All information collected during the study period will be kept strictly confidential. You will be identified through fake name. All materials will be deleted at once when they have been transcribed and analyzed.

\_\_\_\_\_ Participants’ signature \_\_\_\_\_ Date

\_\_\_\_\_ Group members’ signature

## Appendix G: System Usability Scale-form

**Noen spørsmål om systemet du har brukt.**

Vennligst sett kryss i kun en rute pr. spørsmål.

	Sterkt uenig					Sterkt enig
1. Jeg kunne tenke meg å bruke dette systemet ofte.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	1	2	3	4	5	
2. Jeg synes systemet var unødvendig komplisert.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	1	2	3	4	5	
3. Jeg synes systemet var lett å bruke.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	1	2	3	4	5	
4. Jeg tror jeg vil måtte trenge hjelp fra en person med teknisk kunnskap for å kunne bruke dette systemet.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	1	2	3	4	5	
5. Jeg syntes at de forskjellige delene av systemet hang godt sammen.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	1	2	3	4	5	
6. Jeg syntes det var for mye inkonsistens i systemet. (Det virket "ulogisk")	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	1	2	3	4	5	
7. Jeg vil anta at folk flest kan lære seg dette systemet veldig raskt.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	1	2	3	4	5	
8. Jeg synes systemet var veldig vanskelig å bruke.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	1	2	3	4	5	
9. Jeg følte meg sikker da jeg brukte systemet.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	1	2	3	4	5	
10. Jeg trenger å lære meg mye før jeg kan komme i gang med å bruke dette systemet på egen hånd.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	1	2	3	4	5	

*System Usability Scale. Norsk oversettelse ved Dag Svanes, NTNU*

## **Appendix H: Test data**

- **Usability test results**
- **Usability test - SUS data**
- **Experimental design - SUS data, prototype**
- **Experimental design - SUS data, ub.uio.no**

# Test subject #1

## About

Age	27
Gender	Male
Student	Yes
	Studying Informatics
Owns a smart phone	No
	Have tried surfing the web on a smart phone, and are some what comfortable with it
Owns a computer	Yes
	Uses it to surf the web, buy tickets, books etc. online, and for net banking

## Task completion

### Task one

Not included in this test. The app is presented to the user right away.

### Task two

The test user swiftly closes the dialog box explaining the “Librarian, help me function!”, and continues the task. Due to the open ended wording of the task, the user starts looking for some way to search for books and other literature. Then he checks out the map function. After some guidance, the subject navigates to the “Librarian, help me function!”. He expands the help box, and continues to book a librarian. He gets confused by the select box for selecting a time slot, and seems to think this is the button for booking the librarian. With some more guidance, he selects the “Now” time slot, and books a librarian.

### Task three

The test user navigates to the “Book a group room”-page, and starts off by selecting a timeslot. He still finds the selecting of time to book the group room a bit confusing. He also asks if it is possible to select a duration. After some discussion, he books a group room, and finishes the

task.

### **Concluding remarks**

The test user gets a bit confused by the select boxes for selecting the preferred time of booking. It might be that he isn't used to how android represents select boxes, and also the submit button look very similar to the select box (We made some changes here for the second session).

We also discussed that it might be a good idea to indicate for how long you are booking a group room, and other issues regarding the time and duration of the booking features.

## **Post test interview**

1. **Do you have any thoughts or suggestions about the app in general?**  
When I click on something, the things I expect to happen, happens.
2. **Have you heard about the “Librarian, help me!” service before?**  
Yes
  - a. **Did you understand the purpose of the “Librarian help, me!” function?**  
<Not included in this session>
  - b. **Did you notice the box explaining “Librarian, help me!” on the front page?**  
Yes, bu the text wasn't very clear.
  - c. **Did you notice the feedback, after you booked the librarian?**  
Yes
3. **Did you notice the status boxes, displaying information about available group rooms and librarians?**  
Yes
4. **Did you notice the news feed?**  
No, not very eye catching.
5. **Did you notice the unread news items on the front page?**  
No.

# Test subject #2

## About

<b>Age</b>	26
<b>Gender</b>	Male
<b>Student</b>	Yes
	Studying Informatics
<b>Owns a smart phone</b>	Yes
	Uses the phone to browse the web, download apps and is comfortable using the phone for browsing etc..
<b>Owns a computer</b>	Yes
	Surfs the web, buy tickets, books etc. and net banking.

## Task completion

### Task one

Not included in this session

### Task two

User tries to click on the status box on the front-page. Then he logs in, and proceeds to click on the news feed. He comments that the notification bar is rather small, and that he's used to having notifications in the top of the screen. After he closes the news feed, he clicks on the "Librarian, help me!"-button. First he expands the help box, and click on the link/text that says "Book a librarian now!". This is not suppose to be viewed as a link, so we point this out for the user. He then selects a time slot, and click on the book librarian button.

### Task three

The subject first checks out the map function, before he continues to the "Book a group room" function. He selects a room, and book it.

### Concluding remarks

The user pointed out that the "action buttons" were using a vague color. He also pointed out that, he wouldn't book a group room if he was alone, in respect to the task he was given. Also i felt that the map for selecting the group rooms were a bit small, and it could be hard to select

the correct room.

## Post test interview

1. **Do you have any thoughts or suggestions about the app in general?**  
The info boxes are very similar to the buttons. Prefers notifications in the top. Unclear wording in the dialog box about the “Librarian, help me function!”.
2. **Have you heard about the “Librarian, help me!” service before?**  
No.
  - a. **Did you understand the purpose of the “Librarian help, me!” function?**  
Yes
  - b. **Did you notice the box explaining “Librarian, help me!” on the front page?**  
Yes
  - c. **Did you notice the feedback, after you booked the librarian?**  
Yes
3. **Did you notice the status boxes, displaying information about available group rooms and librarians?**  
Yes
4. **Did you notice the news feed?**  
Yes, noticed the unread awareness que.
5. **Did you notice the unread news items on the front page?**  
Yes.

# Test subject #3

## About

Age	22
Gender	Male
Student	Yes
	Economics (Samfunnsøkonomi)
Owns a smart phone	Old touch phone.
	Doesn't use his phone for surfing, but has tested others smart phones on the web etc.
Owns a computer	Yes
	Surfs the web, buy tickets, books etc. online and uses net banking.

## Task completion

### Task one

Opens the browser and looks at the app.

### Task two

The user logs in, and proceeds to the "Librarian, help me!" page. And easily books and librarian.

### Task three

The subject navigates to the "Book a group room" page. First he tries to select a room. He get a little bit confused since another room than the one he selected gets marked (This is due to limited functionality in the prototype). He also comments that it might be hard for people with large fingers to select the correct group room. He then continues to book the group room.

### Concluding remarks

The test user seems to handle the app pretty well, and finishes the tasks rather quickly.



## Post test interview

1. **Do you have any thoughts or suggestions about the app in general?**  
The feedback is a bit vague. I'm not sure where I'm going to meet the librarian I have booked. The map for selecting group room, is a bit small.
2. **Have you heard about the "Librarian, help me!" service before?**  
No.
  - a. **Did you understand the purpose of the "Librarian help, me!" function?**  
Yes, but I think I'd rather asked the librarians directly if I already was present at the library.
  - b. **Did you notice the box explaining "Librarian, help me!" on the front page?**  
Yes, but didn't read it.
  - c. **Did you notice the feedback, after you booked the librarian?**  
Yes.
3. **Did you notice the status boxes, displaying information about available group rooms and librarians?**  
Yes
4. **Did you notice the news feed?**  
Yes.
5. **Did you notice the unread news items on the front page?**  
Yes, but I think it might be a bit annoying.

# Test subject #4

## About

Age	28
Gender	Male
Student	Yes
	Studying Informatics
Owns a smart phone	No
	Have little experience with browsing the web with handheld devices.
Owns a computer	Yes
	Uses the computer to surf the web and buy tickets etc. online. Do not use net banking.

## Task completion

### Task one

Completes task with some guidance. Have not used smart phones before.

### Task two

The user logs in, and then tries to click on the status box to get a librarian. He seems to mistake the status box for clickable links. With some guidance, he clicks on the "Librarian, help me!" button. First he tries to click the text that says "Book a librarian now!" in the help box. We point out that this isn't a link. He then proceeds to use the booking button. Due to issues with the wireless network, the button doesn't respond right away. But in the end he manages to book a librarian.

### Task three

The user navigates from the librarian page, and enters the "Book a group room page" page. He selects a group room, and books it. Again we experience problems with the wireless network. There seems to be bad reception in the area we are conducting our tests.

## Post test interview

1. **Do you have any thoughts or suggestions about the app in general?**  
The app seem intuitive and ok.
2. **Have you heard about the “Librarian, help me!” service before?**  
No.
  - a. **Did you understand the purpose of the “Librarian help, me!” function?**  
Yes
  - b. **Did you notice the box explaining “Librarian, help me!” on the front page?**  
Yes.
  - c. **Did you notice the feedback, after you booked the librarian?**  
Yes.
3. **Did you notice the status boxes, displaying information about available group rooms and librarians?**  
Yes
4. **Did you notice the news feed?**  
No.
5. **Did you notice the unread news items on the front page?**  
No.

# Test subject #5

## About

Age	24
Gender	Male
Student	Yes
	Studies math and physics + Ped.
Owns a smart phone	No
	Have very little experience with smart phones
Owns a computer	Yes
	Uses the computer to surf the web, order tickets and other stuff from Ebay etc. + Net banking

## Task completion

### Task one

Due to the user limited knowledge of smart phones, we provided some guidance on how to open the browser.

### Task two

The user easily logs in and manage to find the “Librarian, help me!” function straight away. He notices the status box, and that there are 3 available librarians. Then he proceeds to book a librarian. At first, he tries click the select box for time. It seems like he thinks this is a button for booking the librarian now. After selecting the “Now” time slot, he clicks the submit button. Due to a slow network, the button doesn’t respond at first, but after a few tries, he get the feedback dialog confirming his booking.

### Task three

The subject navigates to the “Book a group room” page. He selects his preferred time, and comments that it looks just like the previous booking page (librarian). He tries to book the group room, but faces some difficulties due to the previous mentioned problems with the wireless network.

### **Concluding remarks**

The user doesn't select a group room when he's booking one. This raises the interesting question if it should be mandatory to select a room first. Maybe you can be assigned randomly to a available room if you don't select one.

## **Post test interview**

1. **Do you have any thoughts or suggestions about the app in general?**  
Seems basic and easy to use.
  
2. **Have you heard about the "Librarian, help me!" service before?**  
No, have not used the library much at all.
  - a. **Did you understand the purpose of the "Librarian help, me!" function?**  
Yes.
  
  - b. **Did you notice the box explaining "Librarian, help me!" on the front page?**  
Yes.
  
  - c. **Did you notice the feedback, after you booked the librarian?**  
Yes, skimmed/scanned through it.
  
3. **Did you notice the status boxes, displaying information about available group rooms and librarians?**  
Yes
  
4. **Did you notice the news feed?**  
No.
  
5. **Did you notice the unread news items on the front page?**  
No.

Timestamp	I think that I would like to use this system frequently:	I found the system unnecessarily complex:	I thought the system was easy to use:	I think that I would need the support of a technical person to be able to use this system:	I found the various functions in this system were well integrated:	I thought there was too much inconsistency in this system:	I would imagine that most people would learn to use this system very quickly:	I found the system very cumbersome to use:	I felt very confident using the system:	I needed to learn a lot of things before I could get going with this system:
11/24/2011 15:30:57	5	3	4	1	4	2	4	2	4	2
11/24/2011 15:32:50	4	2	3	1	3	2	5	2	3	1
11/24/2011 15:37:32	2	1	4	1	4	2	4	1	4	1
11/24/2011 15:38:50	4	1	4	1	4	2	4	1	3	2
11/24/2011 15:39:31	4	1	5	1	4	1	4	1	5	2

Timestamp	I think that I would like to use this system frequently:	I found the system unnecessarily complex:	I thought the system was easy to use:	I think that I would need the support of a technical person to be able to use this system:	I found the various functions in this system were well integrated:	I thought there was too much inconsistency in this system:	I would imagine that most people would learn to use this system very quickly:	I found the system very cumbersome to use:	I felt very confident using the system:	I needed to learn a lot of things before I could get going with this system:
11/25/2011 15:34:10	4	1	5	1	3	2	4	1	3	1
11/25/2011 15:35:07	5	1	5	1	5	1	5	1	5	1
11/25/2011 15:36:13	3	1	5	1	4	1	4	1	3	1
11/25/2011 15:36:54	3	1	4	1	4	1	5	1	4	1
11/25/2011 15:38:00	4	1	4	1	2	2	2	1	2	1

Timestamp	I think that I would like to use this system frequently:	I found the system unnecessarily complex:	I thought the system was easy to use:	I think that I would need the support of a technical person to be able to use this system:	I found the various functions in this system were well integrated:	I thought there was too much inconsistency in this system:	I would imagine that most people would learn to use this system very quickly:	I found the system very cumbersome to use:	I felt very confident using the system:	I needed to learn a lot of things before I could get going with this system:
11/25/2011 15:28:24	3	2	3	1	4	1	5	1	4	1
11/25/2011 15:29:10	1	4	3	1	3	3	3	1	3	3
11/25/2011 15:30:39	2	3	4	1	4	2	4	2	3	1
11/25/2011 15:31:18	3	1	5	1	5	1	5	1	5	1
11/25/2011 15:32:01	2	2	4	1	3	3	3	3	3	1