Social Media Volunteering Application

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Summary (English)

This thesis is aiming at proposing a new way to promote volunteering work and a new way of helping people by increasing the amount of volunteering work that is carried out. This thesis will documents the design of a concept that engages people to volunteer and socially commit. The project is centered on a mobile web application that facilitates a task sharing system for volunteer work. The project includes the development and testing of a prototype application. The thesis starts out by giving motivation for creating the application and discusses the problems relating to creating such an application. The next chapter discusses similar existing projects and explains what can be learned from these projects. The next three chapters explain the design of the system: The abstract features of the application, the actual technology choices for implementation, the actual implementation of a prototype application. The next two chapter documents how the system has been tested and how the system works from the user perspective. The last chapter explains the necessary future work to improve and finish the application.

In conclusion the thesis motivates that the proposed idea for a new application is valid. The thesis documents a design for such an application on an abstract level and on a practical level. The thesis documents a workable prototype application. The thesis raises the issue that it is problematic but essential to make the application spread virally.

Summary (Danish)

Denne afhandling sigter mod at foreslå en ny måde at fremme frivilligt arbejde på og en ny måde at hjælpe folk ved at øge mængden af frivilligt arbejde, der udføres. Denne afhandling vil dokumenter udformningen af et koncept, der engagerer folk til at være frivillige og socialt engagerede. Projektet er centreret omkring en mobil web applikation, der faciliteter et opgave delings system for frivilligt arbejde. Projektet omfatter udvikling og afprøvning af en prototype applikation.

Den afhandling starter med at motivere skabelsen af en sådan applikationen og diskuterer problemerne vedrørende applikationen. Det næste kapitel diskuterer lignende projekter og forklarer, hvad der kan læres fra dem. De næste tre kapitler forklarer udformningen af applikationen: de påkrævede funktioner i applikationen, de faktiske valg af teknologier til applikationen, den faktiske implementering af en prototype applikation. De næste to Kapitler dokumenterer, hvordan systemet er blevet testet, og hvordan systemet fungerer fra brugerens synspunkt. Det sidste kapitel forklarer det nødvendige fremtidige arbejde for at forbedre og færdigøre applikationen.

Afhandlingen motiverer, at den forslåede idé til en ny og anderledes applikation er valid. Afhandlingen dokumenterer et design for en sådan applikation på et abstrakt plan og på et praktiske plan. Afhandlingen dokumenterer en funktionel prototype applikation. Afhandlingen rejser bekymringen, at det er problematisk, men essentiel at få applikationen til at spredes viralt.

Preface

This thesis was prepared at the department of Applied Mathematics and Computer Science at the Technical University of Denmark in fulfillment of the requirements for acquiring a M.Sc. in Digital Media Engineering.

The thesis supervisor was Nicola Dragoni, Department of Applied Mathematics and Computer Science, Technical University of Denmark.

Kongens Lyngby, Marts 2013 Christen Gjølbye Christensen

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Chapter 1

Introduction

1.1 Motivation

This thesis is aiming at proposing a new way to promote volunteering work and a new way of helping people by increasing the amount of volunteering work that is carried out. This is important because volunteering work is beneficial to everyone. The people receiving the help gains from it, the people doing the work gains from it. It seems though that the volunteering society in Denmark has not yet harvested the potential benefits that technology can offer the volunteering sector. This thesis proposes a system that will motivate people to do more volunteer work, make it easier for people to carry out the work, let people find relevant work and let people see the impact of the work.

Inspiration
The project has a starting point in the concepts of mobile Volunteerism [1] and micro volunteering [2]. Both concepts are about how to engage people in volunteering. Mobile volunteering is about engaging people through their mobile phones. Micro volunteering is about engaging people by giving them manageable tasks that can be solved in a relatively short time without the need for long term commitment.

This thesis will explain how to design a concept that engages people to volunteer

and socially commit. The project will be centered on a mobile web application that facilitates a task sharing system for volunteer work tasks. The project will include the development and testing of the application.

Mobile Web Application
The application has two main functions, letting people create a task they need help with (receive help) and letting people find a task to solve (offer help). Tasks examples: Getting a volunteer visitor on Christmas Evening; escorting a blind person to work on a particular day; helping a friend to paint. The mobile application must be able to give people the opportunity to help when they desire. In addition, it must also allow people to receive help when they need it. In general it must make it easier for people to volunteer.

It will be a central part of the app that it is integrated with Facebook so that you can create a bigger audience for the application. This will make it possible to exploit the social network to create awareness about the application and tasks that needs to be solved. It is also be crucial that the app is a mobile web app that works across platforms, so everyone can use it. It is important that it can be accessed from mobile devices so the users can be informed on the fly about tasks and make decisions to help others when the opportunity arises.

Similar Projects
Partly Similar project exist in other parts of the world but has not yet surfaced in Denmark. The app should be aimed at the Danish market and offer the Danish population new opportunities. There are many people in Denmark in need of a helping hand. [3], [4] Also a lot of people can gain from doing volunteering work. In general volunteering work is on the rise in Denmark. [5] This means a large population of potential users exist.

It has previously been explorer how mobile social software can assist volunteering work [6]. The main points from the article will be repeated below. These points motivates the idea of a mobile volunteering app. These points should be taken into consideration when designing the system.

- "..mobile devices are usually carried throughout the day, they have the potential to intervene at the ideal moment, based on the users location, activity, or routines.."
- "..mobile devices are capable of tracking the users activities, and can provide helpful and motivating feedback. This is exemplified by systems such as UbiFit Garden.."
- "..the connected nature of most mobile devices could enable users to share their goals and progress with friends, family, and peers. This peer feedback

can act to motivate users.."

- "..To be successful, this application must provide appropriate, useful, and actionable information without overwhelming the user.."
- "Technology that matches a volunteer with jobs relevant to their interests or skills would increase the likelihood that the volunteer will be interested in the job, and may increase the likelihood that the volunteer has relevant experience. A mobile application might therefore ask a user to complete a volunteer profile, or might learn a users preferences based on past volunteer work."
- "..A mobile device application might be used to set goals and display progress toward them. An application might also provide feedback about peers activities, or show information about the beneficial effects of the work.."
- "Technology can decrease costs to volunteers in several ways. A mobile device might notify a potential volunteer about a volunteering opportunity near her home, workplace, or along her commute route. In some cases, a system might assign tasks that can be performed over the phone or over the Internet to users who could not otherwise participate.."
- "Technology that allows users to share information about their volunteering activities with friends may encourage others to get involved. Tracking users skills and prior experience might also help them connect with organizations that can use their expertise."
- "..a system that maintained an electronic record of volunteering activities would be beneficial to those users who wished to share their volunteering experience with potential employers.."

1.2 Project Goals

This section consist of three parts. First part outlines the goals for this Project and for the application. The second part adds some constrains to the goals. The third part summaries the actions that must be completed during the project.

Project Goals
The project aims at accomplishing to design an application which:

- Can aid in pairing people who need help and people who want to help.
- Is accessible on many platforms (pcs, tablets and mobiles). Accessible on new and old devices. This gives the application the potential to spread virally among all layers of society. So it can help all people and get help from all people.
- Is linked to Facebook. Being linked to Facebook let the application tag into an existing source of users. Which helps the application to spread virally.
- Makes it easy to offer and receive help by offering an agile system. Allowing people to help when they want to and allow people to revive help when needed. The application must record the time and place for the tasks created by the users. Allowing helpers to search for tasks at a specific location in time and place. The application should be accessible from the device that a user has available to them right now, especially mobiles.
- Is autonomous. Where the help reaches the places where it is needed with as little delay as possible. The application should be designed in a way that allow for the processes to work without an organization that schedules the help.
- Is easy to use. The barriers for using the application should be as low as possible. Almost everyone should be able to use it. Whether they are tech savvy or not. Whether they have the newest devices or not.
- Minimizes the user's effort so everyone can be bothered to use the application frequently. It can't take up to much time, it can't be too complicated.
- Is open to all people who wishes to volunteer. The application can't be controlled by a single cause or organization. It should be available to help with as many causes as possible.

Constrains

In an attempt to make this thesis as complete and exciting as possible. It has been decided to make a project where the application is implemented and tested by users. This will show how the idea actually functions in real life. An important goal is to get the application implemented in time for users to test it. This means that the application will be a prototype.

Since the application will be tested by real users the focus of the implementation will be to give the users an experience which would be similar to a fully developed application. The prototype app must

- Have some central functions implemented and working.
- Be accessible to as many users as possible to get test users.
- Be visually appealing and credible for people to want to use it.
- Be easy to access and use.

Data must be gathered from the test users to learn what is good and bad about the application and the concept. The application must be able to gather information about the usage of the application. Information about

- How the application is used and what functions are used.
- How the application is being distributed between people.
- How frequent people are using the application.

Summary of Needed Actions

The following actions must be completed in order to solve the goals stated above.

- Review existing projects.
- Design an application.
- Build a prototype application with a client and a server side.
- Distribute application to test users.
- Gather info about the usage of the application.
- Analyze the data gathered to the extent possible.
- Explain the process and results.

1.3 Thesis Structure

After the introduction in chapter 1. The report consist the following chapters.

Chapter 2 - Problem
Discusses the various challenges and considerations related to the project.

Chapter 3 - Review of Similar Projects
Reviews similar and relevant projects. Summaries what can be learned. Justifies why a new application is needed.

Chapter 4 - App Design
Explains the overall design of the application. Explains which design choices have been taken to fulfill the goals stated.

Chapter 5 - Technologies for App
Explains why the specific technologies have been chosen for this project. Lists possible alternative technologies.

Chapter 6 - Implementation of App
Gives an overview of the implementation and explains how the application has been implemented.

Chapter 7 - Test of App
Documents the tests which have been conducted to learn how well the application functions.

Chapter 8 - App User Guide
A user guide that explains all the main functions of the application.

Chapter 9 - Future Work
Summaries the possible improvements to the application and the project.

Chapter 10 - Conclusion
Compares the results obtained with the stated goals.

1.4 Vocabulary

Shorthands:

- **App**: Application.
- **FB:** Facebook.
- **OS:** Operating System.
- **IE:** Internet Explorer.

Project Terms

- **Task:** A task is something a user of the application can create in order to receive help from other user to solve the task. Money can't be involved in getting the task solved, the task solving time can vary from a few minutes to a couple of hours. The task should if possible be described with a time and a place where the task is executed.
- **Help point:** Is created by a user to offer a service to other users. The service must be free and the service should preferably be description with a time and a location. It allows Users a user to offer his own resources to other users. This might include skills, food, shelter etc.
- **Project:** A project is a container which can include many tasks. A project offer a way for organization to organize and keep track of several tasks which are related to one another.
- **Item:** In general a task, help point or project is referred to as an item. An item i simply a general term covering any one of the specific categories.
- **Organization:** Is a special type of profile that offers it users other possibilities than a normal user profile. It is intended to be used by organization. It will enable the organization to link to their homepage and associate organization worker user profiles with the organization.
- **Helper:** It is a normal user of the app that is currently helping another user. The helper can be helping another user with a task or offering help by a help point.
- **Beneficiary:** It is a normal user of the app that is currently receiving help from another user. This user might be receiving help with a task that the user has created.

Technical Terms:

- **UI:** User interface.
- **iOS:** Operating system used on all Apples iPhone mobiles.

- **HTML5:** Is a markup language for structuring and presenting content for the World Wide Web and a core technology of the Internet. ([7])
- **jQuery:** Is a fast, small, and feature-rich JavaScript library. It makes things like HTML document traversal and manipulation, event handling, animation, and Ajax much simpler with an easy-to-use API that works across a multitude of browsers. /[8])
- **CSS:** Cascading Style Sheets (CSS) is a style sheet language used for describing the presentation semantics (the look and formatting) of a document written in a markup language. It's most common application is to style web pages written in HTML and XHTM. ([7])
- **Geolocation:** Refers to the HTML5 Geolocation API that is used to get the geographical position of the user.
- **jQuery Mobile:** A unified, HTML5-based user interface system for all popular mobile device platforms, built on the rock-solid jQuery and jQuery UI foundation. ([9])
- **jQuery UI:** jQuery UI is a set of user interface interactions, effects, widgets, and themes built on top of the jQuery JavaScript Library. It is similar to jQuery mobile but it is only intended for web application used on normal pcs.
- **Mobile Web App:** Is a homepage which can adopt to different devices and imitate the look of a native app.
- **PHP:** Is an open-source server-side scripting language designed for Web development to produce dynamic Web pages. ([7])
- **MySQL:** Is the world's most used open source relational database management system as of 2008 that runs as a server providing multi-user access to a number of databases. ([7])
- **MyISAM:** A MySQL database table system.
- **Snippet:** A short reusable piece of computer source code. ([7])
- **API:** An application programming interface (API) is a protocol intended to be used as an interface by software components to communicate with each other. An API is a library that may include specification for routines, data structures, object classes, and variables. ([7])
- **SDK:** A software development kit (SDK or "devkit") is typically a set of software development tools that allows for the creation of applications for a certain software package, software framework, hardware platform, computer system, video game console, operating system, or similar development platform. ([7])
- **Micro Volunteering:** Describes a task done by a volunteer, or a team of volunteers, without payment, either online via an internet-connected device, including smartphones, or offline in small increments of time, usually to benefit a nonprofit organization, charitable organization, or non-governmental organization. Micro-volunteering is a form of virtual volunteering. It typically does not require an application process, screening or training period, takes only minutes or a few hours to complete, and does

not require an ongoing commitment by the volunteer. ([7])
- **Mobile Volunteering:** Is about engaging people in volunteering work through the use of peoples mobile phones.
- **Responsive Design:** Responsive web design (often abbreviated to RWD) is a web design approach aimed at crafting sites to provide an optimal viewing experience— easy reading and navigation with a minimum of resizing, panning, and scrolling—across a wide range of devices (from desktop computer monitors to mobile phones). ([7])
- **Quirks Mode:** In computing, quirks mode refers to a technique used by some web browsers for the sake of maintaining backward compatibility with web pages designed for older browsers, instead of strictly complying with W3C and IETF standards in standards mode. ([7])

Other Terms:

- **Slacktivism:** Is a portmanteau of the words slacker and activism. The word is usually considered a pejorative term that describes "feel-good" measures, in support of an issue or social cause, that have little or no practical effect other than to make the person doing it feel some amount of satisfaction. The acts tend to require minimal personal effort from the slacktivist. ([7])
- **Gamification:** Is the use of game-thinking and game mechanics in a non-game context in order to engage users and solve problems. ([7])
- **Mashup:** A web application that combines data and/or functionality from more than one source. ([7])

Chapter 2

Considerations for a Volunteering Application

This chapter discusses the challenges and ideas related to this project. Especially the problems related to creating a mobile web application which can reach the goals described in the introduction.

The first two sections of this chapter compares traditional volunteering and micro volunteering with the proposed new way of managing volunteer work. This shows what the perceived benefits are of managing volunteer work in a new way. The new way of managing volunteer work is a hybrid of traditional volunteering work and micro volunteering. The third section documents the motivational factors of volunteers and discusses how to motivate the potential volunteers with an app. The fourth and fifth section discusses the challenges around self regulation, privacy and security in the app. The sixth chapter discusses how to make the app available to as many people as possible and documents relevant statistics.

2.1 Problems With Traditional Volunteering

In traditional volunteering work individual organizations represents different causes. The individual organization then cake care of acquiring volunteers for their own cause. The organization have to find volunteers, hire them, train them, supervise their work and satisfy their needs. All this is necessary to have the volunteer's resources available to the organization.

In addition to managing the volunteers the organizing must also take care of the administrative work of running an organization. Doing so cost money and takes up time. In general the organization will take up a lot of resources to fulfill its tasks. In general an organization will have a lot of overhead costs associated with helping their cause.

- The organization might have office space available to them 24/7. Which might not be needed.
- They might have full time employees to take care of traditional work which can't be solved by volunteers.
- They have to do promotion to let the world know that they exist.
- They have to manage volunteering staff.
- They have to do fund raising.

Problems Associated With Traditional Volunteering
The problem with this situation is that a little organization can take up a lot of resources to solve their individual cause. Especially if you include the hours spent by the volunteers.

Even though the organization does everything in their power to help their cause. They still have limitations due to funding, available workforce etc. So the people being helped might not even get the optimal service. Due to opening hours, staff skills, tools available etc.

The question is, how can this process be optimized? You still want the volunteers to have the same benefits and you still want society to gain from the service which is offered. Just without the overhead cost. In optimizing the process you might even be able to give the beneficiaries a better service.

The traditional volunteering method is very rigid. It consist of all the factors and processes explained above. What if the volunteers and the beneficiaries could solve the problems directly without an overhead organization?

A New Way of Organizing Volunteering

These two examples illustrate how a mobile application could make volunteering work more efficient.

- Feeding homeless and hungry people:
  Today:
  An organization has to rent rooms, buy food and acquire staff to serve food for the homeless. The homeless has to show up a specific times at specific places to get the food. All in all a rigid way of doing things. Work like this is especially happening in the winter months.

  New alternative:
  Citizens invites homeless to come and get food from their own kitchen. If enough people do this. The homeless will have food offerings close to them at all times. The people volunteering will be able to offer the service without doing much more than they would have done ordinarily. The overhead costs have now been minimized, the service level has risen.

- Lonely people who need someone to talk with:
  Today:
  An organizations hires volunteers to talk to lonely people. The schedule the meetings. They supervise the volunteers. They promote their specific cause. Work like this is especially centered on Christmas.

  New alternative:
  Volunteers talk to lonely people either by visiting them or by inviting them to their own home or by meeting at a public place. The lonely person can get help when they need it and not at a specific time and place. The volunteer can help when they have time and choose to help people that they relate to.

Section Summary
Changes introduced by organizing volunteering work with an app:

- You trust people to carry out the work by them self.
- You let people choose who they want to help and who they want to receive help from.
- The work is mostly administrated by a technical platform and individuals instead of a organization.
- You don't need an organization to administrate the volunteer or the beneficiary.

Improvements gained from doing things a new way:

- Volunteers can help in the ways which are possible to them.
- Volunteers can make the most of the time they have available.
- The beneficiaries can get help when it is needed.
- The technical platform can serve many different causes not only one.
- The overhead cost in terms of money and time are brought down. Meaning more resources for the cause.

2.2 Micro volunteering Challenges

This sections documents the problems with micro volunteering and suggest how the proposed application can avoid these problems.

Micro volunteering can be seen as an opposition to traditional volunteering. Micro volunteering bring the hope of engaging more and different people in volunteering work, aiding people in doing more volunteering work by making it easy. Micro volunteering has received some criticism.

Analysis of a Micro Volunteering Project
The report "Micro-volunteering: doing some good through smartphones" [10] analyzes a micro volunteering project (Orange: Do some good) to learn about the advantages and disadvantages of the micro volunteering concept. The project investigated is a virtual micro volunteering project. Meaning that the tasks accomplished are virtual and are accomplished on a phone instead of in the real world. The following conclusions are drawn from the report.

- Engaging the Disengaged?
  "Critically, the study has highlighted the danger of assuming that micro volunteering attracts large numbers of people who don't engage in other forms of volunteering and charitable giving, as those who participated in the survey represented an active and engaged group. This is not to say, however, that the findings totally refute claims that micro-volunteering has the potential to reach those less likely to participate in voluntary action...."

- A gateway to further participation?
  "...the findings do raise the need to be careful in overstating and assuming that involvement in micro-volunteering will automatically result in increased participation in other forms of giving."

- Complementing not replacing wider volunteering
  "...the data suggest that most participants perceived wider volunteering as providing a valuable role which micro-volunteering is unable to fulfill. In this way, rather than replacing wider volunteering, it could be said that micro-volunteering will complement other forms of engagement..."

- Motivations to micro-volunteer
  "The majority of participants conceived the value and role of micro-volunteering not so much in terms of the outcomes for themselves or beneficiaries but the convenience of the activity and opportunity to occupy a short period of time..."

- Managing and retaining micro-volunteers
  "...This possibly highlights the need for micro-opportunities to be designed and targeted in different ways to wider volunteering if organizations are hoping to ensure that they facilitate the continual and meaningful involvement of volunteers. Here it could be argued that a greater emphasis should be placed on the activity, creating new and different actions that are easy and quick to complete and potentially feed into peoples values and interests."

- The possibilities and limitations of smartphones
  "The most common way of hearing about the App (via Orange) possibly indicates the effectiveness of the internet in providing a direct avenue to a large group of people and facilitating a quick and convenient route to participation. While such processes offer many possibilities, they also carry potential limitations. Namely, participation is limited to those with smartphones, narrowing the pool of possible volunteers. In this way, while micro-volunteering through internet-connected devices has the potential to reach those who do not engage in other forms of participation, at the same time it also has the effect of potentially excluding those who don't have the access to the necessary tools."

Section Summary
The report raises the following consideration in relation to designing an app which is based around micro volunteering.

- The concept should leverage the hope of creating a platform that actually reaches a wider group than the traditional volunteering group.

- This concept is not about virtual volunteering so therefore real interaction and real change is the purpose of the app. Which means all criticism surrounding slactivism etc. is not relevant. This project will create volunteers who engage in real volunteering that is helping people.

- The concern about not reaching a new group of volunteers just because you engage people through their mobiles should be taken seriously. Meaning two thing. The concept should focus on the main group of people who will likely be using it, the existing volunteers. The concept should do as much as possible to take in new people with no experience in volunteering.

- The main motivational factor of micro volunteering is that people find it easy to help. People expect it to be fast, easy and not cost them to much time, money or effort. The app should allow people to help in an easy way.

- The other motivational factors of the potential volunteers should also be taken into account. Meaning that the concept should be wide enough to involve people with different interest and different motivation. Allowing for people to solve a wide variety of tasks and helping out in a variety of ways.
- The report also points out that not everyone has a smartphone. This is true at the moment but in the near future everyone will probably own a smartphone. This means two things. The concept should be designed for today allowing people to engage through computers, but the design should also be designed for the future. Leveraging all the potential advantages of smartphones.

2.3 Motivating the Potential Volunteers

This chapter discusses the motivational factors that lead people to volunteer. Getting people to volunteer is challenging. You need to get people interested and you need people to stay interested.

Motivational Factors
This article "The motivations to volunteer: Theoretical and practical considerations." [11] has researched the common motivational factors that lead people to commit to volunteering work.

Figure 2.1 is from the article. It shows the motivational factors (Volunteer Functions Inventory). It serves in understanding how to motivate people to volunteer. This is important to get people to start using the proposed app and to keep people using the app.

Table 1. *Functions served by volunteering and their assessment on the Volunteer Functions Inventory (VFI)*

Function	Conceptual definition	Sample VFI item
Values	The individual volunteers in order to express or act on important values like humanitarianism.	I feel it is important to help others.
Understanding	The volunteer is seeking to learn more about the world or exercise skills that are often unused.	Volunteering lets me learn through direct, hands-on experience.
Enhancement	One can grow and develop psychologically through volunteer activities.	Volunteering makes me feel better about myself.
Career	The volunteer has the goal of gaining career-related experience through volunteering.	Volunteering can help me to get my foot in the door at a place where I would like to work.
Social	Volunteering allows an individual to strengthen his or her social relationships.	People I know share an interest in community service.
Protective	The individual uses volunteering to reduce negative feelings, such as guilt, or to address personal problems.	Volunteering is a good escape from my own troubles.

Figure 2.1: motivational factors

The six factors in figure 2.1 are ordered by how important they in general are to people, but the priority can be different for each individual volunteer. Among other the motives change with age. A volunteer normally have two or three motives some altruistic some egoistic. To successfully motivate a person to engage in volunteering work. The work most match the person's motivational factors.

The article also reports that volunteers whose motivational factors are meet will keep volunteering and contribution over a long time. The article finds that people who are forced to do mandatory volunteering work will also quit it soon after the mandatory period is over. These two findings spells out the fact that the only way to keep people volunteering is by keeping them satisfied and this is done by serving their motivational factors. Therefore emphasis should be on matching the volunteering work with a person's individual motivation.

App Support for Motivational Factors
The app can support these six motivational factors in the following manor.

- How can the application serve a volunteers personal values? The app must learn the values of the volunteer and then present appropriate tasks to the volunteer. The values can be learned either though a questionnaire that the user fills in or though examining the tasks which the user looks at.

- How can the application help the volunteer in understanding specific subjects? Different users will have very different needs for subjects to understand. The task of the application is to learn these subjects and serve the user with tasks related to the subjects. Therefore the user should have the possibility to wish for new type of tasks that fits the user.

- How to help the user in enhancing and learning though the tasks? This problem consist of two parts. One is to actually help the user in learning by solving tasks. This is done by supporting the user with advice and feedback. This can be general articles etc. or specific feedback from other users. The other part is to give the user positive feedback like list of the things he has accomplished: people helped, tasks solved, skills used.

- How to help the user gaining career related experience though the work? The user should be provided with relevant work and with many diverse opportunities to help. The user should be provided with a history of his volunteering work. Like hours spent, tasks solved, types of work accomplished. This information should also be distilled into a diploma. Which the user can acquire at any time. The diploma can also include feedback/recommendations from other users.

- How to help the user strengthening his social relations? The users will automatically be connected to beneficiaries, organizations and other volunteers by using the applications. The user will meet these people though the work. Users should also be able to show up to events specific to people using the application. Users should be able to meet users similar to them self, people with same values. This can be done by learning people's values though their profile and then present user to other similar users.
- How to help user that uses volunteering work to reduce/forget personal problems? The app in online 24 hours. Therefore the volunteer can always help. So the app is available when the users need to forget the feelings. In addition the app is able to show a history of the good deeds the user has previously done.

Section Summary
The app should contain the follow general attributes in order to motivate the users to volunteer.

- Be smart and gather information about the user so it is able to give the the user a customized experience. This will help the user in getting the right tasks, the right feedback and meeting the right people. This will give the users a meaningful and rewarding experience.
- Show the user his progress. This can help the user to see that he is making a difference to other people, in creating a good reference chart for his career or to feel better about himself.
- Aid the user as much as possible. This will make it easier for people to get started volunteering. It will aid the volunteer in learning from the work. This can be done with general guides, articles and feedback.
- Bring people together and create bonds in the real world. Let people expand their world.

2.4 Self-Regulation

The app must contain features which allows the users and the app to be self-regulating. This is necessary to keep bad elements/people out of the system. The system should be able to work with the least possible overhead workforce therefore the system must be smart. Users must be able to report issues to the system administrators so they can solve the problems. The users must be able to warn and rate each other.

2.5 Privacy and Security

The app must accomplish that the user feels secure that their personal information and data is protected. For that reason the app must be protected by a login. Users must create an account to view some of the information in the app. It is also important that the application has a basic level of security to keep hackers away from the data. On the other hand it must be possible to share as much data as possible to attract new people to use the application. A reasonable amount of data must be accessible to the public.

To allow for both user privacy and public access it is necessary for the individual user to optionally mark data as private. The following solution is proposed.

Different Levels of Privacy

User profiles are only available to other user that are logged into the application. The application has no specific functionality to browse profiles Keeping the profiles in the background and the tasks, project etc. in focus.

All tasks, project and help points are public available. These items can be shared in other systems like Facebook. To protect the specific user the user can choose to change the privacy setting and only share items with invited users. The system should be built to promote sharing but allow for users to protect privacy.

Sensitive Information
The application must have access to the individual users sensitive info like: Address, telephone nr., Facebook account, name etc. These information must be correct to make sure that all users are real people and that the user info can be handed over to the police if a crime occurs.

On the other hand the sensitive info should not be shared with other people or users. The single user must be able to decide when to share sensitive information. The application can share info like: address, email, Facebook account etc. But it is important that the user knows and accepts that the info is shared.

2.6 Making the App Available to Everyone

It is important to make the app available to everyone. The app can be made available to everyone by developing a mobile web app. The app will run in

the browser on all smartphones and computers. The following section will investigate statistics specific to Denmark covering the distribution of computers, smartphones, browsers and OS. In order to show that it is essential to develop a mobile web app.

According to a survey from 2012 from "danmarks statestik". [12] 9 ot of 10 people have a computer. 5 out of 10 people have a smartphone. The same survey shows that the percentage of people with a smartphone has risen approx. 17% during 2011. If this trend continues almost everyone will have a smartphone within a couple of years.

A survey from dst.dk [13] shows that approx. 80% of people in the age 16-34 years have used their mobile for internet surfing. But only 18% of the people between 65-74 years have used their mobile for internet surfing.

The same survey shows a different distribution with internet usage from any device (including computers). 98% of people in the age group 16-54 year has used the internet within 3 months and in the age 65-74 year old 70% have used the internet within three months. [13]

This shows that it is critical to support both the mobile and computers. The proposed application is intended for mobiles but it must work on computers as well. The numbers support the idea of creating a mobile web application since the application will work on both smartphones and computers.

Danish Statistics for Smartphones, OS and Browser.

Mobile OS distribution: [14]

Platform	distribution
iPhone (Approx.)	25
Android (Approx.)	23
Anden Smartphone (Approx)	10.5
Nej (Approx.)	40.5
Ved ikke (Approx.)	1

Half the population currently have a smartphone. The distribution of smartphones is fragmented on different platforms. This underlines the need for an app that works on all platforms. This app will have to be tested on the different smartphones. It should be pursued that the proposed application works on iPhone and Android. Since these platforms are popular.

browser distribution: [15]

Browser	pages shown
MSIE 9.x	31.5
MSIE 8.x	14.3
Chrome 23.x 8.x	13.9
Firefox 16.x 8.x	7.7
Webkit Mobile 6.x 8.x	7.0
Chrome 22.x 8.x	5.7
Safari 6.x	4.3
Safari 5.x	3.9
Webkit Mobile 4.x	3.3
Webkit Mobile 5.x	2.8
Sum (Approx)	94.4

In Denmark the most popular browser are Internet Explorer, Chrome, Firefox and Safari. So it is necessary to support these browser to let everyone use the application. This should be considered in the design, development and testing phase. When developing a web application it is important to know which browser to support since not all functions work in all browser.

OS distribution: [16] browser distribution:

Browser	pages shown
Windows 7	50.2
Windows XP	13.2
Mac OS x	11.2
iOS	11.2
Windows Vista	9.7
Android	2.3
Windows 8	1.0
Sum (Approx)	98.8

Another parameter is the distribution on OS. This is not important for the design of the application but it can be a consideration when deciding on which OS to test the application. It can be seen that windows 7, Windows XP, Mac OS, iOS are important in the testing.

Wireless Connection Speed
The mobile web app requires the device to have a internet connection since the app must be able to connected to a database and communicate with others

users. Denmark is almost completely cover by fast internet connections. The app should be able to function in almost every area of Denmark. Even so Denmark has areas that are covered only by a slow/bad connection. Figure 2.2 below shows the wireless connections available from the network operator "3".

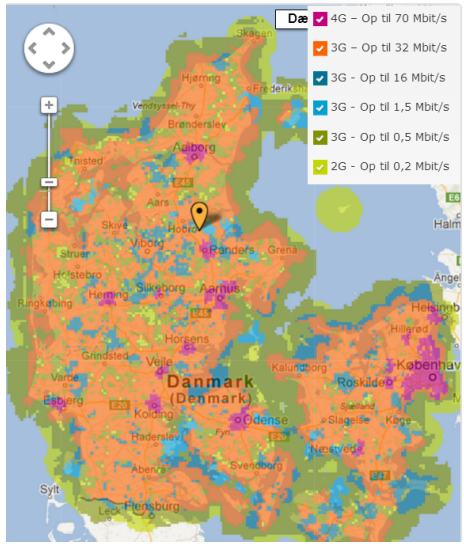

Figure 2.2: Map of 3's wireless connection map

The web app should optimally work on slow connections. The app should minimize the burden on the internet connection so people with slow connections will get an acceptable user experience.

The application will spread more virally in the cities and the app concept will work better in cities as well. Where the wireless connections are good. The app concept will not work optimal in the country side.

Section Summary
It should be possible to make the app available to most people by making it a mobile web app. The app must be developed and tested in such a way that it supports popular browsers, OS and mobiles. This is done by carefully selecting the features used. Basically the less features that app uses, the more platforms it will work on. The statistics presented in this section will give an idea of the impact it has to exclude a certain browser, device or OS.

Chapter 3

Review of Similar Projects

This section reviews existing work to gather inspiration. Which is necessary in order to create a well-designed app.

Reviewing the previous work can aid in showing how the following challenges were solved.

- How is the app made accessible to a large audience.
- Locate app features which is requested by user.
- Create a user friendly design.
- How user privacy is handled. What information is public, what is private?
- Which technical solutions has been used.
- Which audience does the app target.
- Which problems does the app aim at solving.

The following two sections discusses projects originating from Denmark and the rest of the world. The Danish projects will be considered as competitors. The foreign projects will be considered as inspirational material.

3.1 Outside Denmark

This section reviews similar project outside Denmark.

The Extraordinaries
It is a virtual volunteering project. The project features a native app for iOS that lets people solve tasks on their mobile. The tasks duration are a couple of minutes. Examples: Translate text, identify birds, tag images, transcribe texts, review bills and check facts for reporters.

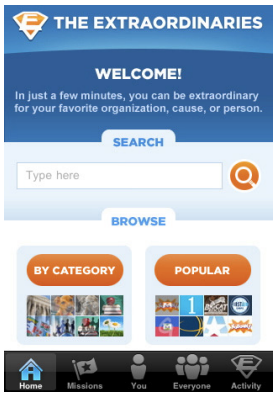

Figure 3.1: The Extraordinaries screenshot

Strengths:

- Meaningful concept.
- Good app interface design.

Weaknesses:

- People are complaining that the app is crashing.
- Isn't very widespread yet.
- Review tell that the app is not gaining much usage even though it had a lot of press. [17]

Orange - Do some good
This project is about virtual volunteering, it's a native mobile app which is available for android, iOS blackberry and Nokia. It lets people solve tasks on their mobile which takes less than 5 minutes. Example: Map a green area in the community so other people can find and enjoy it.

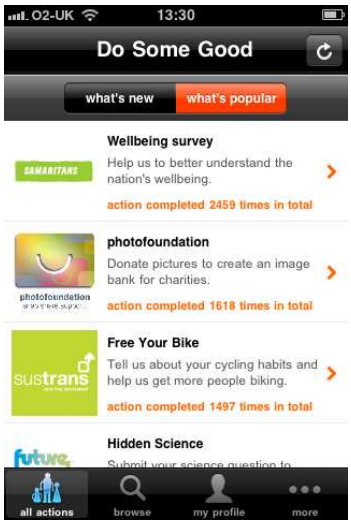

Figure 3.2: Screenshot from do some good

Strengths:

- The app that is available on most platforms as a native app.
- Its supported by a large mobile telephone company.
- Access to partner organizations. Which provide tasks.
- Awards people with real and virtual prizes.
- Has a point system for users.

Weaknesses:

- It can only do so much, since it features virtual tasks on a mobile.
- It is only for use in the UK.

Spotsoftime.org.uk/
Spots of time is a UK website which helps volunteers and organizations to meet up. It does this by offering a platform where they can meet. The organizations can create time spots where they accept help and volunteers can offer to help in those time spots with things they are good at. The site has predefined categories of thing that you can help with like: Live performance, knitting, bring peat, play games, green finger etc. Which means that everyone knows what they are engaging in. The website is built using jQuery UI.

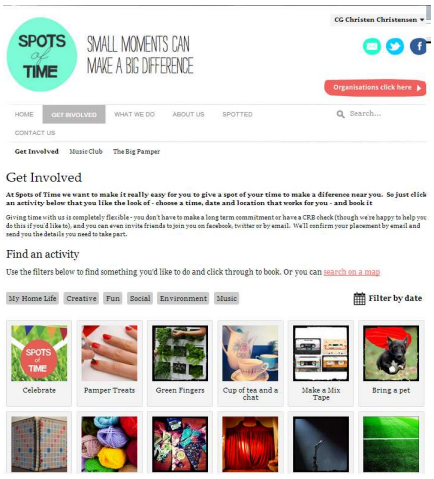

Figure 3.3: Screenshot from spot of time

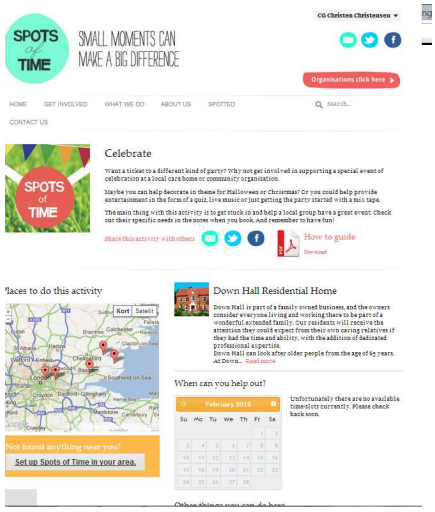

Figure 3.4: Screenshot from spot of time

Strengths:

- Event scheduling system with calendar view. Where an organization can create an event and a user can attend it. Focused on planning ahead.
- A wide variety of event types. With explanations for what the user can help out with and how.
- A well-defined target group. The project focuses on old people in care homes.
- Easy sign up procedure for organization. Tell what and when you want help and organization details. List with "help item" examples to choose from.
- Share to Facebook, Twitter etc.

- Login wit Facebook.
- They protect user security by demanding a telephone number and a person to vouch for you.

Weaknesses:

- No mobile web site or mobile app.
- Design is somewhat confusing.
- Only in the UK.
- Project only target organization as receivers of help.

Helpfromhome.org
"Help from home" is an UK based website which urges people to volunteer by doing good deeds from their own home. Example: knit a blanket and send it to an organization which needs it. The web site has a huge list of actions the user can do from home. The website doesn't actually track the individual user's actions. The website just informs the user about opportunities to help. The user can click a link and continue to other organization websites where the actual help is needed.

Review:
In general this concept is different from the concept proposed in this thesis but several things can be learned. The website is a great recourse of volunteer actions to use in this project. The website also provides the basic idea that a volunteer can help form their own home. Which is a powerful idea. It lets people volunteer with little effort.

Niceserve
"Niceserve" is a Christian project. They have made an iPhone app to attract people to aid. This app lets a user sign up for volunteering work at the nearest church. The app has three different areas available and each area has approximately three churches. The user can sign up for approximately 6 different kind of volunteer work. The work could be to clean a hospital. Aster the user has signed up, the user is contacted by someone from the church. The app is available as a native iPhone app. The app uses the action bar for navigation.

Review:
The "Niceserve" app concept is very far from the concept proposed in this thesis. The app doesn't offer the user anything which couldn't be accomplished from visiting a homage or calling a phone and agreeing to volunteer. It is not a very good app. I didn't find any useful features in this app worth copying. In many aspects this is a very poor app.

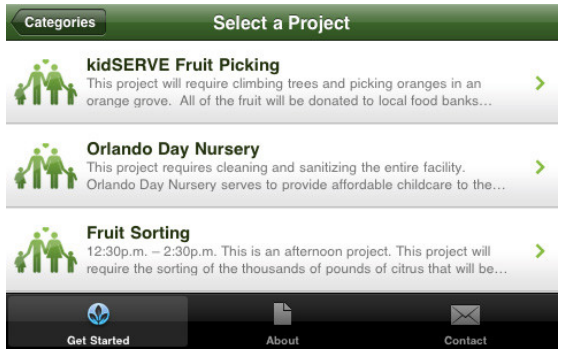

Figure 3.5: Screenshot from niceserve app

3.2 Denmark

This section reviews similar projects in Denmark.

Projekt Frivillig / Frivilligjob.dk android apps
These two apps allows you to search for a traditional volunteer work. The resulting job locations are showed on a map. The app has the following search criteria type of work, area of work and category of work. These two app is actually two identical apps that does the same but are targeted at different users. The apps are available for android. The apps has very little functionality and is not working probably on a Samsung galaxy S3 device! It seems to be an very immature project. On the up side the app is part of a big volunteering site called "frivilligjob.dk"

Figure 3.6: Find job

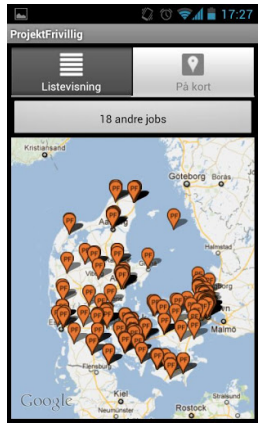

Figure 3.7: Show jobs

Figure 3.8: Apply

Strengths:

- Part of a big website which is commonly known. Website has about 1500 volunteering jobs and 30.000 monthly visitors. 800 monthly job applications [18].
- Gives user search criteria for both the type and category of volunteering work.
- User can choose between list view and map view for the search results.

- Create a certificate that shows the users volunteering commitment. It can be used in job and education situations.

Weaknesses:

- App Not working probably.
- App Only available on Android.
- Only usable for jobs with long term commitment.
- User must go through a validation process to get the job. Delays the process about a month.

Denlilletjeneste.dk
The website lets people create a task and offer an amount of money for getting the task solved. Other people can offer to help with the task. When the task is solved the task creator pays the helper though the website. The site is created with jQuery UI. The Danish website is quite similar to the service proposed in this thesis with three main differences. It's not available on mobile platforms, it not focused on being agile. It is not focused on volunteering work.

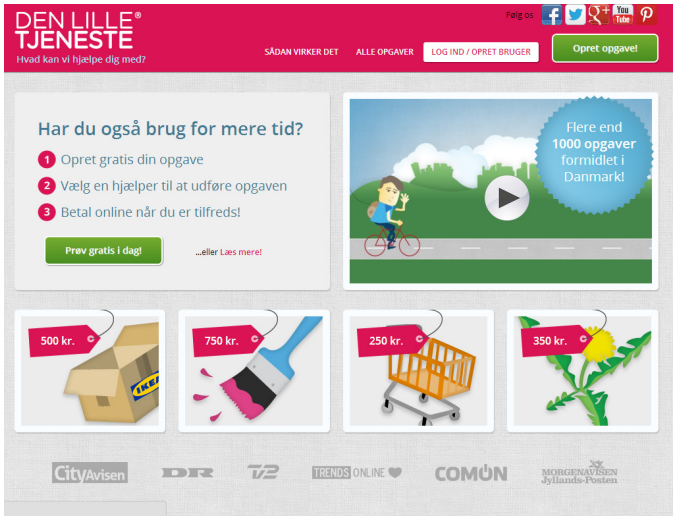

Figure 3.9: Screenshot from den lille tjeneste

Strengths:

- Nice website with clear design and good graphics.
- Offers people an incentive (money).
- The site has had some Danish press coverage.
- Has a team of entrepreneurs managing the site.
- A mature product.
- A task can be shared to Facebook in three ways, like, message and timeline post.
- Two types of login: with Facebook and without.
- The site focuses on the tasks and keep the user profiles in the background.
- Offers a possibility to distinguish between user that want to help and users who want to receive help.
- Is blogging on Facebook, twitter, Pinterest, Google+ and Youtube.
- Option to report misuse of the site (inappropriate tasks...).
- Sends out a newsletter.
- Sends reminder on email regarding tasks that expire, task are then made inactive, another email is sent offering people to activate the task again.
- Tasks are public and the front page has an inventory of the task categories.

Weaknesses:

- Only available to use on a pc.
- Centered around money and getting paid for a service.
- Does not have more than 20 active tasks available on the search site.
- It is not possible to remove your help when it has been offered.
- Not possible to upload pictures for tasks.
- In general it seems like the site could be more feature rich.

Tagdel.dk
This concept has not yet launched. Therefore a full review is not impossible. The concept is somewhat similar to the proposed concept. Tagdel focus is to engage people in society. Tagdel has two main features: It lets people discuss a problem (challenge) and it lets people gather at events. People are able to create challenges and other people can then help out with these challenges. A challenge is a problem which people can discuss to find a solution for the problem. The website aim at two groups: Organization and citizens. It seem to be a very complete and well organized project with a big impact. The solution works on computers and smartphones but the solution works best on a computer. The project is not yet fully developed I have only seen a beta version. The project features many good ideas which haven't been implemented so time will tell what to think of the project. The project differs from the proposed project in the following ways: It is not focused on managing or sharing small concrete tasks, it is intended more for computers than smartphones.

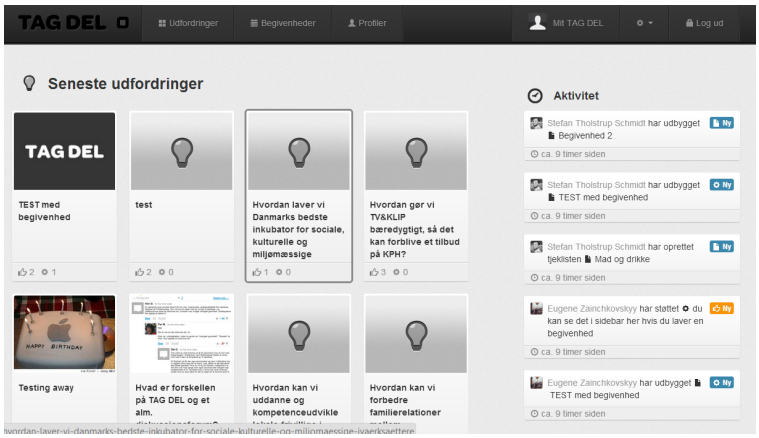

Figure 3.10: TagDel screenshot

Strengths:

- It aims widely a citizens, organization and companies.
- It is not associated with a specific cause, organization.
- Has a built in privacy function. Which allows user to create private challenges.

- Is integrated with Facebook, LinkedIn etc.
- Profile site for citizen including a volunteer CV.
- Invite people to help with challenge.
- Challenge/solution concept where users can propose or solve subjects in connection with other users.
- Project tools which allow for planning of projects and part activities.
- The site lets the user present videos and images.
- Auto shares challenges to relevant user. By knowing user interest areas.
- Calender function to help mange the challenges.
- Recourse database that allows one to search for relevant user skills.
- Is already connected with a lot of people, organization. Doing a great promotional work.

Weaknesses:

- The site seem to aim at emulating a lot of social network functions which Facebook has. This might be unnecessary.
- The ideas seems somewhat comprehensive/complicated. Will the user interface be able to support this?
- They seem to focus more on organization than on individual people.
- hasn't launched yet.
- The project is focused on crowd surfing problems to come up with ideas and to create a social network. Which is a different focus than the proposed app.
- The beta implementation has many errors and hasn't implemented all the promised features.
- The design it quite confusing to use on a mobile phone.

3.3 Task Management Software

Traditional task management software is a great source of inspiration for creating the software for this project. The mobile web app which will be created in this project shares many common trades with this kind of software. Useful features in the traditional task management system should be localized and implementing into the proposed app. Task manager functions can be a valuable way to keep people using the app because great functions for managing a project or task will help organizations.

An exciting project called "GeoOP" was chosen for review for two reasons. It has gotten great reviews and it has a mobile app and a web app. The "GeoOp" project is focused on being agile and flexible. In the following section the app is reviewed.

GeoOP
It is a task management software aimed at companies. It allows the company to manage tasks and workers. The app can support the company in using the employees efficiently and in solving the tasks in time. The system consist of a web page, a web app and a native Android and iPhone app. This system is very complete it's a professional product that cost money. It has occasionally been used for volunteering work. [19]. All their products works well except from their web app which has a terrible user interface.

Strengths:

- The design is clear and beautiful.
- The system incorporates many features.
- Interface similar to the Facebook app. Easy to use and efficient use of screen area.
- Lets the user share his position so the worker can be utilized by the company.
- Setting menu where the user can set preferences: when to track user, distance for nearby jobs, how to sort jobs, photo quality (due to bandwidth).
- Auto address search field while user is typing.
- Address is showed on a map and lets user edit address with a map marker.

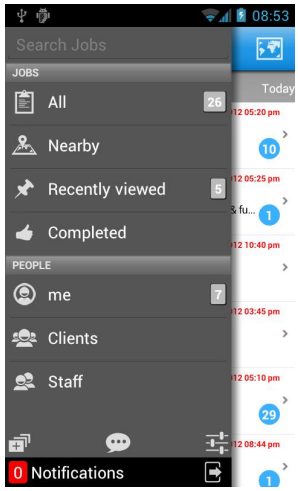

Figure 3.11: Native Android app screenshot

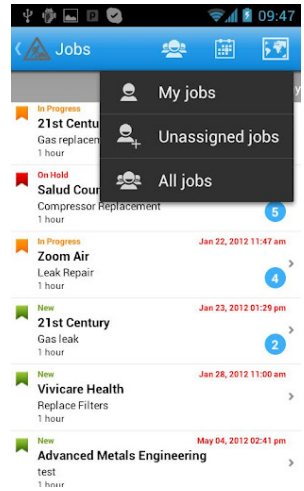

Figure 3.12: Native Android app screenshot

- Templates for jobs/tasks.
- Features for adding people to jobs when administrator.
- Feature for adding different kind files to job.
- Signing a task off as completed.

Weaknesses:

- Not focused on volunteer work.
- Costs money.
- Poor web app.
- To complicated to many features. Aimed at big project not micro volunteering.
- Many features are not relevant for volunteering work.

3.4 Desirable Features

This section lists what was learned from reviewing similar projects. A condensed list of desirable features and attributes are presented in this section.

- The different projects reviewed lets people volunteer in different ways. "Spot of time" lets people help with specific tasks they sign up for. "Help from home" lets people help from their own home. This translates into several general principles: a volunteer should be able to offer help or a service on a specific location and time chosen by the volunteer. The volunteer should be able to sign up to offer help or a service on a specific location and time chosen by the beneficiary. Having several ways of offering help gives a more flexible system which makes it more likely that a person will offer help.
- Keep user updated with recent info by sending emails. This is a useful way of reaching the user through a web app. Since the web app can't push messages out to the user device directly, emails are a good substitute. It will work on all devices since the user is able to check his email from a pc as well as a smartphone. On the smartphone the user will be likely to receive the mail within minutes after it has been sent and the user will receive a notification. The app has a direct link to the user. It is in general a much better Idea to center communication on email instead of creating a separate messaging system for the app. see how "denlilletjeneste.dk" works.
- The users profile should contain a list of topics which are of interest to the users. It should contain information about skills that the user processes. This will help the application in presenting relevant info to the user and in representing relevant users to organizations. See "sparked.com".
- The system should contain templates for tasks and help offers. Allowing the user to choose a template before creating a task or a help offer. This will inspire the users in offering help or creating tasks. These templates should educate the user on how to continue in creating a task etc. This will hopefully accomplish two things. Inspire people to create more content and it will allow people to create content of higher quality in the app. See "spotsoftime.org.uk".
- The app should be able to serve organization in their needs. This is important since organization has the largest recourse of potential volunteer's as well potential beneficiaries. It can be seen that many of the apps has a collaboration with several organizations. These organization represent sectors which helps the needy. A list of all the available sectors should be

compiled. This list can then be used to create a list of Danish organization which is of interest. The app should then try to serve the need of these organizations. This can be done though appropriate templates.

- The app should contain task management functions. This will help the app in serving organizations. The app should not be a complete task management system since apps like that already exist. It should nearly have the core features which will help the organization in organizing their tasks and volunteers. The app "geoOP" is a good example and inspiration can be gathered from this app. Organizations is in need of features that allows them to assign a volunteer to a task or to know when the task is completed. The organizations would probably also like to create projects which help them by covering relevant tasks, beneficiaries and volunteers in a single project.

- The projects uses very different incentives to get people to help. "Denlilletjeneste.dk" is centered on payment. "sparked.com" is centered on letting people evolve their skills and make a difference. "Tagdel.dk" and "frivilligjob.dk" offers the users to receive a diploma showing what good they have done. "Do some good" allows the user to get points and get real prizes for helping. All of these incentives are useful and a good app should make use of all of them to the extent possible.

- The reviewed apps and websites has many different designs. In general the apps has very few features. Which makes them kind of useless. The websites on the others hands is offering the user a good overview and many features. This is of course a classical design problem. It is much easier to offer many features and a clear design when designing for a computer. Therefore it should be considered to create another app in addition to the mobile web app. The additional app should be a computer version of the proposed app offering the users a good overview of the app and some more advanced features. This could be especially important to be able to offer the organizations the needed functionality to organize their projects, tasks and volunteers. This is out of the scope of this project.

- The reviewed app serves different segments of people in different ways. These people and the actions offered have been divided into some lists to show the possible ways of volunteering.

  - Volunteers: Religious people, professional people with specific skills, people with normal skills (like talking, singing, playing) and people that are bored and have time to spare.
  - Beneficiaries: people in care homes, hungry people, homeless people, lacking the skills, ill people, lonely people, handicapped.

  - Activities: help with pets, help with craft, clean for people, move stuff, gardening, administration (bills etc.), cooking, bike maintenance, IT help, mechanical help for car and motorcycle, assembling furniture's, play music for people, snow cleaning, help with homework, painting.
  - Help offers: a place to sleep, a place to stay, offer people pampering and beauty services, food, conversation, play games, Celebrate (birthday Christmas), social and fun activities like (a chat, play with a pet, knit or stitch, being creative like painting, perform music live, discuss literature).
  - Area of work: children, humanitarian, religious, cultural, nature, political, social, sports, healthcare.

  .

- Privacy, most apps requires the user to log into the app to use it. Other apps like "denlilletjenneste.dk" allows for a unauthorized user to see the tasks but not the user profile. This makes a lot of sense. It allows for "not users" to be able to see what the app has to offer. What help can they get? What help can they offer? The idea is that everyone can view some content but in order to interact with the system or to look at user profiles you must be logged into the application. The user should also be offered a possibility to set a privacy setting of the content they created. This allows a user to protect sensitive content. This privacy setting is part of the "tagdel.dk" system.

3.5 Why Another Project?

None of the projects reviewed does the same thing as the proposed app. When reviewing the Danish projects. Two similar projects where found. "den lille tjeneste" is similar but it is not focused on volunteers and it is not focused on being mobile and agile. "tagdel.dk" is also similar but it is not focused on solving and sharing specific tasks but focused on discussing problems and creating a community.

The following list explains the unique strengths of the proposed application.

- The existing apps offer different services like virtual micro volunteering or traditional volunteering. The proposed app offers a new kind of service and has a different focus. It offer and mix between micro and traditional volunteering.

- Most existing apps are technically different. Since they offer a service that's only available on a pc or a specific mobile. This is in turn not only a technical issue because it affects the way that the user interacts with the service. The proposed app offers to be available on all platforms allowing the user a chance to always offer or receive help.
- The proposed app connects with two kind of users: helpers and beneficiaries. Which can also be the same user. This creates a very different app where beneficiaries and helpers are equal. Where the user base has doubled. It is an app for everyone. It not an app exclusively for committed volunteers.
- It is important to get the service in Denmark. It will create more awareness about volunteering and it will introduce Denmark to mobile volunteering. Which hasn't been done so far.
- The proposed app will be available to everyone it will not be proprietary. It will be open to all people and organization regarding their political or religious view. It will be free to use no fee will be charged.
- The proposed app will be agile and flexible. It will supports people who wish to receive or offer help. It will allow people to do it on their own terms. It will also support organizations who wish to offer help or receive help. It will allow for the help to flow freely between people and organization.
- In the end it is also about creating the best service. Therefore it is acceptable to create a new service that is somewhat similar to existing services. If the service is better and more complete.
- The app will shorten the path from the point where help if offered to the point where help is received.
- It will minimize the resources needed for helping other people. Resources like time, money, people, transportation, offices etc.

Chapter 4

App Design

This chapter explains the design of the application in details and the reasoning behind.

4.1 General Features of the App

This sections discusses the general design choices that have been made.

Application Overview
The general design principle behind the app is to create a mobile web app that offers it user a location based service. The services consist of a system that lets people offer and receive help. The service is aimed at individual people as well as organizations. The app can among other things be used to: Create a problem (task) and let other users help with it, offer a service (help point) which other users can sign op for to receive help.

To accomplish these tasks the system consists of a client side which is a mobile web app built to work on most devices like smartphones, tablet and pcs. The app is built with basic technologies like HTML, JavaScript and CSS. The app is mainly built using jQuery mobile which is a framework for HTML5 what

eases that task of building a Responsive app that works on all devices. The app incorporates features like, Google maps and geolocation to make the service location based. The app is connected with Facebook to let the user share content and let the user login easily.

Figure 4.1: App components overview

The server side of the app is located on as shared web hosting server. The server side takes care of storing the user's data and loading the user data. This is done with a MySQL database for storing the data and PHP functions to load and save the data. The server side takes care of protecting the data. The data is divided into three groups: Public data, Data available to all users logged into the app, Private data only available for the individual user. The purpose of the server side is basically to manage the user data. Make sure that the data is stored and shared in an appropriate way. The server side also takes care of authenticating the users.

Authentication

The app is protected with a login so only authenticated user can use sensitive features of the app. The purpose of the app is to connect people with other people they don't know and let them offer or receive help. This system is based on trust so it is important that all user in the system are real people with correct profile information. First step for assuring this is to protect the system with a login and for people to create profiles.

An easy second step is to let people login using Facebook which requires them to have a Facebook profile. This makes it more likely that their profile is connected to a real person. The app should therefore feature a Facebook login.

In addition to a login the application must feature a warning system which lets the user know if suspicious actions are taking place.

- The user can comment on others users, tasks etc. This can raise awareness of problems within the community.
- The user can click a report button to report a inappropriate user, task etc.
- The user can give feedback or contact the application developers.
- The user can read news in the application. All user will see general warnings.

The application should also feature an alternative login. This login will be created based on an email address. This will allow anyone to create a false profile. This kind of profile needs an authentication step to identify the real person behind the user. This could be done by

- Letting the user verify his identity by using his credit card.
- Letting the user enter a code which is sent to him by real mail.
- NemID validation.

This step requires a lot more work than creating a Facebook login. Which means it would not be a feature for the first version of the application.

Privacy
Another reason for having a login except security is privacy. Most users are concerned about privacy. Meaning that the system must include features to protect the user privacy.

The basic idea of the system is to have a very open system where most content can be viewed by everyone even people without a profile. To interact with content or to view profiles the user needs to create a profile and log into the application. Some users will want more privacy therefore it must be possible for a user to mark content as private. The content will then not be shared with anyone if the user wishes other users can be invited to interact with the private content.

The app data is divided into several categories of privacy. Most data is completely public and very little data is private.

The choice to create a custom database instead of using Facebook for storing the data serves a purpose. The app should have complete control of the data:

control of who accesses the data and control of how to share the data among users. It is also important that the data can be shared across many systems which is easier if the data are in a database system that is controlled fully.

Independent System
The app should be able to function on its own to a large extend. This will help to keep the cost of running the app down. The users of the app must get the service they expect but in a low cost way. The need for professional people managing the app and the users should be minimized. The following functions are proposed to help with this.

- The app has a function that lets users mark content as inappropriate. This will make it easier to administrate the content of the app.
- The users can use a comment function for leaving comment on tasks, users etc. This will help to auto regulate the user behavior in the community. People will find a common understanding of what is acceptable and what is not.
- The app has a points system where active users are enforced in their behavior. This is an automatic system that motivates user by showing them what they have accomplished and their personal development over time.
- The points system can also serve as a method of appointing some users to "super user" which can moderate the rest of the users.
- The app must also feature auto generated content. This can be created by using user statistics to offer content like top 10 users etc.
- The system will also offer communication between the "application developers" and the user. The "application developers" can send messages to users through the news feed in the app and the user can send messages to the "application developers" by using a feedback function.

Integration With Facebook
The application is integrated with Facebook to create an environment for sharing content. This is a good way to attract new users and to motivate existing users to use the application. On the downside its bad for privacy people are nervous about their content being shared on Facebook.

To protect user data the app saves all data in a separate and private database which is not connected to Facebook. The content that is shared on Facebook is only shared when the users allows it to happen. This allows the users to feel safe that the app is treating the data in an appropriate way.

The application will offer a tight integration to Facebook for the users who wishes to use Facebook but the rest of the users can choose to use the app without Facebook.

The users will be able to share content to Facebook, like tasks or help points that they created or invite friends from Facebook to the app to help. Users can transfer their achievements in the app to Facebook. So their friends on Facebook will be able to see all the good they are doing in the app.

Other App Design choices
The app language is Danish. This a conscious choice it will make users fell more secure that the app is a real product and not some scam. It will exclude some users but this is a price worth paying. It is to be expected that users will be insecure about this concept since they haven't tried anything like it. Therefore every possible step to make users feel more secure should be taken.

To allow all people to use the app. The app should be easy to use and have a help function. This help function should features text, images and videos to explain to people how the app works. This is important since some of the people requesting help might have little experience with computers and internet.

The app should not focus on either getting or receiving help since this could be perceived as negative so the app serves both functions. This also makes sense since all people have both needs.

The app can only be used by real people who have told their real name, address and email. This is to ensure that the app won't be abused by people with bad intentions.

The app can also be used by real organizations. It's important to serve both individual people and organizations since the represent two separate groups. The organization represent a lot of the existing volunteers and beneficiaries and the individual people represent an unused recourse that has no contact with the "traditional system".

Distribution
The downside of a web app is the distribution possibilities. Normal apps has the advantage of being part of an application store on iOS or Android etc. It is hard work to promote a web app. No one will learn about the app until you advertise for it.

This can be done in many ways. In regard to the app design the app is integrated with Facebook so people will learn about the app though Facebook. The app will try to motivate existing users to share content on their timeline. The app

will auto share user generated content or actions to Facebook news feed if the user has allowed it. The hope is that this will help to spread the message about the app.

4.2 Graphical Layout

When designing the layout for the app it is important to give the user a recognizable user experience. This web application will be used across many mobile operation systems. The two important ones are iOS and Android since they are most common. The app should work as the user would expect it to work, so the user will find it easy to use.

When comparing android and iOS there are some similarities and differences between the design guidelines. The similarities should be utilized to make an app that is recognizable on both Android and iOS. See reference for more info about the difference and similarities on iPhone and Android. [20]

Navigation Design
The tab layout with a action bar is common on both Android and iOS. The tab layout can be seen in figure 4.2 and 4.3. The difference being that iOS recommends the menu to be at the bottom of the screen where android recommends it to be at the top. iOS apps are very consistent with having the menu at the bottom. Android apps have it both at the top and the bottom. Therefore I propose using a tab layout with the menu bar at the bottom of the screen. The design recommendations from Apple and Android can be found here [21] , [22]

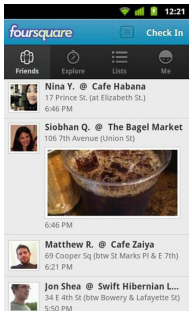

Figure 4.2: Android example

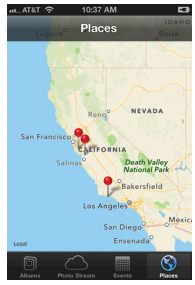

Figure 4.3: iOS example

Other OS does not use a tab menu design as the most common design. Windows phone uses their own metro style design which has little in common with Android

or iOS. Example in figure 4.4. Therefore the web app cannot not satisfy all OS but most satisfy the design patterns of the most common ones.

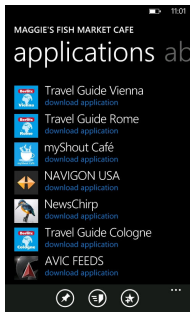

Figure 4.4: Windows phone example

The tab layout is a simple and gives the web app hierarchy a very flat structure. Where the user always knows how to find his way around the app. It is important that the menu tabs contain features that are essential and that the features are equal.

Back Button

An important difference between Android and iOS is the "back button". iOS has a back button located at the top left of all apps. Android has a hardware back button located on the smartphone. Normal web pages uses the browser back button. Other platforms have other solutions. This is a major difference between platforms. Therefore the use of the back button should be minimized. This can be done through the flat structure of the tab menu design. Since the structure is very flat the user will never need to traverse more than one level in the hierarchy to get to a page which is located in the menu tab. This makes the use of the back button less important. The back button should be placed a convenient place in the app but not follow the design of a specific Operation system.

Screen Size

The initial idea was to support even very old phones. After some experiments it became apparent that it was not possible to design the system for all resolution with a good result. Therefore it was decided not to support phones with very small screens and very low resolution. It also became apparent that a lot of user would use the application from their computers. Therefore it was decided that the app should work on a phone and a computer. Though optimized for phones with a resolution of approx. 400x800 pixel and up. On Android phones this resolution covers the mid-range phones approx. 1.5 year back and the top range phones 3 years back. When talking iOS it covers iPhone 4 and up. Where

iPhone 4 is approx. 2.5 year old. Smartphones with a lower resolution will still work but not with an optimal user experience. All pcs and tablets will have a sufficient screen resolution.

A proposed design sketch is shown in figure 4.5.

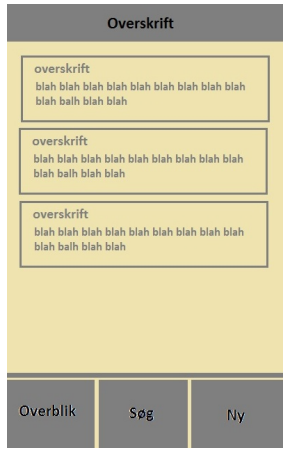

Figure 4.5: Application Design Sketch

4.3 Actors

This section will explain the possible roles which a user/actor can have in the application

The application has two kind of user. Therefore a user can create two kind of profiles.

- **Individual user:** This is the basic user who uses the system for offering or accepting help. The user is connected to a real person and therefore this person is responsible for the profile actions.
- **organization:** This user is aimed at organizations. This user can't offer or accept help. This user has exclusive features for managing tasks, help

points and users. Organizing the content into projects and organizations. This user can be used by an organization and offers the tools needed for an organization.

The individual user can act as either a helper or a beneficiary. Meaning that the people who uses the application for helping has the same options as the people using te application for receiving help. There is no distinction between the two.

- Helper
- Beneficiary

This is due to the fact that all people has the need to both give and receive help even though most user might be mostly either helpers or beneficiary. It is important to show the users that everyone are allowed to receive and give help. This also means that the application are able to serve a far larger number of users. One application for "two" kind of users. In the following use case diagram some functions are marked as common for both kind of users where other features are marked as either helper or beneficiary. This is done to put emphasize the purpose of the feature.

4.4 Use Cases

This section offers the reader and in depth explanation of some main functions the application will support. Some major functions has been explained explicitly with a full use case.

Use case	Log into application + Create user profile
ID	1
Actor	Individual user.
Preconditions	User has no account and want to start using the app.
Flow of events	1a. User Presses "Facebook login" and is transferred to Facebook. (a) The user must accept the Facebook permits used by the application. (b) The application will collection info from users profile page like: name, picture address, education, email... (c) User is transferred back to application to complete the registration. (d) User enter/verify his: name, address, education, description, email, telephone number. 1b. The user Presses "normal login" and is transferred to a profile creation page (a) The user must enter user name, password, name,picture, address, education, description,email telephone number. 2. User Presses "gem profil" and is transferred to the start page of the application.
Post conditions	The user profile have been added to the database. User is at the start page of the application.

Use case	Create a task
ID	2
Actor	Beneficiary.
Preconditions	User is logged in and user needs help with a problem.
Flow of events	1. Presses the "ny opgave" from the menu bar in bottom of app. 2. Chooses the category for the task. 3. Enters address for task. 4. Enters date and time for task. 5. Enters a description of what the task is about. 6. Presses "Gem opgave". The user is transferred to a page showing the new task.
Post conditions	Task saved in database and user is located at a page showing the new task.

Use case	Search for item
ID	3
Actor	Helper.
Preconditions	User is logged in and want to search for a task, help points or project.
Flow of events	1. Clicks the "søg" from the menu bar in bottom of app. 2. User is transferred to a search page with criteria for the search. The criteria will be set to find everything or to the user previous search criteria. 3. Chooses the type of item task, help points or project. 4. Chooses the category of the item like: conversation, craft,transportation etc. 5. Chooses the allowed geographical distance to the items. 6. Chooses the allowed time until the execution time of the item. 7. Presses the "søg" button. The page will now show a wait sign while the query is performed. 8. The user can now choose to see the results in three formats: list, map or calender. 9. user can click any result he finds interesting and want to learn more about.
Post conditions	User has performed a search. The results are showed to the user. The search preferences are saved in user profile.

4.5 Use Case Diagrams

Figure 4.6, 4.7, 4.8, 4.9, 4.10, 4.11, 4.12 shows the use case diagrams with all the actions which should be available to the users in the final application. The use cases are divided into section represented by squares. This is done to show which use cases are logically related. The bubbles represent the individual use cases. The green use cases will be implemented in the prototype the blue use cases will be implemented in a later version.

User and Organization Profile

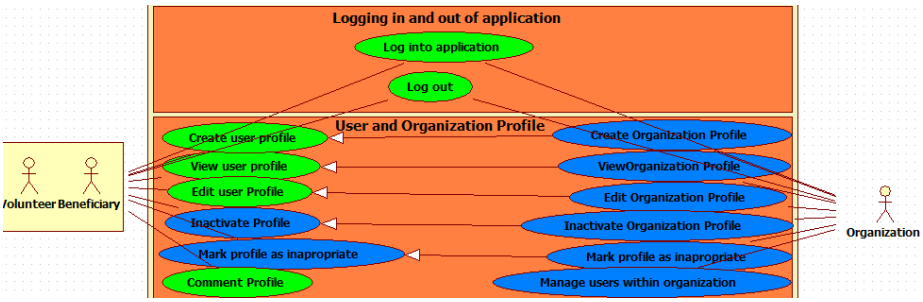

Figure 4.6: Login and profile

- **Create user profile:** The process must be quick, ask for minimal info, show the user which info is private, acquire relevant info like user skills, interests, identity. Parts of the process must happen when user logs into system first time. Other parts of the process can be done later when user is motivated to complete the steps.
- **Create organization profile:** The process is similar to the user profile creation. The info is slightly different.
- **Show and edit user profile:** The user should be allowed to view his own and other users profiles. When viewing a profile the user can read relevant info about the user like: description, skills, stats and created tasks. It is also possible to write a comment to praise or warn about the user. Sensitive info like address and email are not showed! When viewing own profile the user will be allowed to edit the profile info.
- **Show and edit organization profile:** The organization profile can be viewed by all users. The organization are able to edit their profile info. This is done from their organization profile page. The organization profile page can serve as a info page where people can learn about the organization

and which tasks, users, help points and projects are connected to the organization.

- **Inactivate profile:** The user/organization are not allowed to delete a profile. Instead the profile can be inactivated. This is done to: Keep the database intact, make it easy for a user/organization to reactivate profile later, keep identity info on user. Even if the user edits the profile and deletes all useful info. The system will still contain a copy of his initial profile creation information. So in the case of criminal offenses the user can be located.
- **Mark profile as inappropriate:** It must be possible to report a user/organization profile to the system administrators by pressing a button marking the profile as inappropriate. This is an easy way for a user to act on his suspicion.
- **Comment profile:** A user can leave a comment on other users profile. This allows for offering suggestions to the user. It also allows for a public review of a specific user. Telling what is good and bad about the user.
- **Manage users within an organization:** An organization can invite users to be part of the organization. When the user has accepted the invite. The user will be shown on the organization profile. The organization can also remove users from the organization.

Tasks and Projects

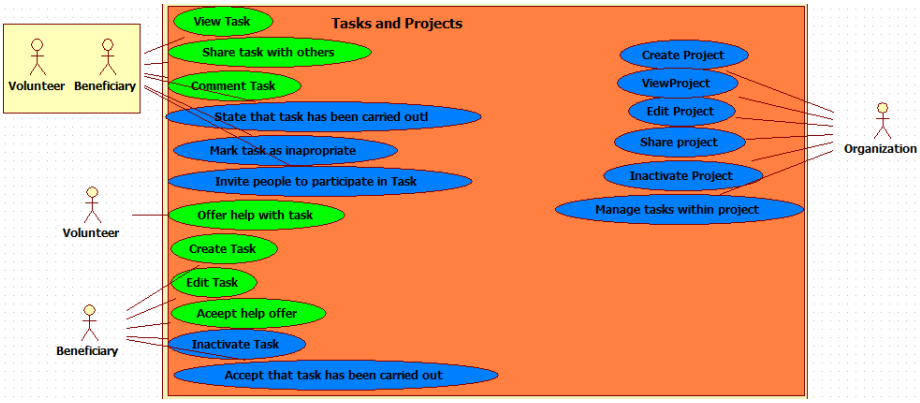

Figure 4.7: Tasks and project

Tasks

Users of the app can create a task in order to receive help from other user to solve the task. Money can't be involved in getting the task solved, the task

solving time can vary from a few minutes to a couple of hours. The task should if possible be described with a time and a place where the task is to be executed.

- **Create task:** A beneficiary can create a task. The beneficiary must enter info like: type, title, description, location, time, date, duration. User can also add assets like images and video. The point being that a helper can understand what the task is about and know when and where it is located. The creator can also set a privacy level. The task can also be set to occur at frequent intervals.
- **View and edit task:** A beneficiary can edit and view his own task.
- **Share task, invite people to participate in task:** All users can share a task to their Facebook profile or invite their friends to help.
- **Offer and accept help with task:** It is possible for a helper to offer his help with a beneficiaries task. The beneficiary can accept the help offer.
- **Comment task:** All users can comment on their own or other users tasks.
- **Inactivate task:** The owner of a task can inactivate a task when it is no longer needed.
- **State/accept that task has been carried out:** The helper or the beneficiary are able to state that a task has been completed.
- **Mark task as inappropriate:** All user are able to mark all tasks as inappropriate.

Projects
Organization are able to create projects. These projects are containers for the tasks that are logically related. This might be all tasks related to a specific, city, area or department etc.

- **Create Project:** Create a new project with similar content to a task. Explaining the purpose of the project.
- **View project:** The project can be viewed by users with access.
- **Edit:** The project can be edited by the owner.
- **Share project:** The project can be shared on Facebook.

- **Inactivate project:** The project can be inactivated when no longer needed.
- **Manage tasks within project:** Add and remove tasks associated to the project. Get overview of tasks associated with project.

Templates for Tasks and Help points

The system must contain templates. Allowing the user to easily create standard tasks or help points. The system should contain some standard templates but the user should also be allowed to manage his own custom templates that suits his specific needs.

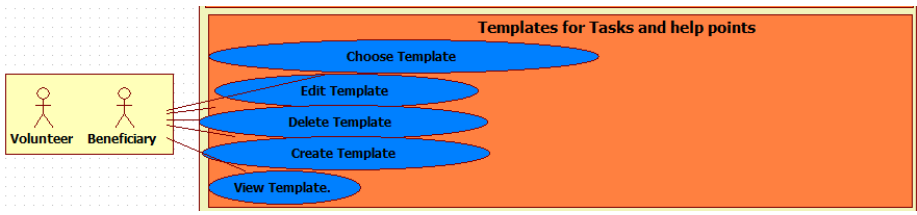

Figure 4.8: Template actions

The user must be able to Create, Edit, view and delete his custom templates.

The user must be able to choose a template prior to creating a new task and help point.

Search for task, help points and projects

Figure 4.9: Search page actions

The user can search for items. Items include tasks, help points or projects. The user can manually select search criteria before conducting the search. To minimize the user effort the application will remember the user criteria and auto set the criteria for next search. The application can also automatically gather the user's location and user skills and use them when conducting the search.

Search Criteria:

- The distance from user location to items location.
- The time interval when the item is available. Either the time when a help point is available or time when a task must be conducted.
- Category - Type - Item. The user is able to narrow the search down by choosing what kind of item he is looking for. By choosing a category and type for the item. This could be Category: children, Type: homework aid.
- The Skills needed for the task.
- The Duration of the task.

Select View:
When the query is finished the user will be represented to the items found. The user can then choose to view the items in one of the following views.

- On a map showing the location.
- As a sorted list.
- In a calendar view sorted by date.

From the view the user is able to click an item. The user is then transferred to the clicked item. The user can view all details about the item and interact with it. Depending on type of item the user has different possibilities. The user might offer help with a task or request help from a help points etc.

User Overview Page

The user can go to an overview page that offers the user a quick overview of things going on in the application associated with the user.

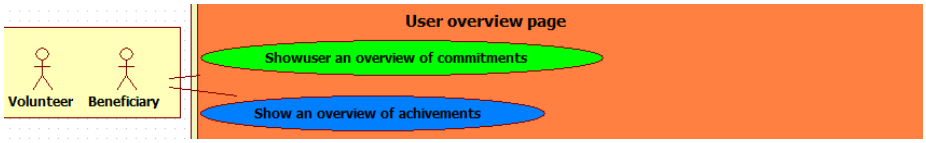

Figure 4.10: Overview page actions

Commitments

This page shows the tasks and help points associated with the user.

- Tasks that the user has offer help with.
- Tasks that the user has requested help for.
- Help points that the user has created.
- Help points that the user has requested help from.

User Stats

Overview will also show statistics about the user's behavior. This will show the user how much he is helping and how much help he is receiving. It will give the user a sense of continuity and motivate him to keep using the app. Overview will shows how many points a user has earned. A User can gather points by

- Helping other people with tasks.
- Receiving help.
- Commenting on profiles, task and other.
- Sharing content to Facebook.
- Inviting people to join the app or help out with tasks.
- Using the app by logging in, reading news, search and viewing content.
- Creating content like tasks and help points.
- Creating a complete profile and completing questionnaires.
- Giving feedback to application developers.

Help Points

Help points can be created by users/helpers who wishes to offer a service. A user might offer food each Sunday evening from 20-22 at his home address.

Figure 4.11: Help point actions

Beneficiaries can request the help and then make an agreement with the creator of the help points that they will show up at his address Sunday evening for a meal of food.

Help points are in some sense the opposite of a task. Since the user is offering help instead of requiring it. But the attributes and the functions the user can perform with a help points is quite similar to a task. The naming is just different.

With help points: Beneficiaries can request help With tasks: helpers can offer their help

With help points: Helpers can accept request for help. with tasks: Beneficiaries can accept offers for help.

All the individual user actions relating to a help points will not be explained but the actions can be seen from the use case diagram. The actions is similar to the actions of a task. The user should be able to manage, share, comment, interact with help points.

Other Functionality

This section describes all the rest of user actions that didn't fit into the previous categories.

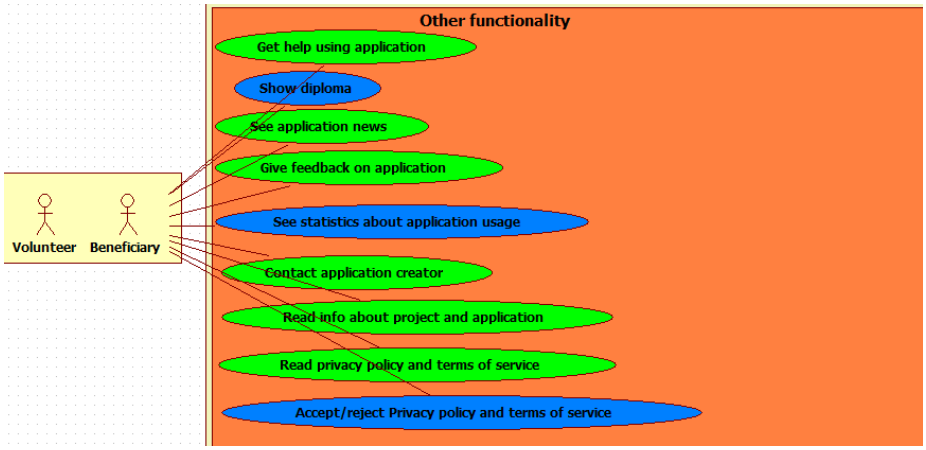

Figure 4.12: Other actions

- **Get help using the application:** The user should be able to click a button and receive additional help in using the app. The help can consist of text, images and video.
- **View diploma:** The user clicks a button and the application presents a diploma for the user. This diploma shows what the user has accomplish in the application. Tasks solved. Skills used etc.
- **View application news:** The user click a news page and receives a list of news about the application. These news can consist of things like: app problems, user warnings, users achievements, press coverage, user statistics, new features etc.
- **Give feedback on application:** User can write a message and post it to the application developers. Allowing the user to influence the app. tell what is good and bad.
- **View statistics about application usage:** Presents a overview of how the app is being used with statistic like: number of user, number of tasks, tasks solved, most active users, etc. This feature makes the app more a live and interactive.
- **Contact application creator:** The user is presented with a page with the different possibilities for contacting the application developers. This is relevant for some users. It might be especially interesting for organizations.

- **Read info about project and application:** User enters page with info about the project and the application. The user can see the advances in the project. This page adds content to the app which will entertain users.
- **Read privacy policy and terms of service:** This is a mandatory function. The user is able to read how the application deals with his private data and how the app should be used.
- **Accept privacy policy and terms of service:** The user can either accept or reject the application terms. Only if the user accepts is he able to use the application.

Chapter 5

Technologies for App

5.1 Native App vs. Mobile Web App

An important choice made in the project was to create a mobile web app instead of creating a native app. The choice was taken for the following reasons.

- Support for most smartphones as well as support for most computers.
- Only one code base to develop and maintain. Instead of making a individual app for Android, iPhone and computers.

Advantages of a Mobile Web App
Lets discuss the general advantages of creating mobile web apps. A mobile web app shares most features of a HTML5 website. HTML5 is used as a buzz word for a compilation of technologies like HTML5, Javascript and CSS3. The purpose of HTML5 is to support all the necessary technologies for creating an applications which runs in the browser on all platforms. HTML5 websites are able to accomplish the same as a native app or a computer program. HTML5 is not a standard and is not yet fully supported. HTML5 is the goal of the future. It dictates how websites and the browser should function in the future. The point being that if HTML5 is the leading technology of the future then mobile web apps are also the future.

- HTML5 technologies have support for creating a responsive design that adopts to the device being used: PC, smartphones, tablets.
- HTML5 is supported by big companies like Apple, Microsoft, Google, IBM, Adobe and many more. Most companies believe that HTML5 is the future.
- HTML5 browser support is growing all the time.
- HTML5 supports many advanced features like storing data locally on device, fetching device location, fetching files from device etc.
- The way people use their computers and mobiles are changing. It is no longer necessary to run software locally on the device. Instead the software can run in the CLOUD and send HTML5 pages to the device browser.

HTML 5 Featurs

The purpose is not to create an app which is fully HTML5 compliant but merely to create an application that borrows the necessary features from HTML5. The application which is proposed will in time need the following features from HTML5. Since some features are not widely supported is is not necessarily smart to implement them at present time. Figure 5.1 shows browser support for the following HTML5 features.

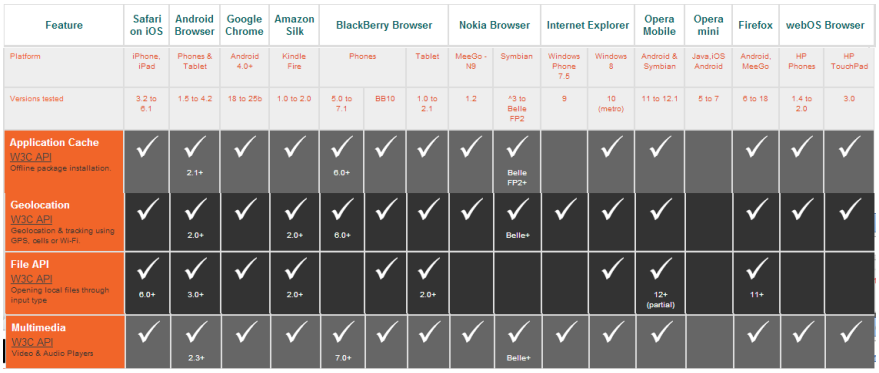

Figure 5.1: HTML5 features (screenshot from mobilehtml5.org)

- Access to local file system to be able to acquire images, video, sound. To lets the user share content (supported by newest generation of browsers and devices).
- Geolocation. Access to location of device to be able to offer location based services (widely supported).

- Play back video on devices (widely supported).

All these features are supported by HTML5. In time the application will be able to support all the features a normal native application or pc software supports. Go to website [23] to see the specific support for the different browsers and features.

5.2 Framework for Mobile Web App

When creating a mobile web app it is necessary to find an efficient way of doing it. It is necessary to have a responsive web design that works on most platforms. It is necessary to find an existing framework which eases the job of creating the design. A search for relevant framework were conducted. Many reviews were read to find a good match.

This website [24] has a comprehensive mobile framework comparison chart. In order to find a useful framework the following requirement were specified.

- Had to be free.
- Support iOS, Android, Windows Phone and more if possible.
- Designed for creating mobile web apps.
- Was a mature project.
- Easy to use (for me).

Figure 5.2 shows the results of the search.

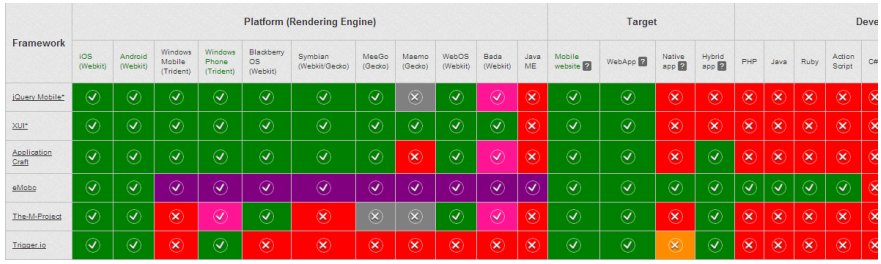

Figure 5.2: Mobile framework comparison (Screenshot from markus-falk.com/mobile-frameworks-comparison-chart)

The requirements left the following choices: jQuery Mobile, Application Craft, Emobo, The-M-Project, XUI. The-M-Project and Emobo didn't support as many platforms as the rest of the frameworks did so they were removed too. Which left Jquery mobile, Application Craft and XUI on the list. Application craft was also removed because it was not completely free. XUI was removed because it didn't seem as a mature project.

In the end jQury mobile was selected over the other frameworks for the following reasons.

- The framework is utilized by inserting HTML tags into a regular HTML page. This simple method leaves the control with the developer and gives a lot of flexibility.
- The framework has gotten great reviews and is popular. It is developed by the same people who developed the very well known jQuery library and jQuery UI library.
- The framework is popular and mature which makes it easy to acquire resources and help for development.

5.3 Server Side Technologies

It was chosen to use a combination of PHP as scripting language and a MySQL database. The main reason was that this option is supported by most website hosting companies. Which in turn means that is it a reliable technology. The use of PHP and MySQL is very common. It is easy to acquire help in the development process. Later on it will be easy to acquire programmers who are familiar with the technologies.

MySQL
It is used by small as well as big websites like Facebook, LinkedIn and Wikipedia. MySQL should work well now and scale well later when the app becomes popular. The list of MySQL customers can be found at [25] MySQL is basically free to use as long as it is used in a non profit scheme.

PHP
PHP was used for the following reasons. It is the most widely used scripting language [26]. It is free. It supports many databases. It has many popular frameworks to support development. It is used in small as well as big websites like Wikipedia.org and Facebook.com [26].

Shared Web hosting Service

Initially the web app was hosted by a free web hosting service. This proved to be a very bad idea for several reasons. The FTP connection has slow and unstable, the free domain was blocked by Facebook. Instead a payed solution was chosen. A solution from "meebox.net" was chosen for two reasons. It was Danish which makes contact easier and it had a high level of service. The hosting offered by Meebox has worked flawlessly. The hosting is fast and stable. So far it has proved to be the right choice. The service offered by MMeebox supports PHP and MySQL technologies. It was never consider to host the app on any services closely connected to Google or Facebook etc. Since the hosting service should come without any restriction and since the data saved should not be made available to another company. Neither was a dedicated server considered due too the fact that it is more expensive. From the beginning of the project it has been a priority to choose free or cheap solutions which still delivered the required functions.

5.4 APIs Used

This section lists the used APIs, specifies relevant details about the APIs and mentions alternative APIs.

Google Maps
The application uses Google Maps Javascript API v.3. Which is the official version. Version 3 is designed for supporting mobile devices. The Google maps API is a free service as long as the application using it is also free.

The application are allowed to make 25.000 request to Google maps each day for free. If each user makes 10 request a day it means that the application is able to support 2500 daily active users for free. This is more than enough to get started. Facts were found at the Google Developers website [27].

The choice of Google map API is also due to the fact that it is a popular service. This hopefully means it works the best, has most support etc.

Alternative APIs include: Microsoft BING, Nokia Maps, Mapquest, Leafle.

YouTube
YouTube's service is used to offer video content to the users of the app. Currently the YouTube service is only used to offer content from the creators of the application. If the application in the future should feature videos with user content those video should be places on the applications own servers. To protect the users privacy.

YouTube's service has the following advantages and disadvantages. Derived from [28]

Advantages:

- The videos are hosted on YouTube's servers. So bandwidth is free.
- The service is free.
- Statistics over video playback.
- Videos are indexed into Google.com
- Multiple encoding of video
- Embedding into web page with iframe and HTML5
- Social nature, Google/YouTube will let other user find your video through all of their services.

Disadvantages:

- YouTube has unlimited usage rights for videos.
- YouTube has a history of removing videos for no good reason.
- Maximum length of videos approx. 15 minutes.
- No customer service. YouTube has very little support for their customers.
- YouTube domain is sometimes blocked from companies.
- The video are indexed and available to everyone.

Alternatives: Vimeo, Blip.tv , Flickr.

Geocoding
The Google geocoding API is used in the application. Google geocoding allows for 2500 request per day. The application only uses the geocoding when a task is created. This service allows for 2500 tasks being created each day. The application looks up the address of the task location and saved the corresponding coordinates in latitude and longitude along with the task in the database. When people later searches for tasks no geocoding is involved. This limit of 2500 tasks/items created each day is acceptable for now.

Advantages:

- Works well together with Google maps API.
- Is one of the fastest service when making a query for an address.
- It's a very popular service. So it is easy to find developer support.

Disadvantages:

- It is required that Google geocoding is used in combination with Google maps.
- Only 2500 request per day.

Alternatives: Yahoo Placefinder (50.000 request/day!),Openadresses, Mapquest, BING maps.

Facebook
The application has been integrated with Facebook to empower the app. Facebook is the most popular social network in Denmark (and the world). According to a study [29] done by "Danmarks Statistik" in 2010 54% of the population were using social media. 94% of those people were using Facebook. Corresponding to approx. 2 million people. Today in 2013 almost 3 million people are using Facebook suggested by a new study [30]. Facebook is by far the most popular service.

Integrating the app with Facebook is a powerful way to spread knowledge about the application by allowing people to share content from the app to Facebook. This allows for relevant people to learn about the application and the content.

Facebook is incorporated in the app in several ways.

- The app has a Facebook login. Which makes it easy and fast for people to log in.

- The app offers to share Tasks to the users Facebook timeline.
- The app creates Facebook objects and actions in the Facebook graph corresponding to the actions created in the application. Which allows Facebook to share the content automatically.

The following technical Facebook features are used.

- The Facebook PHP SDK Is used to Authenticate the user and make the Facebook login work. It also allows for the app to access the Facebook graph. The Facebook PHP SDK works in conjunction with the Facebook JavaScript SDK.
- A Facebook Application has been created. Which is required to be able to use the Facebook PHP SDK.
- JavaScript SDK is needed for client side function like creating a share button. ("del til Facebook").

Alternatives: Google+.

Chapter 6

Implementation of App

This chapter contains an overview of how the app has been implemented.

The purpose of the implementation was to create a high fidelity vertical prototype. This is a prototype which only implements some of the features but the features which are implemented should be implemented almost completely. Allowing for the test users to try the features and get an impression of how the final app will work. This also means that the app design and graphical appearance should be appealing and seems finalized.

In general it was a consideration to implement the app to such an extent that users would be able to use the app without any additional instructions. It was also a consideration to implement it in such a way that the test users were able to provide feedback directly in the app to enable the developer to learn from the test. This was accomplished in two ways: 1. By offering the users an option to give a direct feedback message, 2. By letting the app auto captures the user behavior through statistics.

Phases of Implementation The author who implemented the application hadn't previously worked with any of the technologies and for that reason the technologies was tested before they were actually used in the final prototype. The final prototype was the result of two previous project.

- An initial project tested how to create an app with the use of PHP and MySQL. A database and some basic functions for storing and retrieving the necessary data from the database were created.

- A second project was created to test how jQuery mobile could be used to create the client side design.

- Finally a third project was created. This project combined the two previous projects into a final project. This project incorporated both the client design with jQuery, the MySQL database and the PHP functions for storing and retrieving data. The final project was when expanded with other necessary functions for Facebook integration, Google maps and geolocation, Google Analytics and other statistics.

6.1 Structure of App

This section explains the structure of the app: How the page (view) structure is organized and how the access to content is organized.

Figure 6.1 shows the color and connector scheme used in the following figures. The color of pages shows the access level. Green is public so everyone can view the page. Yellow requires a logged in user. Red can only be accessed by the owner of the content. The links between the pages is represented by connectors which can either be solid or dotted. Solid connectors are links that are available to everyone. Dotted Connector are only available under some specific condition. Either that the user i logged in or the user is the owner of the content. The page symbol with multiple pages on top of each other resembles that many different pages of the same type is available. Example: The application contains many tasks therefore it has many task pages.

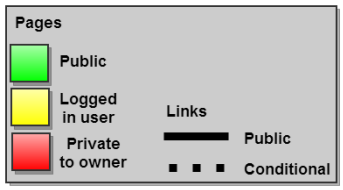

Figure 6.1: Symbol explanation

Figure 6.2 shows the different pages which the application consist of and how these are connected by links. The figure also show the application menu which is always available to the user. The menu consists of a bottom and a top menu. The figure shows an overview of the application. The bottom menu links to 4 other pages. These pages contains the main functions: overview, create task, search and news. The "extra" button in the top menu links to less frequently used pages: profile, feedback, statistics, project info, contact and terms of service. Most of the pages in the app has an "info" button which opens an overlay window. This window contains additional instructions to aid the user in using the app.

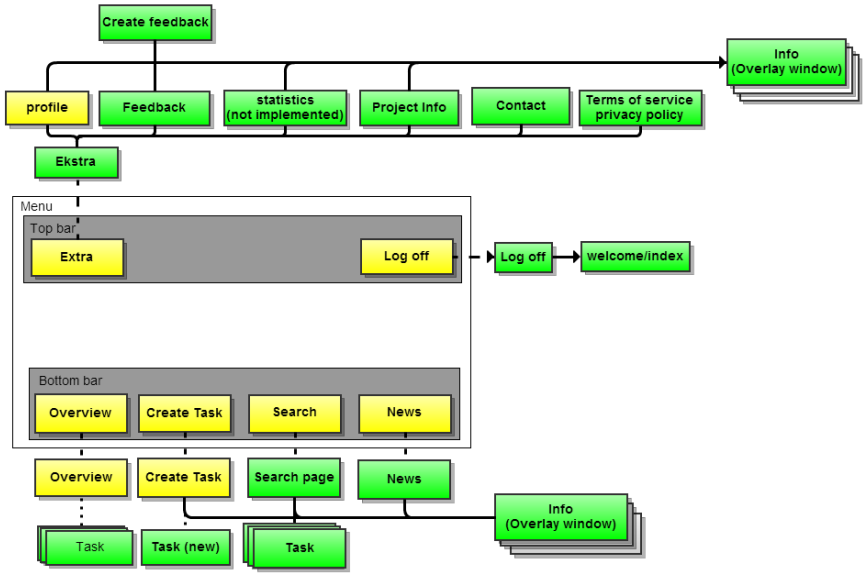

Figure 6.2: Menu structure

Two of the pages in the app is very essential to the users. These pages are also much interconnected with other pages. Figure 6.3 shows the structure of these pages. The profile page is a private page only available to logged in users. Only the owner of the profile can edit the profile. The task page it available to everyone but some functions are only available to logged in users like: comment task, view creator profile. Only the owner of the task can edit the task. Both pages are interconnected with many other pages. It is possible to go the the previous page. Which can be a profile page or a search results page etc.

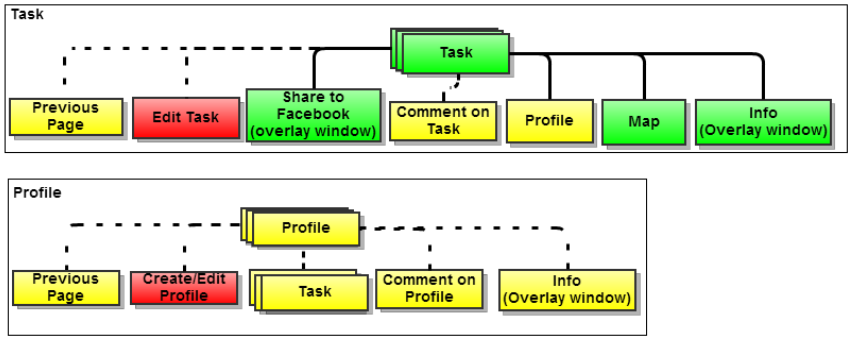

Figure 6.3: Profile and task structure

6.2 Structure of the Individual Page

The individual page that the user sees in the browser consist of HTML, CSS and JavaScript. The page originates from the server where it was a *.php file. The PHP file is transformed into HTML and served to the client. The PHP files on the server which are served to the client side all has the same structure.

The general file consist of many elements it is a mashup of HTML, JavaScript, CSS, jQuery mobile and PHP. Figure 6.4 gives an overview of how the file is constructed. The figure shows the elements that goes into creating the files with user content.

The general file has normal HTML tags: "html", "head" and "body". In addition it has some jQuery tags: "page" and "content". All these markers help the browser and jQuery mobile to segment the file. The general file also consist of content from other *.php files that are included into the main file. This allows for reuse of content. Like JavaScript that are gathered in a single file and included at specific places.

Due to technical reasons the first file included is "commonphp.php". This file then includes "databasefunctions.php" which is necessary to access the server database.

The common includes for the head sections are gathered in the "commonheader.php" file. It contains the following includes: jQuery, jQuery mobile, Google maps API, custom JavaScript's, Google analytics and custom style sheets.

The "body" section contains the content shown to the user. The content is wrapped in a jQuery mobile tags called "page" and "content". These tags are necessary for jQuery mobile to efficiently switch between pages in the app. The top and bottom menu are also marked with jQuery tags. Most pages in the app includes an info button. Which is included from "helpicon.php".

Some JavaScript's works best if they are placed at the end of the page content. These script are gathered in the file pagebottomscripts.php. Which makes it possible to include them at the end of each page.

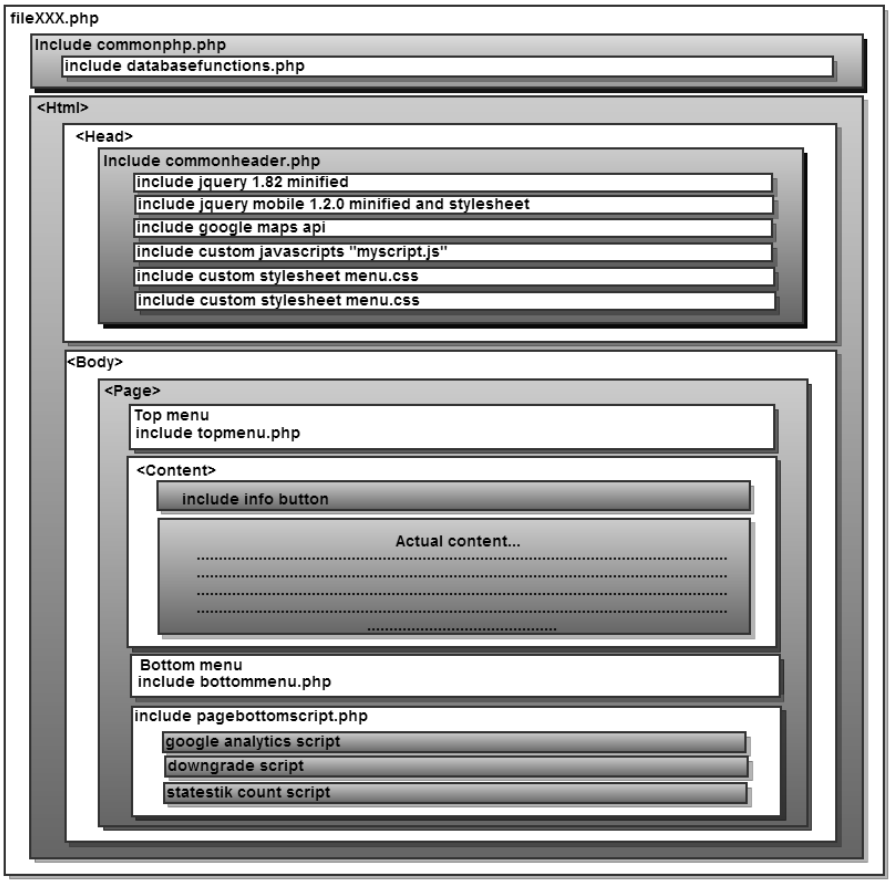

Figure 6.4: Structure of client side view pages

6.3 Interaction between client and Server

Figure 6.5 shows the interaction between the client view pages and the server side PHP files. The client side pages sends post request to the appropriate server side files. The data received from the post request are then forwarded to by calling the appropriate functions in "databasefunctions.php". "Databasefunctions.php" contains all the functions that takes care of handling the data and storing data into the database.

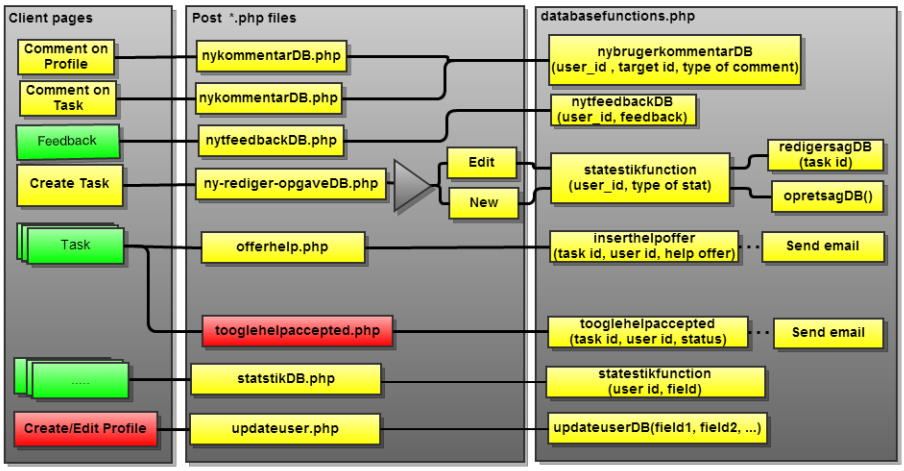

Figure 6.5: Data posted to database

6.4 Database Design

The database has been built with MySQL. The database uses the MyISAM table system. Which is said to be fast and simple to use. On the downside it doesn't allow for constrains like foreign keys. The two most popular table system are MyISAM and InnoDB. A comparison of the two are available here [31].

Normalization
The database scheme have been designed using this guide [32]. The guide recommends a technique called normalization. The technique basically consists of four steps.

1. Make a list of the data that needs to be collected.
2. Remove repeating information and gather information in tables.
3. Assure that the table columns relates entirely to the table key.
4. Look through tables to see if they can be broken down to smaller entities.

Database table Structure

Figure 6.6 shows the database design. The figure shows all the tables of the actual implementation. The connections between the tables are virtual, meaning it is not real constrains. They nearly show the intended connection between the tables. All the table columns are not shows in order to keep the figure small enough to fit one page.

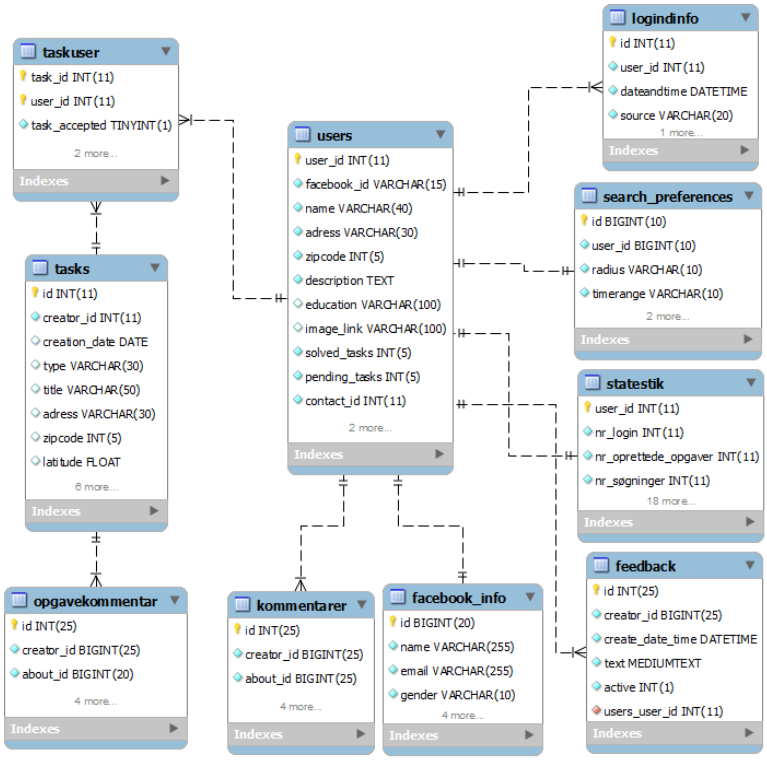

Figure 6.6: Database structure

The database contains the following tables.

"users"

Contains all the users. It is the center of the database. It has a column

called "User_id". "user id" is referenced by most other tables since most data relates to a user. These references are shown with the dotted lines connecting "users" with: "logindinfo", "search preferences", "statestik", "feedback","facebook info", "kommentarer" and "taskuser". The connections are either a 1:1 connection or a 1:Many connection which is defined by the line endings.

"tasks"
Contains all the tasks created by the users. The "tasks" table is connected to: "users", "taskuser" and "opgavekommentarer".

"taskuser"
Contains the connections between "user who has offered to to help with a task" and "the task". This table creates a many to many relationship between "users" and "tasks". A user can offer to help with many tasks and many users can offer help with the same task. The column "task_accepted" is a boolean showing whether or not the task creator has accepted the help offer from another user.

"opgavekommentar", "kommentarer" and "feedback"
The three tables contains comments posted by the users. Each table stores comments of a specific type. Either comments made about a task, a user profile or about the app.

"facebook_info"
Contains information retrieved from Facebook. A row of data is stored when a user profile is initially created. This data can't be changed or deleted by the user. Storing the data has two purposes: 1. The Facebook id is a link to the users Facebook node. 2. The data is the only presumably true info available about user that isn't editable. So if the user ever commits an illegal acts the data can be handed over to the police. This is a simple way of tracking the user identity. In the future this data can be part of a larger data collection to identify the user.

"logindinfo"
Contains a log of users who has logged into the application. It contains the time and the date of when the different users has logged into the application. This data can help to understand the user behavior. It might reveal patterns in user behavior in general or behavior related to problems with the app.

"search_preferences"
Contains the last used search preferences of each user. This allows a user to keep using the same search parameters when searching for a task without entering them into the app each time. This is important to make the app fast and convenient for the user. It can also help to reveal the preferred search preferences

among all users.

"statestik"
Contains all the statistics gathered about a user's behavior. The table gathers 18 different statistics. All the statistics consists of counting how many times a user has executed a specific action like: login, log out, create task, search for task, view task, view profile, view news, view specific pages.., click info button, offer help, accept help offer, share to Facebook, edit profile, edit task. The data serves two purposes: 1. Learn about user behavior. 2. Use data for gamification to give the user a score calculated from his behavior.

This database design only serves the purpose of the prototype application. The database must be extended to be able to serve the purpose of a full application with all the user actions presented earlier. During the project it has not been attempted to optimize on the database. It is definitely possible but not important for a prototype in regards of speed or size.

6.5 Search Page

This section explains how the search page is implemented. This covers both the client and server side. The search page allows the user to search for task in the database. The user can set three parameters: distance to task, time until task, type of task.

Init Search Page
Each time the user visits the search page the procedure shows in figure 6.7 is executed: User location is acquired, Google maps API is loaded, a map is created, a search is conducted. The results from the search are shown on the map and as a list. This allows the user to get instant satisfaction from accessing the search page.

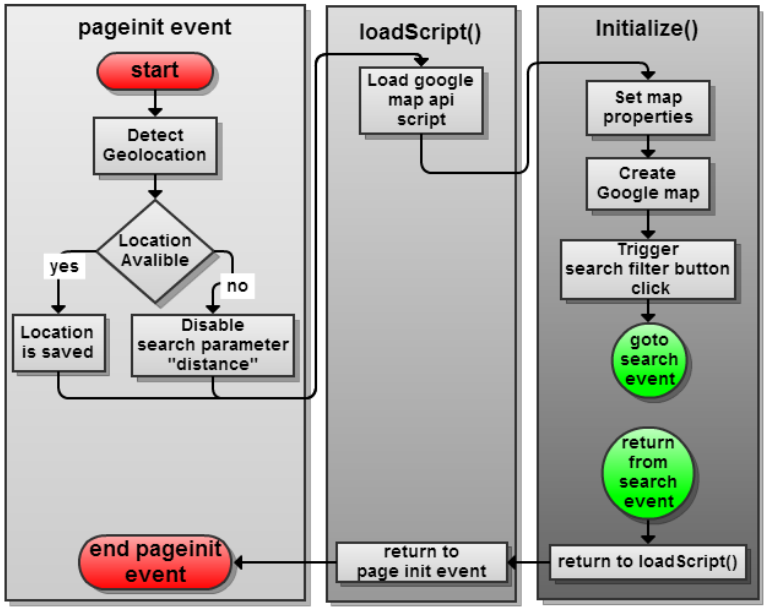

Figure 6.7: initial search page procedure

Search Event

When the user or the app triggers the search button. The following event is triggered. Figure 6.8 shows the actions carried out on the client (JavaScript) and server (PHP).

The client JavaScript acquires and checks the search parameters, shows the user a wait message and posts the parameters to the server. The server script then translates the parameter values to values comparable to the ones in the database, a query is performed in the database using the transformed parameters, the tasks found are then used to create an HTML list, the list is returned to the client side, the client page is updated with the HTML list and the Google map is updated with markers corresponding to the tasks.

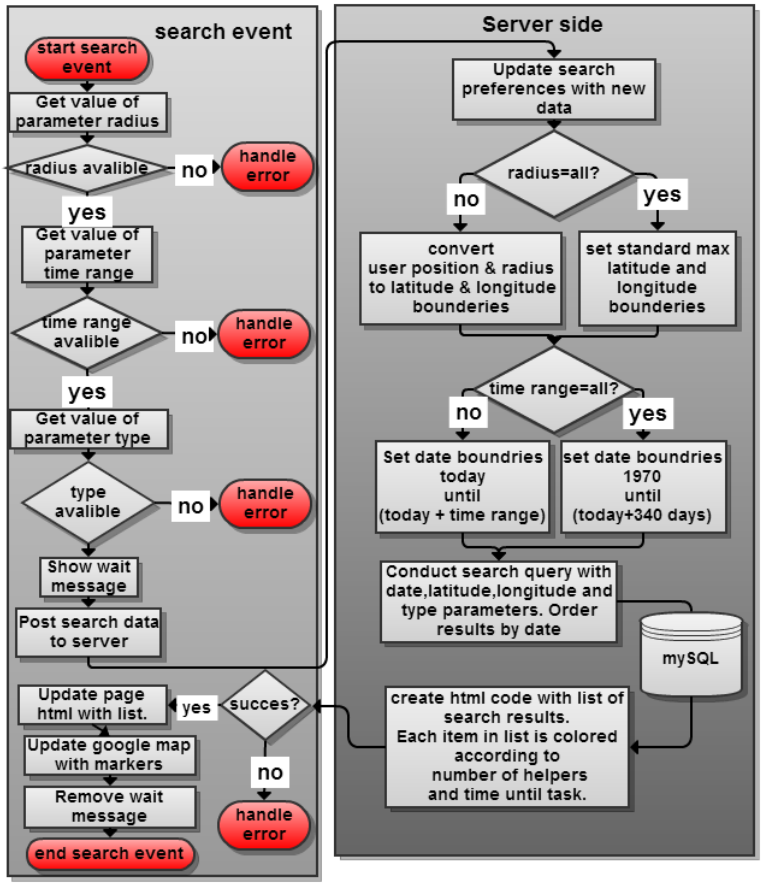

Figure 6.8: Search procedure on client and server

6.6 Facebook Login Process

This section explain how the login process works and how it is implemented. The basic method and implementation for the login comes from an online tutorial. [33]. The login script is located in the file "fbconnect.php" the script requires Facebook PHP SDK to work which is located in the files "facebook.php" and "base_facebook.php"

The login process serves several functions.

- It authenticates the user through Facebook. Creating an easy and safe way for logging into the app.
- It collects the necessary permissions from users to let the app connect with the users Facebook profile.
- It creates a user profile for new users. Where most info is gathered from their Facebook profile.
- It creates a PHP server session for the user. Giving the user a seamless experience of being logged into the app.

Figure 6.9 shows the login process in "fbconnct.php" script. The script is initiated when a user enters the index/login page. The script basically check 3 conditions in the following order:

1. Does a user session exists?
2. Is the users logged into Facebook?
3. Is user created in app database.

Depending on the results of these checks the script will perform various actions to assure that the user is eventually logged into the app. During this process the script will update the database and the session data.

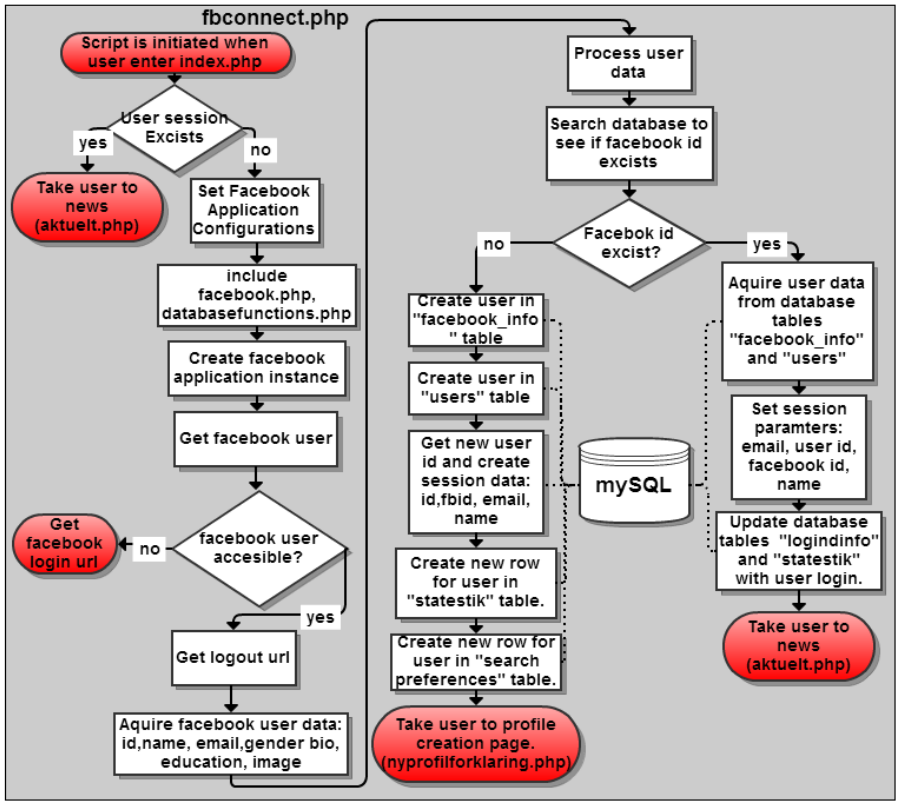

Figure 6.9: Facebook login procedure

6.7 Facebook Open Graph Integration

In order to promote the app it has been tightly integrated with Facebook. The app shares and integrates some of the user generated content with Facebook. This is done by creating open graph object and action in the Facebook open graph corresponding to what the user creates in the app.

An object called "task" was defined and two actions called "helping with" and "create" was defined. This allows the app to share stories to Facebook stories like "Christen Christensen 'helped with' a 'task' 'cleaning the floor'. This is a good way for other user to learn about the existence of the app and understand how it functions.

Whenever a user creates a task in the app. The task is also created as an object on Facebook. Whenever a user offers to help with a task a similar action is created on Facebook. These objects and actions are then distributed to the Facebook users news feeds.

The following section will explain the process of integrating the app with the Facebook open graph. I used Facebook's own tutorial for implementing the functionality. [34] The following steps were taken.

1. The publish_actions permission was added to the list of permissions that a user were promoted for at login.

2. The actions and the object were Defined in the Facebook app. For each action or object a form was filled in, in order to get approval from Facebook. The names of the actions and object was defined in English to ease the procedure.

3. Each Facebook object needs a corresponding object page in the web app. The object page has to contain some specific meta tag declared by Facebook. This was solved by including the meta tags into the existing task page. Whenever a task page was loaded the corresponding meta tags was included into the page. This was accomplished with a function called "opretfbopgave()".

4. The defined actions had to be implemented into the web app. So when a user either helped with a task or created a task. The actions would be reported to Facebook open graph. This was accomplished with two new functions called "fbactioncreate()" and "fbactionhelp()". That extended the existing functions "opretsagDB()" and "inserthelpoffers()".

5. Finally the actions and objects were submitted for approval and eventually approved by Facebook after some corrections. Which means that the actions and objects can be used/posted to all user on Facebook.

An overview of the mentioned function can be seen in figure 6.10

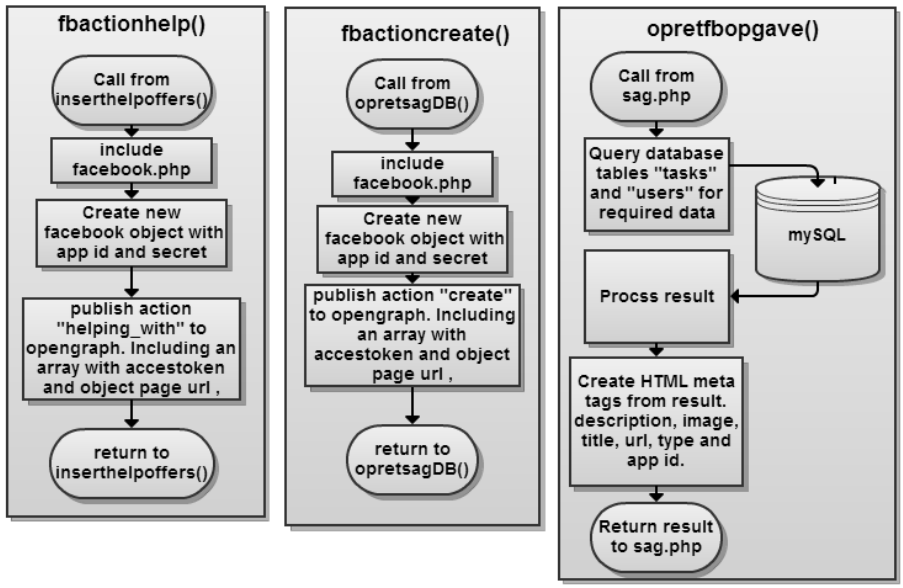

Figure 6.10: Facebook open graph integration

6.8 Video Implementation

The app allows the user to view videos which explains the different functions in the app. This is a very convenient and easy way for low tech user to learn how to use the app. The videos are hidden away in the app. The user must first click an info icon for a pop up window to appear. The pop up window contains an embedded video. The user then have to press play in order to watch the video. The video will never start automatically and surprise the user since this might be inconvenient.

IFRAME and Object Tag

The video clips are hosted at YouTube.com and embedded into the individual pages in the app. For the video playback to work in as many browser as possible and for the video to work in the best way some additional code were added.

The videos are part of each page with a standard <IFRAME> code snippet collected from YouTube. This is the way that YouTube recommends embedding the videos. This allows for YouTube to serve the videos in an IFRAME. YouTube can either serve the browser a HTML5 or flash video depending on what the browser supports. The IFRAME method also supports some advanced options for controlling the video playback. YouTube has an older tag for embedding videos called <object>.

Unfortunately some browser doesn't support IFRAMES due to some security risks that is introduced with the cross domain communication through an IFRAME. This includes the popular browser IE7, IE8 and IE9. These browsers most be served the video in an <object> tag. For this reason it is necessary to use a feature detection script to serve the appropriate video tag for the different browsers. The feature that is detected is called CORS (Cross-origin resource sharing). I found a code snippet which detects this feature at stackoverflow.com[35]. This code has then been transformed to fit my needs and is implemented in the script called "downgrade.js" which is included in all pages with video.

Pop Up Window

The embedded video has been placed in a pop up window that appears when the user clicks an info icon. This is an appropriate place to embed the video since it is rarely used. Unfortunately it creates some problems. Android 2.3 has a bug that causes the video to not display probably and Android 2.3 is very widely used. A fix for this is located in the jQuery mobile documentation at [36].

This fix has been adopted into the code that takes care of manipulating the embedded videos. It is part of "myscript.js". The fix is composed of jQuery event that are triggered when the pop up window opens and closes. These triggers are used to resize the IFRAME video. This allows the video to be displayed correct.

Another problem with using a pop up window is that the video keeps playing when the user closes the window. This has been solved by adopting a solution found [37]. It offers a JavaScript function that can start, stop and pause a video. This function is called to pause the video when the user closes the pop op window. The function is implemented in "myscript.js".

Using these different fixes and combining them allows for a smother user experience using the embedded YouTube video within a pop up windows in jQuery mobile. The only remaining problem is that the videos embedded into IE with the <object> tag doesn't pause when the pop up window is closed. This feature still needs to be added.

Chapter 7

Test of App

This section describes and analyzes all the results which have been collected from testing the prototype app. For the app prototype the following Software component versions has been used.

- Jquery v. 1.8.2
- Jquery Mobile v. 1.2.0
- Google Maps Javascript API v.3
- Youtube YouTube API v2.0
- Facebook PHP SDK v. 3.1.1.
- MySQL Client API version 5.1.68
- PHP Version 5.3.21

7.1 Portability

This section documents how well the app works across different browser and smartphones. The browser test was done with an online service called "browser stack" which offers virtual browser testing.

Test Procedure
The following test procedure was performed with each browser.

1. Logging into app with already created test user.
2. Click "søg" menu button.
3. Click "søg efter opgave".
4. Click a task from the search results.
5. Comment on chosen task.
6. Share task to Facebook. Remove help offer and add help offer.
7. Click "ny opgave".
8. Create task.
9. Click info button.
10. Play video.
11. Close info pop up.
12. Click "overblik".
13. Log out of application.

During the test the following things where observed: Is the general design as intended? Including but not limited to does the special danish sign "æøå" show?, are buttons rounded? (is CSS3 supported), does the top and bottom menu bar stay in place, does the embedded videos act as intended, does the app features respond as expected?

Browser Test results
Table 7.1 and Table 7.2 documents the test result. Each test setup features a list of errors that occurred during the test procedure. If nothing is noted the test proceeded without any errors.

BrowserStack		
Browser	**OS**	**Resolution**
IE6	Windows XP	1024x768
• Jquery mobile is not working at all so test is skipped.		
IE7	Windows XP	1024x768
• No rounded corner(CSS3). • Problems with Facebook sharing. • Video not supported. • Images and "date field" are displaced.		
IE8	Windows XP	1024x768
• No rounded corners (CSS3). • Degraded to <Object> video. • Problems with log out function.		
IE9	Windows 7	1024x768
• No problems.		
IE10	Windows 8	1024x768
• Problems with log out function.		
Firefox 4.0	Windows XP	1024x768
• Show graphics but doesn't update graphic properly. Test skipped.		
Firefox 5.0 - Firefox 19.0	Windows XP	1024x768
• Problems with the log out function.		
Chrome 14.0 - Chrome 24.0	Windows XP	1024x768
• No problems.		

Table 7.1: BrowserStack first part

BrowserStack		
Browser	**OS**	**Resolution**
Safari 4.0	Windows XP	1024x768
• Doesn't show danish signs. • Site needed to be reloaded two times during test. • Problems with log out function.		
Safari 5.0	Windows XP	1024x768
• Doesn't show Danish signs.		
Safari 6.0	OS X Mountain Lion	1024x768
• Video doesn't stop playing.		
Opera mini	Windows XP	1024x768
• Doesn't show menu bar correctly.		
Oera 10.0	Windows XP	1024x768
• No video.		
Opera 11.1	Windows XP	1024x768
• Minor graphic error with CSS3. • No video.		
Opera 11.5,11.6	Windows XP	1024x768
• No video.		
Opera 12.0	Windows XP	1024x768
• No problems.		

Table 7.2: BrowserStack second part

During the browser test, it was noted that "browser stack" could not be used for testing the geolocation feature. So afterwards most of the browsers were tested again to see if the geolocation feature was working. Which it did. In general all mentioned browser should support geolocation except IE7, IE8, opera 10, Safari 4. [38]

Smartphones Test Results
The same test procedure was applied to a range of smartphones to see how the app worked on different phones.

Smartphones		
Browser	**OS**	**Phone**
Stock Browser	Android 4.1	Samsung Galaxy S3
• Sharing to Facebook is buggy. User must touch screen before app appear again. • Remove and add help for tasks function doesn't work. • When filling in the date field while creating a task. The browser crashes. • Facebook login screen requires user to zoom.		
Chrome	Android 4.1	Samsung Galaxsy s3
• No problems.		
Stock Webkit 3.1	Android 2.2.2	HTC Desire
• Danish signs doesn't show. • Facebook share has minor bug. Screen keyboard must be removed before a task can be shared. • App had to be reloaded two times. • Problems with log out function.		
Stock Webkit 3.1	Android 2.3	HTC Desire
• No problem.		
Stock	iOS 6.0	iPhone5
• Video failed.		
Stock	iOS 5.0	iPhone3GS
• Didn't show danish signs	• Bottom menu moved	
Stock Browser	Android 4.04	HTC one X
• Facebook share didn't work properly.		
Stock Browser	Windows 7.5	Nokia Lumia 900 and Samsung Omnia 8
• Facebook share was buggy. Did share but didn't transfer user to app. • Bottom menu moved. • Geolocation failed. • Video had to be played with native app.		

Table 7.3: Smartphones

Genral Problems Discovered
In general the app worked on almost all browsers and smartphones tested. Especially the new browsers. The following general problems were observed.

Major problem that should be fixed:

- Several browser couldn't show the danish special signs (æøå) including safari4, safari 5 and the android 2.2.2 stock browser. This is a problem which can be fixed.
- The log out function doesn't work each time. This problem is not related to a specific browser.
- IE8,IE9 didn't auto pause video when info window was closed. Due to <Object> video.
- In general user had to press search button before user location was shown.
- The Samsung galaxy S3 stock browser had many major problems with the app. This should be examined.

Minor problem or problems not fixable:

- IE7 and IE8 doesn't support CSS3 which makes the graphical user interface look outdated.
- IE7, Opera 10, Opera 11 could not show video. This is not a major problem since these browser are less popular.
- The function for sharing to Facebook didn't work on IE7 and didn't work probably on Android 2.2.2.
- Geolocation not working in IE 7, IE8, Safari 4.
- Windows phone 7.5 doesn't show jQuery elements properly. This is not fixable.

Discussion of Results Lets examine the statistics from section 2.6. These statistics show the distribution of internet user on different browsers and mobile phones.

IE9, IE8, Chrome 22, Chrome 23, Safari 5, Safari 6. account for 81,3% of the total data traffic ("shown pages"). The app works well in these browsers.

In addition to the browsers mentioned. It can be seen that 13.1 % of the traffic comes from a "webkit mobile x.x" browser which cover mobile phone browsers mainly originating from the browsers on Android and iOS. The app have been tested on several Android smartphones and iPhones. It is reasonable to believe that the app for the most part work on these systems.

The test has shown that the app works on all the popular browsers and smartphones. The result shows that the chosen technologies are right for the purpose of making the app available to all platforms. It might still be necessary to tweak the app to work on specific browsers or to make it work optimal but it is in general a satisfying result. Even if some problems are left.

7.2 User Feedback

There hasn't been conducted a structured user experience test but approximately 45 people did create a user profile in the app. Some of these user did give a valuable oral feedback from which the following point were noted.

- **Feedback:** Many users didn't complete their profile creation. Several users gave the explanation that they intended to do it later. Out of the total 44 users only 15 entered their email address and other extra info. It is good that the app automatically creates some of the user profile from Facebook info.
  improvement: The profile creation procedure should be changed to concist of several stages. First part should be mandatory and the second part should be voluntary so the user can be asked to complete it later.
- **Feedback:** Certain users what used IE experienced problems in the login process. This was due to the fact that IE went into "quirks mode" when users were transferred from the Facebook login back to the app. The app doesn't work in quirky mode so the users couldn't complete there profile. The users then had to reload the page which made IE go out of quirky mode but the profile creation step had been skipped. This error was fixed so IE didn't go into quirky mode.
  Improvement: Create database variables which keeps track of the user profile creation procedure.
- **Feedback:** Several Users didn't understand the concept of a "task". They didn't know what kind of task they were allowed to create for the same reason they didn't create any tasks.
  improvement: As suggested earlier the app should have templates for the tasks. This will inspire the users.
- **Feedback:** Users found that the app is quite empty not enough tasks or users.
  improvement: The app is in need of more resources. These resources be available if organizations or dedicated volunteering resources were supporting the app.

- **Feedback:** Some Users didn't understand the whole concept and didn't know what to expect from the app when they saw the welcome page.
  improvement: A better explanation of the concept especially at the front page.

- **Feedback:** Some User don't like Facebook login mechanism because it violates their privacy.
  improvement: Create an alternative login.

- **Feedback:** Some Users chose not to give all the permits which Facebook asked for. For that reason the app design must be able to handle this situation without breaking down.
  improvement: Stop asking for the following permits: email, birthday, education. These permits rarely offers any useful data from Facebook. The users will when fell that they are giving less private info.

- **Feedback:** Users didn't complain that the app was posting to much on Facebook. Which could indicate that the app could potentially post more info to Facebook.
  improvement: Create a post on user Facebook timeline the first time the user tries the app.

The collected oral user feedback has been analyzed and a range of improvements to enhance the user experience has been suggested in this section.

7.3 Unit Testing

The different units/functions in the app were all tested individually. IE9 was used for this since IE9 has proven to reveal many mistakes in the app since IE is quite sensitive to minor errors. Another reason is that IE9 scores low/bad in a HTML5 browser test [39]. IE9 is therefore likely to reveal if an app feature are not widely supported. The tests were done on a Windows 7 machine with a screen resolution of 1600x900 with a 10Mbit internet connection.

The tests revealed the following problems with the app prototype.

- **Problem:** The user "login" feature freezes once in a while. The user then have to reload the page and try again. It is not clear what the reason is.
  Improvement: The login script should be rewritten it is not complete.

- **Problem:** The user "log out" feature freezes once in a while. The user can't log out of the app. It seems to be because the user in automatically logged into the app before the session data can be deleted by the server.
  Improvement: The login script should be rewritten it is not complete.

- **Problem:** In some cases the app is showing an incorrect number of people who have volunteered to help with a task. This is possible because the number is originating from the client side of the app. So if a error occurs at the client side it affects the number of helpers in the database.
  Improvement: The number should be calculated at server side without any client interaction.

- **Problem:** When a user visits the search page. The user is presented to a quick search result but the user location isn't always shown. This is due to the fact that the user location isn't available when the site is loaded. Therefore the user must conduct another search to include his own location.
  Improvement: This could be fixed in several ways and must be fixed to give the user a smother experience.

  The unit testing has revealed several problems. These problems has been analyzed in order to suggest possible solutions.

7.4 App Database

The section analyzed the statistic data gathered about the user behavior. The data is gathered from the apps own database and has been analyzed in the following manner.

The data was exported from the database to a spreadsheet. The data which originated from "the developers user" and "non real test users" were removed from the data set. The rest of the data was then analyzed. 45 people tried the app of which 32 are people are associated with the developer. The source data for figure 7.1 , 7.2 , 7.3 and 7.4 can be found in Appendix. B

Facebook Info Table

The database table containing the data gathered from Facebook reveals that some of the columns are empty or full of useless data. The data was manually inspected to examine the number of cells with useful data in a specific column. The following criteria where used: did it contain a real name?, did it contain a a non standard FB email?, did it contain useful education info?, did it contain personal info in the description?

Figure 7.1 shows that "name" and "email" are useful to gather from Facebook but "description" is problematic or useless. The field called "bio"(description) contains bizarre quotes. The app data gathering of education has an error which has caused the education data to be missing.

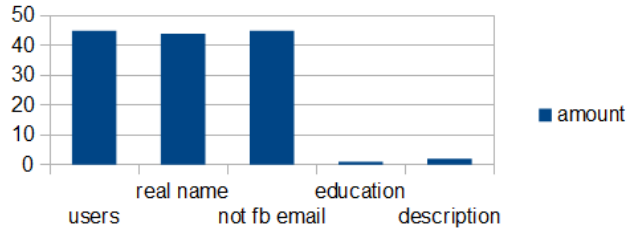

Figure 7.1: Gathered Facebook data

User Profile Table

The database table containing the user profile data reveals how many user actually filled in the fields during the user profile creation. Figure 7.2 shows that approx 15 out of 45 users filled in their profile properly. It can also be seen how many user filled in: "email", "address","zip code", "education", "telephone number". The data suggest that either a user filled in the profile completely or the user skipped it completely. The reason for the high number of people who filled in description is that the field was auto filled with Facebook data.

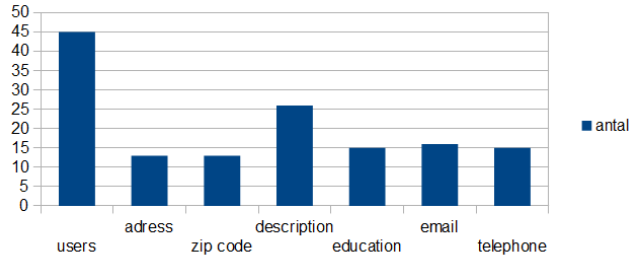

Figure 7.2: User profile data

Search Preferences Table

Figure 7.3 shows the distribution of the search preference "type" among the users. Only users who actually used the search function has been included in the data. It seems that the users are divided almost equally into the different categories.

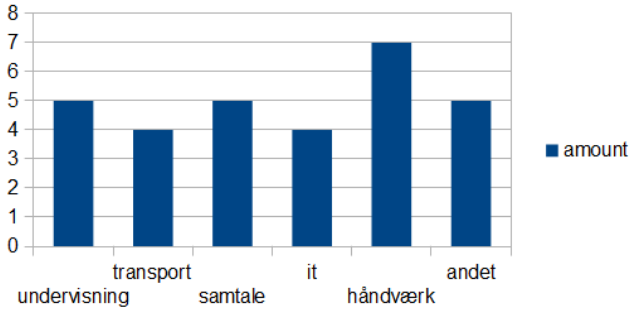

Figure 7.3: User search preferences

User Statistics Table

Figure 7.4 gives a general picture of user behavior. Data has been gathered from the table "statestik" in the database. This table contains statistics on each individual users. The table reveals how many times a user has visited a specific page or used a specific function in the app.

Number of profiles	42	
	absolute	per profile
logging in and out		
log in	62	1,48
log out	15	0,36
pages shown		
News	72	1,71
create task	30	0,71
overview	59	1,4
extra	64	1,52
Tasks	71	1,69
Profiles	56	1,33
functions used		
info button	15	0,36
FB share button	2	0,05
search button	111	2,64

Figure 7.4: User statistics

42 users where included in the data set. The table shows both the absolute and the relative numbers for each statistic.

It can be seen that the average user only logged into the app 1.5 times and mainly didn't use the log out function.

It can be seen that the average user visited each page between 1.3-1.7 times. Except from the create task page which was only visited 0.7 times. This basically suggests that the user clicked the different buttons and left the app.

Most users used the search function. The data suggest that each user tried the search function 2.6 times. Due to the implementation a typical search will double the number logged searches so actually each user probably used the search function 1.3 times. Which fits the other data.

The share to Facebook function was used two times and the info button was used 15 times in total. It is to be expected that users didn't want to share to Facebook. It seems odd that new users wouldn't want to use the info button. This could suggest that users didn't notice it.

7.5 Facebook Insight

Facebook insights gathers all the data which is generated from the app being integrated into Facebook. The data is anonymous. It allows the developer to review the app performance. How well the app is doing in acquiring and retaining users. The data from Facebook Insight has been reviewed and the useful data is presented here.

User Retention
From figure 7.5 it can be seen that no users have removed the app from Facebook. A lot of users have changed from being active to being stale. Which means that users aren't using the app actively. Both facts are important in improving the app. The app is not annoying user so they aren't removing it but it is neither fascinating the users so they aren't using it.

Facebook insights also showed that the app hadn't been blocked or marked as spam by a single user (Data not shown here). This means that the app has leverage to post more data to the users Facebook profile.

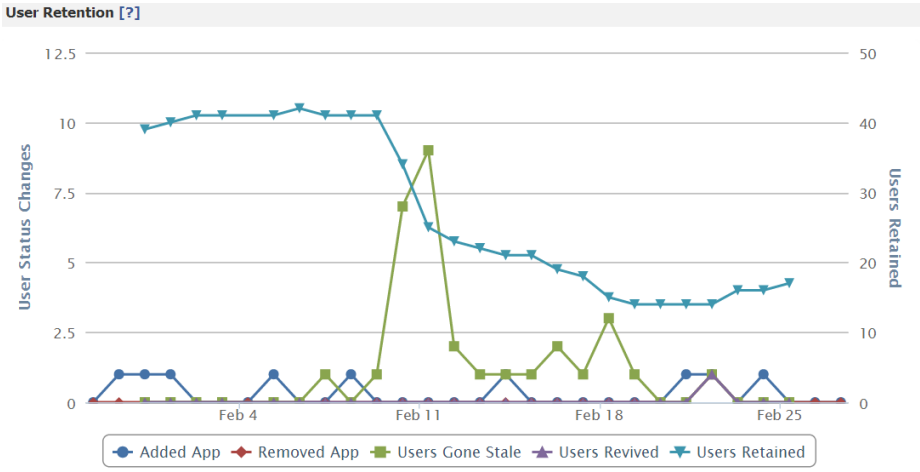

Figure 7.5: FB user retention (screenshot from FB insights)

Facebook Permits

Figure 7.6 shows the click through rate for permission groups. Does the user actually grant the app the permissions which it asks for? In general only 68% of the users goes through with the procedure and becomes users and only 58% of the users grants the app the "publish_stream" permit needed for posting object and actions to open graph. These results are not satisfying. They show that many user don't like to share their Facebook profile. It confirms need for an alternative login that doesn't require access to Facebook.

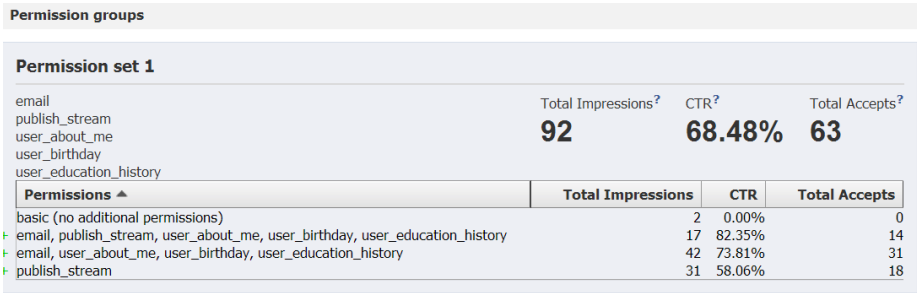

Figure 7.6: FB user permissions (screenshot from FB insights)

Click Through Rate

Figure 7.7 shows what happens when an app action is published to Facebook's open graph. 37 actions have been published. Most of these actions are only test actions and doesn't contain real data. It can be seen that these actions have generated 1448 impressions shown on either a news feed,ticker or timeline. The impressions have generated 61 referrals to the app.

These data shows why it is important to integrate the app with Facebook open graph. Facebook has done more advertising than the developer of the app has. In the future the app should be optimized to create even better Facebook stories to create an higher Click through rate (CTR).

API Request Time

Figure 7.8 shows that the average API request time is around 100ms and in worst case scenario the request time can be 800 ms. These data are important in selecting whether the Facebook API request from the app should be allowed to block the app or not. An average waiting time of 100ms in connection with offering help or creating a task i acceptable but not optimal. The data can in general be used in connection with client side speed tests.

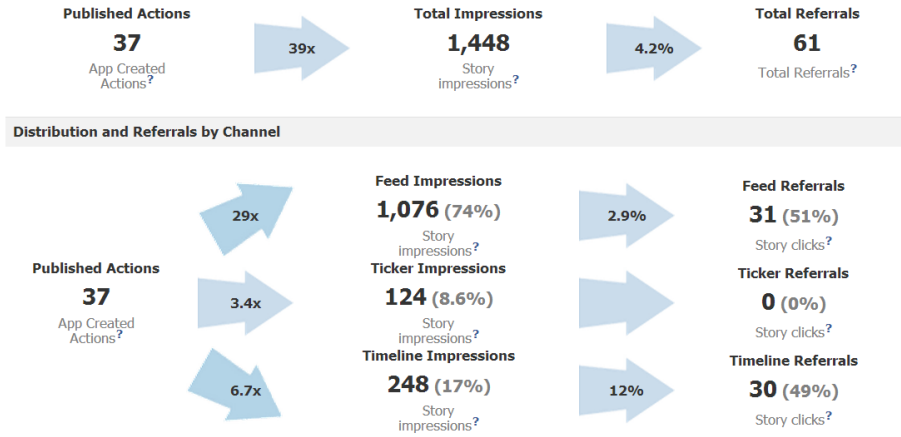

Figure 7.7: FB open graph actions (screenshot from FB insights)

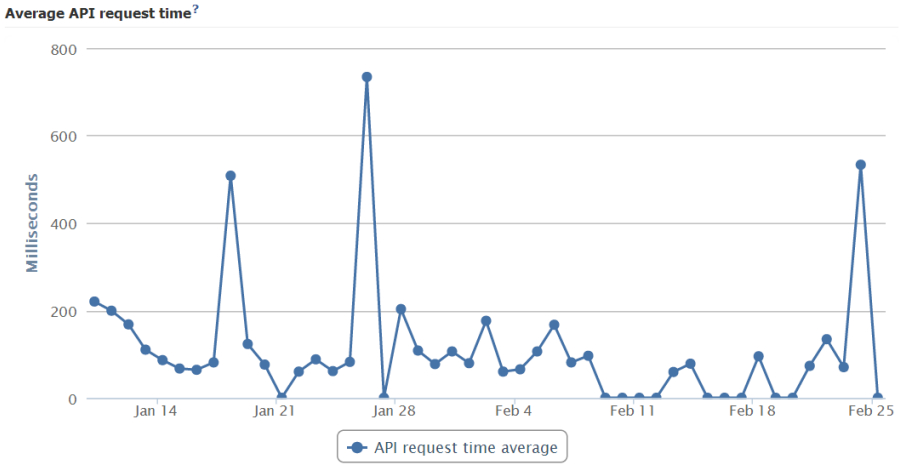

Figure 7.8: FB API request time (screenshot from FB insights)

Chapter 8

App User Guide

This section describes how the app works. This section emphasizes all the main features. The screenshots in this section are taken form a computer in a custom browser window. The app will look somewhat different when running in a normal browser. The screenshots resembles the look of the app running on a smartphone.

This chapter has the following sections. Which explains a range of user actions.

- Logging Into The Application.
- Creating a User Account.
- Profile Page.
- Creating a Task.
- Searching for a Task.
- Task Page.
- Helping With a Task.
- Accepting Help From Others.
- Overview of Commitments.
- Learn How to Use the App.
- Commenting a Profile or Task.
- Extra View.

8.1 Logging Into the Application

The user logs into application by clicking the Facebook login button see Figure 8.1. Existing users will be taken directly to the news page. New users will be taken to a profile creation page.

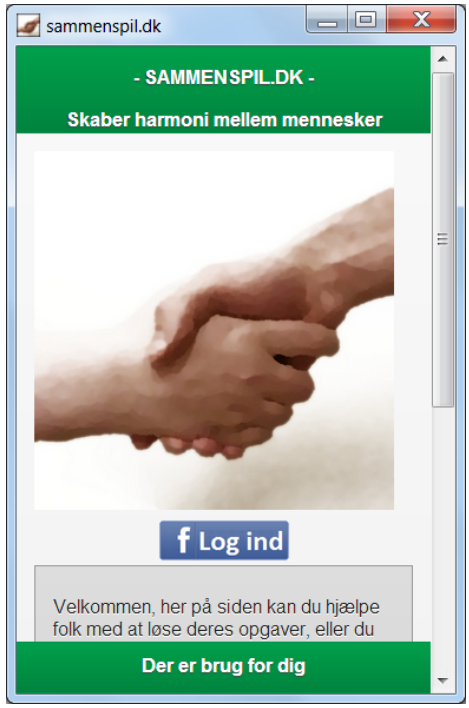

Figure 8.1: Welcome page with login

The first part of the profile creation procedure is to give the app access to the users Facebook profile. Figure 8.2 shows the first step where the user must login with a Facebook profile. Figure 8.2 shows the second step where the user accept to give the app the required permits. Figure 8.4 shows the third step where the user gives the app a permit to post messages to Facebook on behalf of the user. When the Facebook authorization procedure is over the user is transferred back to the app to create the rest of the users profile.

Figure 8.2

First step in Facebook procedure

Figure 8.3

Second step in Facebook procedure

Figure 8.4: Third step in Facebook procedure

8.2 Creating a User Account

When a new user logs into the application he is first transferred to a Facebook authorization procedure afterwards the user is transferred to the app profile creation procedure. This procedure consists of two steps. First step is a page explaining to the user how to create a profile see figure 8.5. The second step is a page containing a form which the user must fill in see figure 8.6. The user must fill in: name, address, zip code, education, user description, email address, phone number (optional).

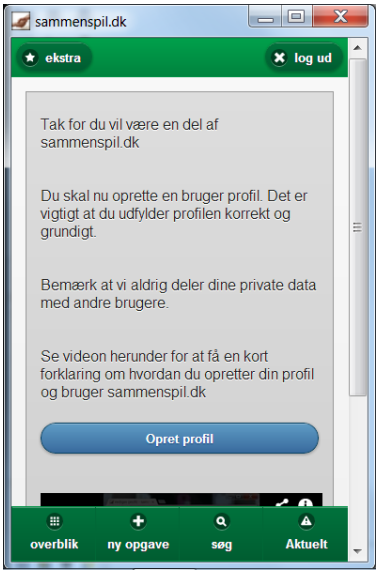

Figure 8.5: Instructions

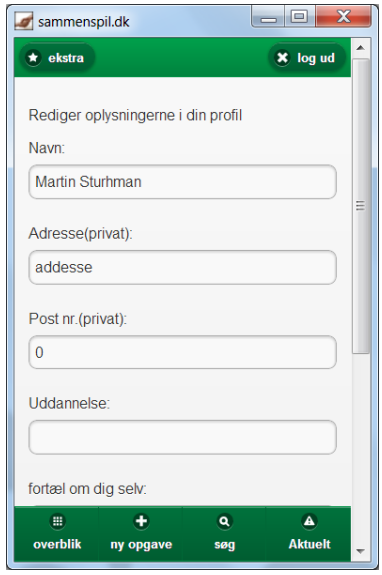

Figure 8.6: Profile creation page

After the profile creation has been completed the user it transferred to a profile page showing the created profile. This allows the user to see how his new profile looks to other users.

8.3 Profile Page

The profile page shows the following information: profile picture, profile description, created tasks, profile comments. It also shows the user stats like: How many tasks has been created, how many times has help been offered, tasks shared to Facebook. It also has a edit user profile button. It should be noted that the profile page looks slightly different depending on whether the user is viewing his own profile or another user profile (The edit function is only available on a user own profile).

Figure 8.7: User profile page

Figure 8.8: Users tasks

The user can press the "opgaver" or "kommentarer" bar to expand it. Then all the tasks or comments are shown. This is a useful feature in assessing that to think of a user. What kind of tasks has the user created? what kind of comments has other users made about this user? It also a useful feature if you already have helped a user and you want to find more tasks to help the user with.

8.4 News Page

The news page is the page which a user is transferred to after logging into the application. The purpose of this page is to keep the user updated with news about the app. This is an important instrument since it can inform the users about: new features, warnings, problems, contests etc. This is also why it is the first page that the user sees. Since this page is important it is placed in the bottom tab menu.

The user logs into application by

Figure 8.9: News page

8.5 Creating a Task

This page is an essential page and for that reason it is placed in the bottom menu tab. The page allows the user to create a new task. The user must fill in the following information: Type of task, title, description, address, zip code, time of execution, date. When the user is done filling in the form he presses "gem opgave". If all fields have been filled in correctly the task is saved in the

database. The user is then transferred to a page showing the new task that's been created. The task is now accessible to all users.

The user logs into application by

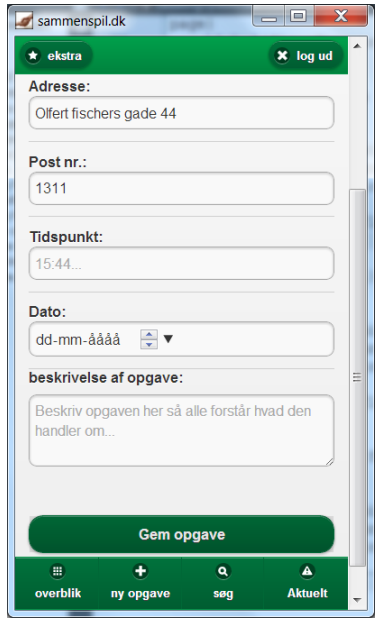

Figure 8.10: Create task page

8.6 Task Page

This page contains a task created a user. The page allows for user to inspect a task to see if they wish to help with it. The page contains the following information: picture corresponding to the task type, task description, address of task, link to map with address, time and date of task, task creator name and link to profile. "Hjælp med ogave" allows a user to offer his help with the task. If the user is also the creator of the task he will have the option to edit the task "rediger opgave". See figure 8.11

If a user has offered to help wit a task is name will be shown in "hjælpere" section. See figure 8.12. The owner of the task can then click the blue square and accept the help. This will tick of the square. When the square is ticked off

Figure 8.11: Task page

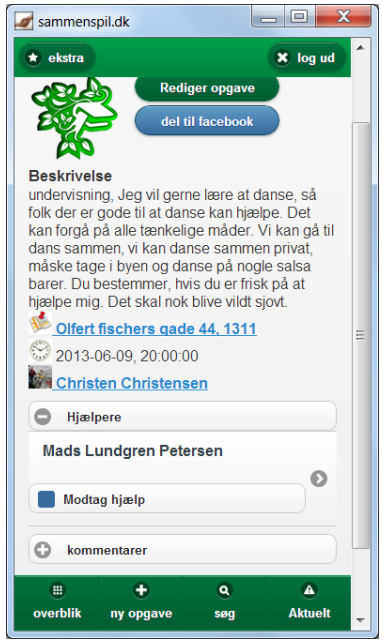

Figure 8.12: Help offers

a message will appear telling the user that a mail has been sent to the helper. See figure 8.13

A user can also comment a task by clicking the "kommentarer" bar. It will expand a section with a "tilføj kommentar" button. The user can then click this button to add a comment. This comment can either be a question or concern about that task. See figure 8.14

The user can click the address of the task. This will open a new page with a Google map showing the address of the task. See figure 8.15.

The "del til Facebook" button allows a user to share the task to his Facebook timeline so other people can view and help with the task. When the user does this a new windows will pop up and ask the user to confirm that he wants to share to Facebook. This window will also allow the user to add a comment. See Figure 8.16.

Figure 8.13

Accept help message

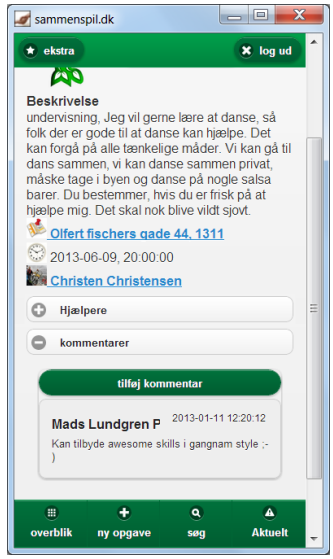

Figure 8.14

Task comments

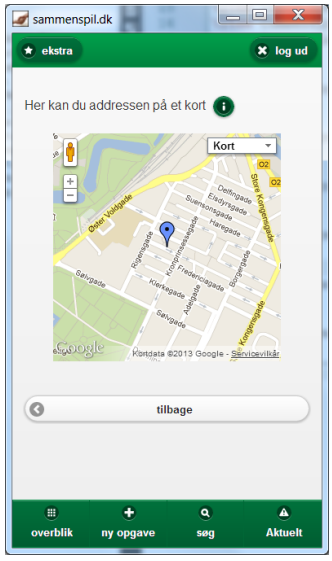

Figure 8.15

Map with address

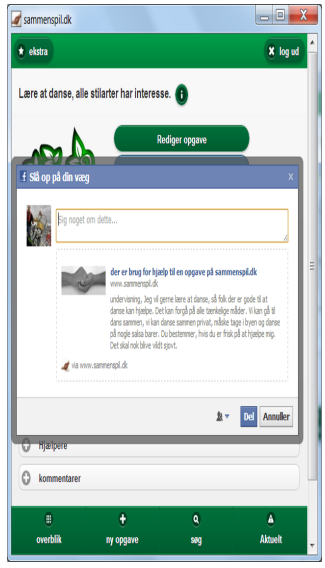

Figure 8.16

Share to Facebook

8.7 Searching for a Task

This function allows a user to search for tasks to help with. The page allows the user to set three search criteria: Distance to task, time interval for task execution, type of task. This allows the user to find a task he wants to help with. After setting the the search criteria the user can press "søg efter opgave" and a search will be conducted. The resulting tasks are then shown. The tasks are presented in two ways: On a map with the locations and on a list form sorted by date.

The map allows the user to get an overview of where the tasks are located. If the user click a pin on the map an overlay will open and show a link with the title of the task. The tasks are shown with a blue pin and the user location is shown with a red pin. See figure 8.17

The search results presented in list form shows some more details. The user can see the date of the task. The color of the date background can either be red, yellow or green depending on the amount of time left until the task is taking place. The task item also shows a circle with a number. The number is the number of people who has offered to help. The color of the circle is either red, yellow or green depending on how many people offered help. The title of the task is also shown. The user can click the task item to be transferred to the task page for more information.

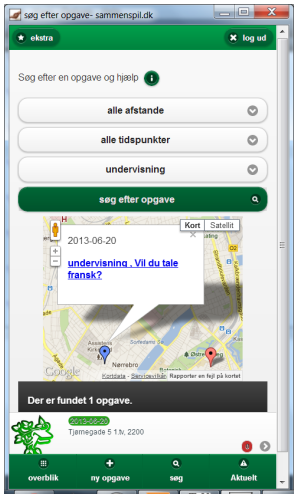

Figure 8.17: Search task page

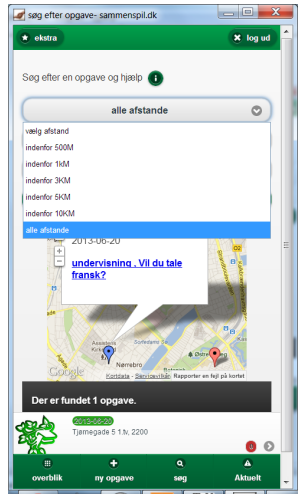

Figure 8.18: Search preferences

The search page allows the user to set three search criteria. Figure 8.18 shows

how it looks when the user presses the "afstand" criteria. The user can now choose the distance from where he is to where the tasks are located. this allows the user to search for tasks that are located close to him. The other two search criteria works in a similar way.

The page is designed to be fast and easy so user shouldn't have to press to many buttons to perform a search. The users search criteria are saved when the user conducts a search so that they can be auto set the next time the user visits the search page. Actually a search is also auto conducted when a user arrives at the page. This means the user will be presented to relevant task results instantly. This is convenient when using the function from a smartphone.

8.8 Helping With a Task

When a user visits another users tasks. The user it presented with the option of helping with the task. See figure 8.19. The user can click a button "hjælp med opgave" to offer his help. The user will then be listed under the bar "hjælpere". The owner of the task will receive a email with the offer. The user who pressed the button will instantly receive a message explaining that a email have been sent. see figure 8.20

Figure 8.19: Task page

Figure 8.20: Offer help message

8.9 Accepting Help From Others

The owner of a task can accept help offer from other users. This is done by entering the task page. Then clicking the "hjælpere" bar to expand it. This reveals the users who offered their help. The owner of the task can now click the blue square and accept the help. This will tick of the square. See figure 8.22. When the square is ticked off a message will appear telling the user that a email has been sent to the helper. See figure 8.13. The owner can chose to accept help from several users.

Figure 8.21

Task helpers

Figure 8.22

Help Accepted message

8.10 Overview of Commitments

The overview page lets the user get a quick overview of his commitments in the app. See figure 8.23. The page shows the tasks the user has committed to help with and the tasks that the user has asked for help with. This overview page is a quick and easy way for the user to stay updated on the status of the tasks that he must pay attention to. The page is located in the bottom tab menu because it has an important purpose and is often used.

The "jeg hælper" section allows the user to get a lot of important info quickly.

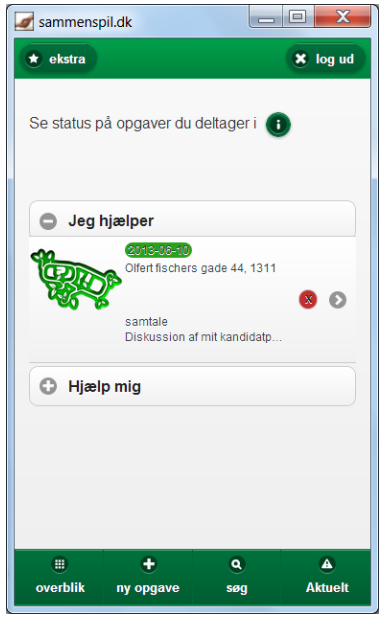

Figure 8.23: Offering help

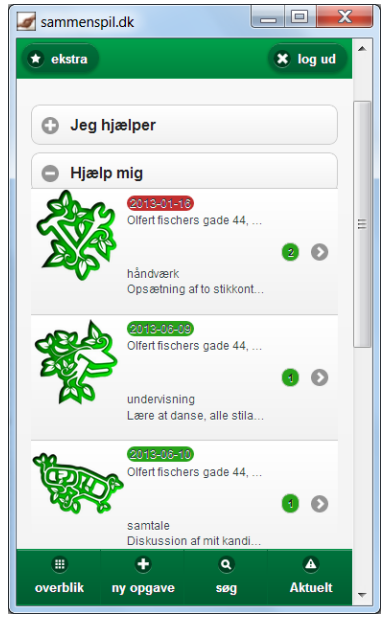

Figure 8.24: Receiving help

See figure 8.23. The user can see when the tasks takes place by looking at the date. The color of the date shows if the task time is close. The color can either be red, yellow or green depending on the time left until the task must be executed. The other colored circle with an x shows if the users help has been accepted. If the circle is red with an "x". The users help has not been accepted. If the circle is green with an "v". the users help has been accepted.

The "hjælp mig" section allows the user to get a lot of important info about the tasks the user is getting help with. See figure 8.24. The user can see the date for when the task is taking place. The color can either be red,yellow or green depending on the amount of time left before the task is taking place. The other colored circle with a number shows the number of people who has offered to help. The circle is red when nobody has offered help and green when help has been offered.

8.11 Learn How to Use the App

Most pages in the app has a info icon located at the top off the page. This allows the app to offer the user a helping hand when needed. The user can simply click the info icon to get help. A pop up window will open. This window contains text and video that explains how to use the specific page. This means that anyone can learn to use the app. Figure 8.25 shows how the pop up windows looks.

Figure 8.25: Info pop up window

8.12 Commenting on a Profile or a Task

The app allows the user to comment on profiles and tasks. This allows the users to share their experiences whether they are good or bad. It also allows the user to ask a question about a task or to come with a suggestion.

When a user wants to comment a task he must expand the section called "kommentarer" See figure 8.26. The user can then click "tilføj kommentar" this will take the user to a new page where a comment can be entered and saved. When the comment has been saved the user is transferred back to the task where the new comment is visible.

The comment function works in a similar way for profiles and for tasks.

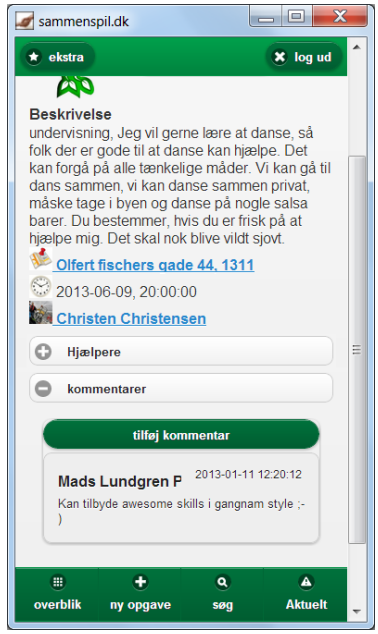

Figure 8.26: User can comment on a task

8.13 Extra View

This page contains all the functions used less frequently. Figure 8.27 shows the page. The page links to the following functions: "view profile", "feedback", "user statistics", "app info", "contact sammenspil.dk", "terms of service and privacy policy". The user can access the page by clicking the "Extra" button in the top left corner of the app.

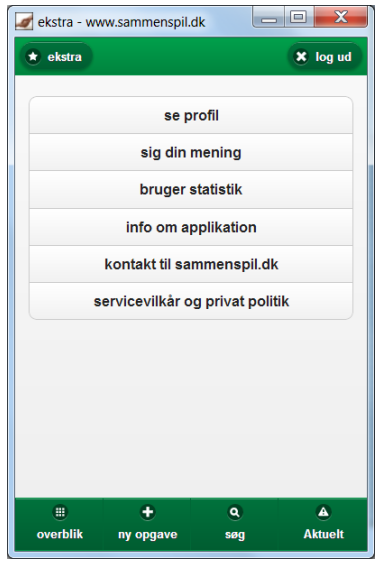

Figure 8.27: Extra page view

Chapter 9

Future Work

This project has created a foundation for creating a mobile web application for managing and sharing volunteer work. The project has includes an implemented prototype app. In the future a full app with all the proposed features should be developed.

Design
The basic UI design of the prototype app is very good, but it can be improved to make the app even easier to use. This will be necessary when more features are added to the app. Improving the design will consist of finding solution to make the design intuitive and simple while more features are added. The design works acceptable on all devices but more emphasize must be put on creating a better user experience when the app is used on a computer. The design should still be developed with Jquery mobile since it has proven to be a powerful free platform.

User Actions
All the features and attributes that the app should have and which are described in chapter 7 should be implemented into the actual app. This includes the following essential features.

- Features to manage projects and organization. Which allow for organization to use the app.
- Template features which allow the user to create content like tasks with ease.
- Features which learns about the user and what the user likes. This will allow the app to customize the experience for the single user.
- Gamification features that rewards and motivates the user. Like a point system and a diploma.
- Features that lets the users create more custom content like uploading pictures, sound or video.
- Feature that lets user create a "help point". Where a helper can offer his service to beneficiaries.
- The process of creating a user profile should be improved with the suggestions mentioned in section 7.4.
- The search function should be improved to allow for even more advanced search features and to improve the existing features.

Software Tools
New and additional tools are necessary to continue the app development. It is already possible to find newer versions of MySQL and Jquery mobile which brings new features. It is also possible to find frameworks for PHP and context management. These Frameworks are not suited for rapid prototype development but they are very useful for managing and expanding a professional app.

Messaging System
Improved email features should be implementd. These features should provide: Prettier emails, additional types of emails and the ability to send to all email services. In general the application should improve the users messaging experience. Part of the work is a simple matter of using more time for developing additional features. Another part of the work is to be able to send emails to all email services especially Hotmail. This is more complicated. It is either a matter of using existing costly services or to develop a a good reputation at the specific email company so the mails are not blocked.

Maintainable Software
The application code should be updated to ensure that the code is easy to maintain and easy to expand. This is important since the source code size will grow a lot until the app is fully implemented.

Application Data
Application data handling and security should be improved. The app should protect the user data in accordance with the market standards. It will be necessary to investigate the market standards. The app should also sanitize and Validate the data that the user enter into the app. The app server side needs a whole new array of server side function to manage the database. This will become important as the user numbers grow to be able manage the user data.

Facebook
The app has to be integrated even more with Facebook. This allows for more options to promote and improve the app. Ass mentioned earlier the apps Facebook stories (impressions) must be improved to attract more users. It might also be possible to import and export event to and from Facebook.

Privacy
The user privacy should be improved allowing for the user to customize how much user data is shared with other people. This also includes a new login for the app which allows people to use the app without Facebook.

Testing the Application
The proposed technical solution for a mobile web app has been tested to some degree but it still needs to be tested additionally. In the future the solution should be tested in regards to scalability to ensure that the solution will work with many users. The solution should also be tested in relation to availability and reliability. Is the system able to be online around the clock? Is the partner services used able to be online around the clock?

A Team
The created app prototype is great to showcase and test the project idea. The material and ideas generated in the project will allow for a future app version which will be very powerful and useful. In order for this to happen it is important to acquire a strong team who wishes to implement, manage, promote and support the project.

Chapter 10

Conclusion

This chapter discusses the results obtained in the project.

10.1 Completed Project Actions

The following actions has been completed during the project.

- Relevant literature has been examined to aid in designing the app with desirable features and attributes. The thesis documents the findings.
- Relevant and similar project has been reviewed in order to acquire a list of useful and desirable features to use in the design of the proposed app. The finding are documented in the thesis.
- A design has been proposed. It includes a description of the actions a user should be able to perform. It also includes desirable technologies to use for implementation.
- A prototype app has been built. It includes a client and a server side.
- The implementation of the prototype has been documented.
- The app has been tested by 45 users. Acquired from friends, Facebook and the internet.
- Info about the app usage have been gathered from the 45 user's trough: Facebook insight and the app database.

- The useful parts of the data has been analyzed and relevant trends has been observed and described.

10.2 Project Goals

The following section presents the status of reaching the initial goals that was presented in section 1.2.

Status of Goals

- Pairing people:
  The project has identified a long list of useful features for the proposed app by reviewing similar projects and relevant articles. This enables an app design and an app prototype which is optimized for aiding people in helping each other and pairing people to do so.

- Accessible on many platforms:
  The app is working on most devices, platforms and with most browser. The app has been developed and tested for this purpose. The app even works on older smartphones and browsers. The app has been tested on several year old phones. Like the iPhone 3GS and the Android Desire and very old browsers Like Firefox 5.0. This allows for an app which is available to most people.

- Integrated with Facebook:
  The app prototype is integrated with Facebook which allows for the user to share content to Facebook in several ways. The app can easily be expanded into offering the user even more Facebook related sharing options. The Facebook Insight statistics show that a single Facebook share can push a message to several hundred people.

- Agile system:
  The app prototype offers a location and time based service which can aid in parring people who needs help and people who want help. The app is available to smartphones so it can be used everywhere. The proposed user actions creates a system where people can help and receive help in several ways.

- Autonomous system:
  The thesis proposes an autonomous system and documents the features

necessary for such a system. Like build in security features, reward features, help features, feedback features, task management features. The prototype app has implemented some of these features. The users can comment on content, share tasks, give feedback and receive news.

- Easy to use for all:
  The design decisions which has been taken should make the app easy to use for people with little technical experience. The app has a built in help function. The app has been designed with a simple user interface that is easy to navigate.

- Minimizes user's effort:
  The app prototype is designed to ease the tasks of performing a search or creating a task. The user can do a predefined search by a single click. The user can get an overview of all the tasks which the user is committed to by a single click.

- Open to all:
  The app has been designed as a general solution for facilitating volunteer work. The app should be able to support all kind of causes and situations.

10.3 Final Conclusion

The project set out to propose and describe a new method of engaging people in volunteering work. This new method should be an improvement or supplement to existing methods. The idea was created on an idealistic basic so it was not given that it would be a sensible idea. The project has proven that the idea is valid.

A lot of similar but different projects exists in the world and in Denmark. These projects are aimed at different purposes. The fact that all these projects exists indicates that it is a valid idea. This report suggest how to gather the strengths of these projects into a single mobile web app. This app will when be able to serve the Danish population. There is no guaranty that this app will be a success but the fact that this project has been able to gather so many ideas from existing project means that the app is likely to succeed.

Today powerful and useful smartphones are being used by more and more people in the Danish society. This is indicated by the statistics referred in this report. Technologies that allow developers to serve smartphones as well as other platforms with a single app is also available. These facts make it more likely than ever that the idea behind this project could succeed. The project has shown that the technical solutions to serve the majority of the population through a mobile web app is available. The web app created shows that a mobile web app is also able to offer the features needed to create a location based task management system to distribute micro volunteering work.

The biggest challenge in creating a successful app is to make it spread virally. The prototype created in this project was integrated with Facebook in hope of making it viral. The prototype spread slowly and didn't become a viral success. This shows that the biggest challenge remaining is to create a strong foundation and team around the app to be able to gather enough resources to make the app spread virally.

The project has proposed and motivated the idea of promoting volunteering work in a new way. The project has also examined, created and tested technical implementation of the idea. The project has completed the goals and actions which it set out to complete.

Appendix A

Source Code

No actual source code for the prototype is available in this appendix since the code is several thousand lines long. The source code for the implementation of the prototype can be found on the CD attached to the report or at www.sammenspil.dk/mobile/sourcecode.zip.
The files are compressed to a archive of type ZIP. The archive contains the same files as the web site server. The archive file contains the source code for this project but also the libraries included written by other people. The source code have been altered in one way it doesn't contain any sensitive information like IDs or passwords.
In case a reader of this report wishes to acquire the source code but is unable to access it from the homepage or from a cd. The person can contact the author.

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Tlf. nr.: 61359629

Appendix B

Source Data

This chapter contains source data relevant to the Thesis.

Figure B.1 contains the source data which have been used for graph 7.1 , 7.2 and 7.3 in section 7.4.

Facebook info	
emne	**amount**
users	45
real name	44
not fb email	45
education	1
description	2

Search preferences	
type	**amount**
undervisning	5
transport	4
samtale	5
it	4
håndværk	7
andet	5

User info	
emne	**antal**
users	45
adress	13
zip code	13
description	26
education	15
email	16
telephone	15

Figure B.1: Source data for figures

The following three pages show the source data from the statistic table in app database. The data was used to generate table 7.4 in section 7.4.

statestik print

user_id	nr_logi	nr_oprettede_opg	nr_søgning	nr_besøgte_sa	nr_besøgte_pro	nr_besøgside_ak	nr_besøg_opret
62	4	3	15	18	11	7	2
123	3	5	17	5	2	3	6
77	2	1	10	7	4	7	1
132	3	8	5	4	2	5	5
93	1	1	8	10	4	2	1
117	1	1	7	7	1	5	1
82	1	1	3	0	3	2	1
115	1	2	5	1	1	3	2
129	1	1	7	7	1	2	1
89	0	3	4	1	2	2	2
78	0	0	3	3	1	3	0
84	1	1	7	0	0	3	1
118	1	2	0	0	1	2	2
127	1	1	1	3	1	3	1
65	0	1	1	1	2	1	1
114	0	0	0	0	4	0	0
88	0	0	7	0	1	0	0
124	1	0	1	1	0	2	0
76	0	0	3	0	1	1	0
85	0	0	0	0	1	4	0
86	0	0	2	0	2	1	0
90	0	0	1	2	1	1	0
116	0	1	0	0	1	1	1
80	0	0	1	1	1	1	0
92	0	1	0	0	1	1	1
122	1	0	0	0	1	1	0
128	0	0	0	0	1	0	0
119	0	1	0	0	0	1	1
126	0	0	1	0	1	1	0
81	1	0	0	0	0	1	0
91	0	0	2	0	0	1	0
99	0	0	0	0	1	1	0
83	0	0	0	0	1	0	0
120	1	0	0	0	0	1	0
121	0	0	0	0	2	0	0
125	0	0	0	0	0	1	0
87	0	0	0	0	0	0	0
95	0	0	0	0	0	1	0
98	0	0	0	0	0	1	0
94	0	0	0	0	0	0	0
96	0	0	0	0	0	0	0
130	0	0	0	0	0	0	0
total	24	34	111	71	56	72	30

statestik print

user_id	nr_besøsideg_ove	nr_besøgside_ek	nr_besøgside_lc	nr_klikpå_infok	nr_giv_hjælptil	nr_fjern_hjælptil
62	2	9	0	2	1	0
123	5	2	0	2	0	0
77	2	8	1	1	0	0
132	4	2	2	1	1	0
93	5	5	0	0	0	0
117	6	0	0	0	1	0
82	6	8	0	4	0	0
115	5	8	0	0	0	0
129	1	0	0	0	0	0
89	2	2	0	0	0	0
78	0	1	1	1	1	0
84	1	0	0	1	0	0
118	2	3	1	0	0	0
127	1	1	0	0	0	0
65	1	1	1	0	0	0
114	0	3	0	2	0	0
88	0	1	0	0	0	0
124	2	1	1	0	0	0
76	1	0	1	0	0	0
85	2	0	0	0	0	0
86	1	0	1	0	0	0
90	1	0	0	0	0	0
116	1	1	0	0	0	0
80	0	1	0	0	0	0
92	1	0	0	0	0	0
122	0	2	1	0	0	0
128	0	3	1	1	0	0
119	1	0	1	0	0	0
126	1	0	0	0	0	0
81	1	0	1	0	0	0
91	1	0	0	0	0	0
99	1	1	0	0	0	0
83	0	1	1	0	0	0
120	1	0	0	0	0	0
121	0	0	0	0	0	0
125	1	0	0	0	0	0
87	0	0	1	0	0	0
95	0	0	0	0	0	0
98	0	0	0	0	0	0
94	0	0	0	0	0	0
96	0	0	0	0	0	0
130	0	0	0	0	0	0
	59	64	15	15	4	0

statestik print

user_id	nr_accepter_hjælp_tilb	nr_afslå_hjælp_tilbu	nr_deltil_faceb	nr_rediger_pr	nr_rediger_s	total
62	0	0	2	2	0	202
123	0	0	0	1	4	301
77	0	0	0	0	0	198
132	0	0	0	1	0	307
93	0	0	0	0	0	223
117	0	0	0	1	0	265
82	0	0	0	0	0	193
115	0	0	0	1	0	259
129	0	0	0	1	0	280
89	0	0	0	2	0	198
78	0	0	0	1	0	171
84	0	0	0	0	0	183
118	0	0	0	0	0	250
127	0	0	0	0	0	267
65	0	0	0	1	0	141
114	0	0	0	2	0	239
88	0	0	0	0	0	185
124	0	0	0	0	0	257
76	0	0	0	1	0	160
85	0	0	0	1	0	178
86	0	0	0	1	0	180
90	0	0	0	1	0	187
116	0	0	0	1	0	239
80	0	0	0	1	0	166
92	0	0	0	1	0	190
122	0	0	0	0	0	250
128	0	0	0	0	0	262
119	0	0	0	0	0	243
126	0	0	0	1	0	257
81	0	0	0	0	0	166
91	0	0	0	0	0	186
99	0	0	0	0	0	202
83	0	0	0	0	0	169
120	0	0	0	0	0	243
121	0	0	0	1	0	245
125	0	0	0	0	0	252
87	0	0	0	0	0	175
95	0	0	0	0	0	191
98	0	0	0	0	0	197
94	0	0	0	0	0	188
96	0	0	0	0	0	192
130	0	0	0	0	0	260
	0	0	2	22	4	9097

Image Sources

This section contains the source URL for the figures in this report which originates from the internet. The figures are ordered by when they appear in the report.

Figure 2.2 originates from:
http://www.3.dk/Privat/mobil/Daekning/

Figure 3.1 originates from:
http://www.frogloop.com/care2blog/2010/
6/15/three-apps-and-networks-spurring-social-good.html

Figure 3.2 originates from:
http://www.natashajudd.com/do-some-good-iphone-application-review/

Figure 3.5 originates from:
http://apps.usatoday.com/#iphone/niceserve-app/id/371004345

Figure 3.6 originates from:
https://play.google.com/store/apps/details?id=dk.projektfrivillig.
android&hl=da

Figure 3.7 originates from:
https://play.google.com/store/apps/details?id=dk.projektfrivillig.
android&hl=da

Figure 3.8 originates from:
https://play.google.com/store/apps/details?id=dk.projektfrivillig.
android&hl=da

Figure 3.11 originates from:
http://androidapp.lisisoft.com/apps-android-phone/248715-com.saasilia.
geoopmobee.html

Figure 3.12 originates from:
http://androidapp.lisisoft.com/apps-android-phone/248715-com.saasilia.geoopmobee.html

The images used for Figure 4.1 originates from several sources:
http://internet-browser-review.toptenreviews.com/

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Figure 4.2 originates from:
http://foursquare.softonic.it/android

Figure 4.3 originates from:
http://developer.apple.com/library/ios/documentation/userexperience/conceptual/mobilehig/UIElementGuidelines/UIElementGuidelines.html#//apple_ref/doc/uid/TP40006556-CH13-SW1

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