



HandleNett

by the group consisting of:

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1. Introduction

1.1 Idea

Imagine being able to shop for your groceries whenever and wherever, by setting a time and place, and simply picking it up when it's convenient for you. This was the idea our group wanted to focus and experiment on, essentially an app that makes it possible for shop workers to gather the user's groceries based on a defined shopping list made by the user, and then have the user come get it.

1.2 Motive

The motivation to design and develop app like this is to make grocery shopping a more effective process. A lot of customers tend to spend too much time in the grocery store, either bringing along a shopping list with them to remind them what they need to buy or wandering around to find whatever it is that they need. With the app the customers will just drop by the store and pick up whatever they ordered in the app, which saves them a lot of time. The customers may order their groceries while at home and look around what they need to order, so they won't need to ever remember what to buy. It would also appear to be economically beneficial for the customers, since they aren't spending that precious time in the store and getting trapped in advertisements.

This app would also make grocery shopping accessible for people with certain disabilities. Considering that smartphones have a wide range of support for people with sight-related problems. The app would be made in a way that it would support voice over and give both visually impaired people and elderly more independence when it comes to grocery shopping.

With apps that enable users to shop online and have their food delivered to their home, it's not a stretch to imagine a future where people won't want to "waste time" going down to the grocery store, so having an app that encourages them to use their local facilities seems like a good idea.

One last aspect that seemed beneficial was that the amount of food that is brought to stores and then thrown out. Mass production means a lot wasted energy and resources which obviously affects the environment. Having statistics from the app when it comes to what users buy and how often, and how much, would give valuable information to each local store for them to know what to order, when, and how much. This would eventually be a long term project as it takes time to gather data like that, but it is still an interesting aspect connected to our project.

1.3 Research Questions

An app like this has a lot of issues and research questions that need to be considered and well researched. First of all we need to find out user group and while this app is meant to be used by all types of people, we wanted a challenge and decided to focus on the elderly. Making an app with them in mind means that other users would also be able to use it. But *with* that comes a lot of consequences, as very few of us have worked with elderly people in our previous projects and so on. It is even hard to say if they would use our product, as older generations are often very keen on social interaction, and maybe it is a positive experience for them to roam around the grocery store or local mall as they shop.

Another question is what functionalities are best to have in an app like this. Intertwined with that question is obviously what kind of platform we want to use, and more about this will be discussed in the theory section of the report. With a user group of elderly people we need to make sure the app is easy to use, and also have consideration for the different problems they might face when it comes to *using* apps on their phones. Added to this the app will have an option to log in as a worker in a store, and they will also need simple functionalities to choose a shopping list they will fill up.

Concrete research questions will be presented and acted upon during the “Research” part of the Development Process point. Lastly it’s important to mention that safety, security and reliability are all factors that needs to be ensured when developing this application, as the app will contain personal information about the user, and have the user’s location shared.

2. Theory

2.1 Governance of flexible mobile service platforms ^[1]

Mobile applications are developed on and used on different types of platforms, and this article discusses how the different aspects of mobile development requires flexibility from said platforms. Based on how flexible you want to make an application, one has to consider three actors; the platform provider, the service provider, and the end user. Finding a platform with flexibility that perfectly satisfies the service provider AND the end user is shown to be difficult at the time the article was written.

The article gives a good description of what one might consider to be a platform; *“A platform may refer to a hardware configuration, an operating system, a software framework or any other common entity on which a number of associated components or services run” - P. Ballon(2009)*

Without going into too much detail, a flexible platform means giving specific accessibility to both the user and the service provider without devaluing the platform business wise. The way this article is relevant to HandleNett is based on the fact that we want to make it globally accessible without too much cost. As we have decided to develop HandleNett like a web-app, it will enable users to use the app no matter what OS their phone runs. This would mean we are using a service provider centric platform, and while this allows for great flexibility, an issue that will be discussed during our presentation would be the safety of this type of platform.

2.2 Expanding the 'Mobility' Concept^[2]

The article focus on mobility and how our daily lives and lifestyle have changed. Future it is mentioned large part of facilities and tools at home, and office will be reduced enough in size to carried around geographically. When it comes to our app it will geographically help our user by order grocery food through app while they are at work and pick it up later on the day for example. Maybe this will encourage some users to multitask better, and on the other hand give users who have a hard time a way to plan

their lifestyle in a more independent way. There are three types of mobility; spatial, temporal and contextual mobility.

Spatial mobility defines that Information Communication Technology have made our life much easier by making us possible to connect with each other no matter where we are situated. Mobile communication technologies such as mobile phones and etc. has energized human nomadicity in urban life. By using our app we are making customer to contact the store technologically to make the products that they want ready to pick up.

Temporal mobility influences our society and activities where by using technology we are saving time. By using our app we are saving time for people, instead of going to stores and using time to find a product, they can easily select or search for the product and put it in a shopping list. It not only saves time for the client, but it also makes it easier for client to buy the products they want. There are 2 types of users *monochronicity* and *polychronicity*. What the article means by monochronicity is a person who doesn't plan their daily life and just do as they want. Polychronicity means a person who plans their day or weeks on beforehand.

Contextual mobility makes it possible to organize and manage our work activities with fewer constraints. It makes it flexible, and we are not anymore depended of geographical and temporal constraints. By using our app you can order your groceries from work, from home, from anywhere. It makes people so much more independent, and people will not anymore care where they are situated.

2.3 Misc.

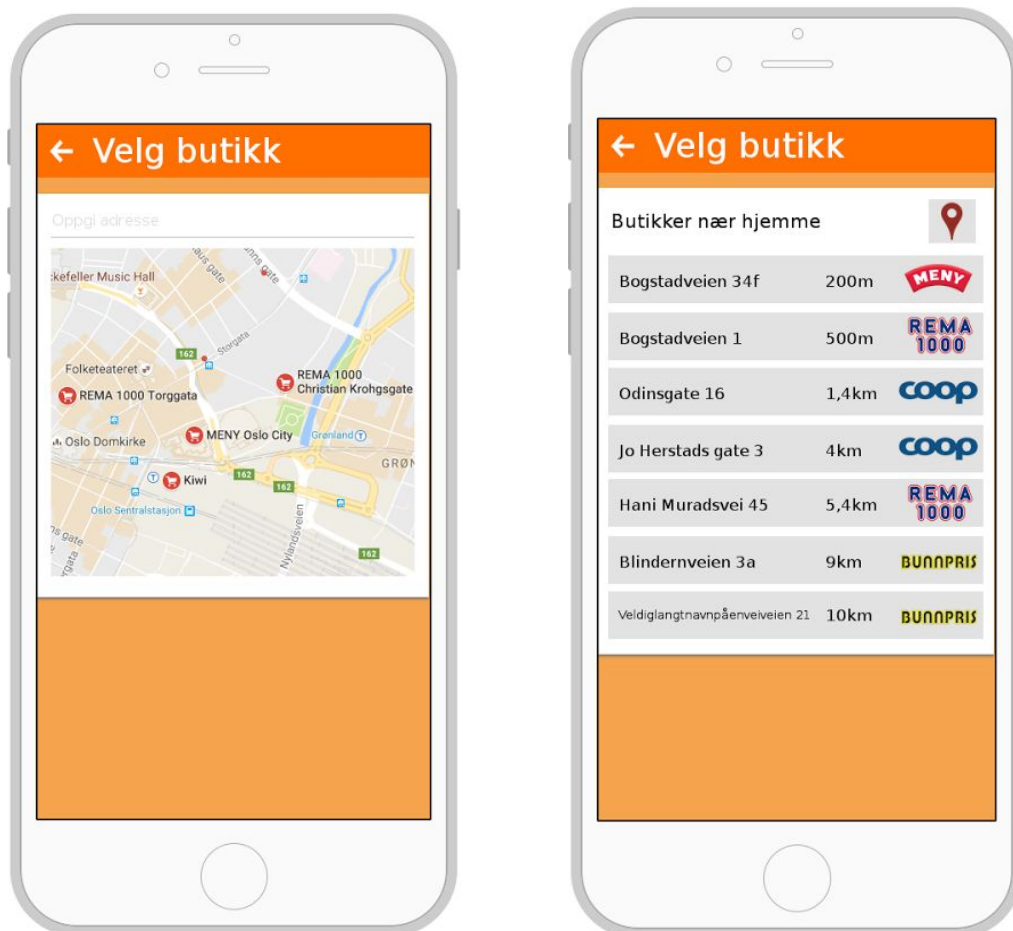
When developing the apps such as handlenett it is important to be aware of simplicity, visibility, accountability, awareness and feedback. Like it says in the article Governance of flexible mobile service platforms "*Mobile services should not only replicate the fixed Internet but may capitalize on novel value drivers like context awareness, personalization and mobility.*" (Kilde futures artikkelen)

Simplicity

It is important to have simple design of our app. Our main user group is elderly people. And that is why we need to make the common task in the app easy. For us it is

important that communicate in users own language. It should provide good shortcuts between tasks.

There are several structure decisions with the app that we need to consider when building the general layout, but also when designing specific functions like making shopping lists and choosing which store to order from.



Two mockups of the feature that selects which grocery store the consumer is going to pick up the groceries at. The image to the left is a map based selector and the right image is a list based selector.

When considering the design for how to choose a grocery store we looked at a map based selector and a list based selector, both with their pros and cons. The benefit of the list based prototype is exactly it's simplicity when comparing it to the map based prototype. While the map prototype can be highly accurate it could appear too complex for an elderly user who doesn't spend too much time navigating map apps like Google

Maps. The downside of the list based selector is that it's lacking accuracy since it only lists grocery shops nearby of home. Therefore we can argue that we want to keep both ways of choosing grocery store by having one of them as a default selector which may link to the other. As we can see on the prototype to the right above, we added a map icon which links to the more complex selector.

This is just one example of the challenges we face when designing such an app. An even more difficult question is how we are going to structure the function that creates a shopping list which is the feature that the user is likely to spend most of their time on. Therefore is it important to minimize that time by designing the feature in such a way so that the app won't be a struggle to learn by the user.

Visibility

We assume that older people might have difficulty with complex apps. That is why it is important to make all needed options and materials in a task visible. That means tasks should be visible for users without distracting them with extraneous or redundant information. That is why good design in this app is necessary to not overwhelm user with alternatives or confuse with unneeded information. Our goal in this app is to make it easier for users to find what they are looking for most easy way they can.

Accountability

It is important users understand their actions in the app. When we make the app accountable we make it obvious for users of their actions and lack of their actions. By that we mean because the users understand their actions in the app they are also being responsible for their actions.

Awareness

We define awareness as the user's location in the application. This is very important when it comes to elderly people, because if they are using more time to navigate in the app, it is important to give them clue where they find themselves in the app. They might lose their thread of thought if to many steps are taken.

Feedback

Feedback is one of the most important aspects in this project. Our app should keep users informed of actions or interpretations. That means for example if the user forgot to pay for the product list they submitted, they should get a notification from the app to pay for the grocery list before they can go pick it up from nearest store. It is also important to make the user be notified if there is an error etc. The user also should get notification to the reason for the error that occurred. Feedback shouldn't be complicated either. Because our main user group is elderly people, feedback should be very simple, and the solution for the error should also be proposed.

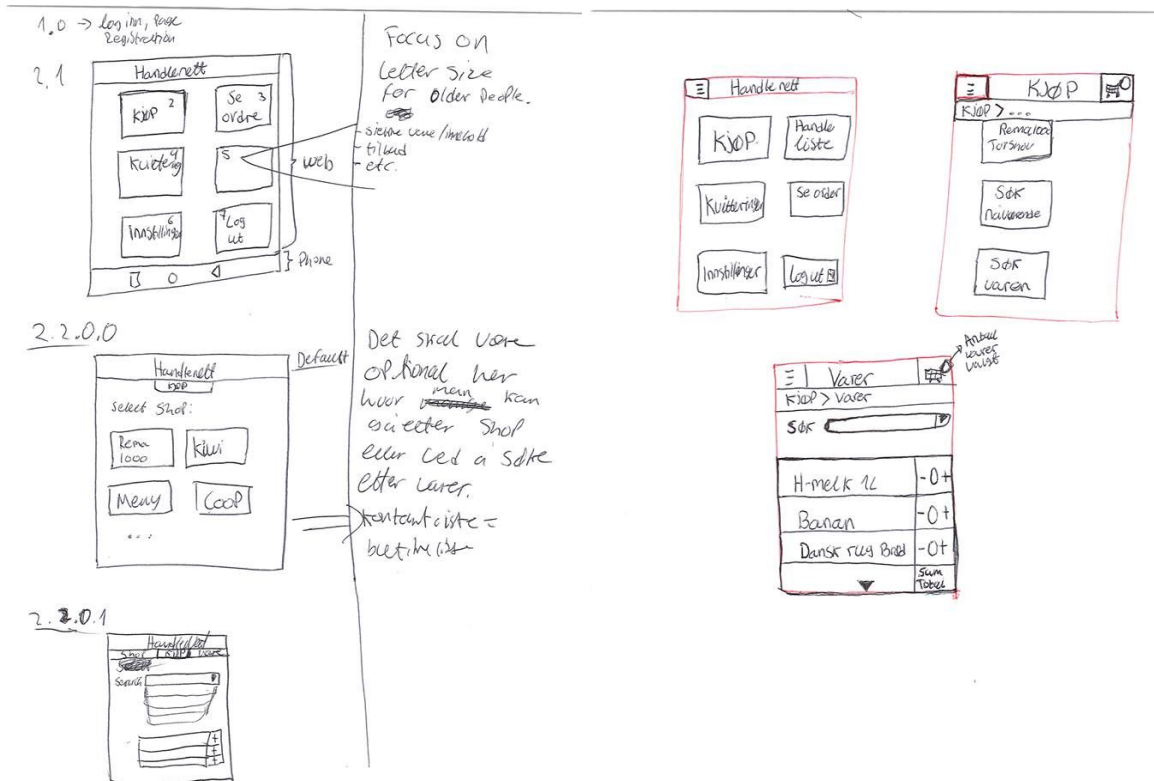
3. Development process

3.1 Research

The purpose of the survey is to get overview over usergroups with the help of statistics. We need to know that this application covers the users needs. The survey questions will give us answers about user needs and feedback about our survey question and app idea. With the help of a survey, we will be given an idea about what potential users think about the concept of HandleNett. As we mentioned earlier our focus is on elder users and whether they would be interested in using such an app. The survey will obviously be anonymously done so that the users can feel more comfortable giving their honest opinions.

We will also be using observation as a research method, maybe visiting a shopping mall and observing how our user group shops in general, and simply be a fly on the wall. Eventually we will also ask if any of the shop-goers are interested in an interview, as getting qualitative data is equally important for us in order to get to know our user group better.

For the design we made a few sketches and talked about how to best design the layout of the app, and what colours to use and how to best make the app as intuitive as possible. This will be further investigated as we have more time. Low fidelity prototyping was used to sketch out ideas and brainstorm.



A couple of the sketches made for prototyping the user interface.

3.2 Data gathering

We plan on getting an overview about the relevance of the app we want to make. We decided the fastest and easiest way to do this was to make a survey, as that enables us to gather a lot of general data from a large group with varied experiences. With both closed and open questions we hope to get information on whether there is relevance for this app, and eventually what we can change to make our development process better. One big challenge for this process will be finding people over a certain age to take the survey. We might have to do a more specific data gathering in relation to gathering information from a user group with age 60+, for example doing short but valuable interviews. In order to do this we will have to go to areas like shopping centers or communities or elderly homes to see if they would have use for an app that would make the shopping experience easier for them.

Using a survey means we will most likely be doing statistical analysis of the data we get. The open questions will help us get an honest idea of what people *think* without the angle of “making an effective app for grocery shopping.”

3.3 Technology

Google's Material Design is a user interface framework, that has its own guidelines for how to design user interactions and accounts for Universal Design (UD). Since UD is mandatory in Norway for any application developed for the public, this comes in handy. Material Design is also an overall easy to handle framework that is compatible with ReactJS which is also a framework we want to utilize. AngularJS is another popular framework we may consider since AngularJS version 2 recently released in 24. September 2016^[3] and is therefore past the weird transition of version 2 not being backwards compatible.

For high-fidelity mockup sketching, we decided to utilize *Proto.io* because we found it easy to use and it also supported Material Design user interface elements. This made it possible for us to mock prototypes that could be as close to the real app as possible in a fast and easy way. *Proto.io* also has animation features which allows us to animate the app with different transitions and button triggers. This means that we could almost make the whole app in *Proto.io* being as close as a prototype can be to the real thing. Although animating pages and different transitions in the app is overall a good feature to have in a prototype, we decided not to utilize this feature in our project. This is due to the project's time frame and that we don't want to focus too much on the prototypes.

Google Forms was used to create a survey for gathering user data and gauging interest. Google Forms is free and easy to use, and makes it possible to plot the results into an excel document if that is needed^[4].

Facebook was used, where we shared our survey on both private profiles and a grocery page. Many older people know how to use facebook for communicate with family and

friends, though there's not a 100 percent guarantee that all older people are active on social media.

4. Results/Findings

Our survey gave us good base data, and because it was posted in an environment with all age groups, the majority of participants were between the ages 19-30. We have yet to gather data *specifically* from our main user group, but through the survey we also got feedback from people in the age group 50+. The most interesting points were:

- What platforms the participants use, as this backs up our wish to make a web-app to support both Apple and Android phones (and other).
- How much time people spend in the store, to see if the process could be made more effective
- The responses to our open question "Would you use this app to shop for groceries?". Here we got insight, as people in different situation commented based on their own experiences.

With that last point we noticed a very important point: Some people enjoy the experience of going to the store and taking their time, interacting with the store workers, and this exact point might be a small hindrance as older people might enjoy this aspect even more.

It is critical for us to get in contact with our user group as soon as possible so we can properly develop our idea even further.

Snippets of graph results from our survey has been added at the end of the document.

5. Future plans for the project

For the future we plan to go fill the biggest gaps, filling in the different sections and trying to use the view of our user group to push the project into an even more specific road. Finishing the high fidelity prototype and making cases, hopefully getting some good interviews with different people of different age in the age group we have decided to focus on, and maybe experiment a little more with improving the design.

We look forward to receiving feedback on whether or not we are on the right track.

6. Resources

[1] de Reuver, M., H. Bouwman, G. Prieto, and A. Visser. "Governance of Flexible Mobile Service Platforms." *Futures* 43, no. 9 (2011): 979–85.

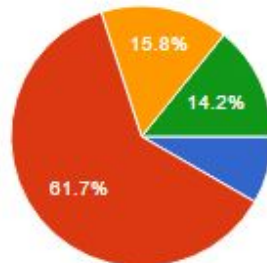
[2] Masao Kakihara & Carsten Sorensen: *Expanding the 'Mobility' Concept*, 2001. SIGGROUP Bulletin December 2001 No. 22, No.3.

[3] <https://en.wikipedia.org/wiki/AngularJS>

[4] The survey made for gathering user data
https://docs.google.com/forms/d/e/1FAIpQLSc_KOa8g1HAzoo01I-1Y4452kNNA5z4mmY276uqfKVzbpw6w/viewform?c=0&w=1

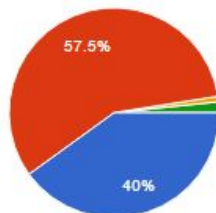
Graphs

Alder



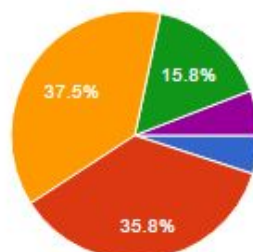
13 - 18 år	10	8.3%
19 - 30 år	74	61.7%
31 - 49 år	19	15.8%
50+	17	14.2%

Hvilken mobiltelefon bruker du til daglig?



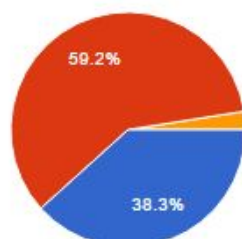
Android (Samsung, Sony, Huawei, LG...)	48	40%
Apple (iPhone)	69	57.5%
Windows (HTC, Nokia)	1	0.8%
Other	2	1.7%

Hvor lang tid bruker du hver gang?



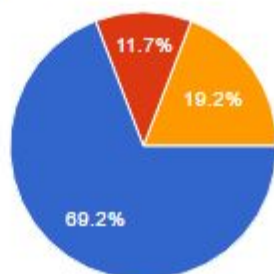
2 - 5 min	6	5%
5 - 10 min	43	35.8%
10 - 15 min	45	37.5%
15 - 30 min	19	15.8%
Mer enn 30 minutter	7	5.8%

Hvor ofte handler du i butikken?



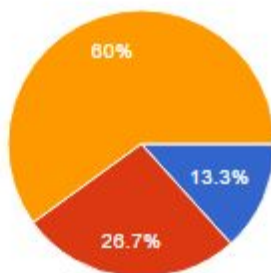
Mindre enn 2 ganger i uka	46	38.3%
Mellom 3 til 7 ganger i uka	71	59.2%
Mer enn 7 ganger i uka	3	2.5%

Hadde du hjulpet til med å hente varene til en eldre person?



Ja	83	69.2%
Nei	14	11.7%
Kanskje	23	19.2%

Hadde du brukt "HandleNett" applikasjonen vår for å handle?



Ja	16	13.3%
Nei	32	26.7%
Kanskje	72	60%