Enhance the user experience with a second screen

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April 5, 2016
Master’s Thesis in Interaction Technology and Design, 30 credits
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Abstract

The goal for this thesis is to create an second screen application that will enhance the experience while watching a first screen. In order to create that type of application research within the subject and reviews of existing application is conducted. The reviews resulted in functionality and content that a second screen application should have. One of the big challenges for working with a second screen balance the focus between the screens and to make sure that the application creates value, rather than taking time and being frustrating.

A concept of an application based on findings and iterations that will enhance the experience were created. The concept were realised in wireframes and design mockups. The main functionality for the application is implemented with the native language objective-c as a working prototype on iPad.

The biggest finding during this thesis is to remember to focus on solving one specific problem for the user.
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Chapter 1

Introduction

Television is a big component of today’s modern society, in the United States, television is the dominant media activity and is also considered the most exciting and influential media type[24, 6, 33, 27]. With the advent of video-on-demand services the way people consume media is under a fundamental change[24]. Nowadays people are less likely to watch shows together at the same time or place and television viewing that has been a social activity are being reduced to a passive and isolated experience[24]. With the technique there is today in 2013, users watch television on screens that vary a lot in sizes. On a small mobile screens users often watch alone and on a bigger screen they watch together. The benefit of watching media on a mobile device is that the user can choose to see shows anytime and anywhere they want. When people watch shows at one place they may want to continue to watch somewhere else and make the content follow them, mobile devices makes that possible[4]. To give the user the best experience the process of moving the content between devices should be as seamless and dynamic as possible[4]. As stated, television is big and growing but the question is; how can it develop into something more, what can be done to give the viewers a better experience?

Despite the increasing competition of streaming shows from the internet, television usage has increased 50% since the 1950s to 2008 and 12% increase from 1996[24]. Research has showed that the average person watches 4.5 hours of television a day[24, 6]. Television as a virtual social experience started to evolve with the advent of the hashtag[4] in 2007. The social networks are frequently used everywhere, but can the social aspect be integrated and give a value for the user that are higher than the social network integration that are available today? Or is it another aspect that should be developed to enhance an experience using a second device while watching television/series?

The experience watching television can be enriched by using other devices than the traditional television and remote control[4], a second screen can be added. A second screen device can act with both rendering and interaction capabilities[4]. For example; multimedia content can be split across different
devices, each one rendering different parts, one can show a presentation while the other device can be used for controlling the content of the presentation[4]. Having an device act as a second screen can provide extra information about the current media shown on the television and allow the user to browse recorded content for later playback, without disturbing the television experience[5].

The second screen can also be used even if the content of the second screen does not have any connection to what is on the television. Research reports that viewers frequently use their laptop to surf the web, check their email or shop online while watching television[5, 36] and tend to focus on the second device instead of the first.
Chapter 2

Problem description

This paper is focusing on second screen, not just for television, but also how viewers can use the veracity of digital devices to enrich an experience either alone or together with others[5]. Adding an application related to the media on the other screen and hope that users will automatically use the application the right way to enhance the experience may not be enough. Thinking about what is it that the users wants and when can a second screen be added without taking all the attention from the first screen?

We know that a second screen gives an anytime, anywhere availability[15], how can we use that knowledge to create something new that enhances the interaction and information experience for users[19], and make the two screens work together as one.

2.1 Problem Statement

The subject of second screen came up since the agency gets a lot of requests from customers that want to add another dimension to their application and it is quite a new way to develop applications. Being an agency that creates and produces innovative digital products it is important to follow the digital trends and take them further to create something even better. The goal is to see what has been done before in this topic, what can be learnt from them and if a second screen can enhance experiences in a way that have not been done before.

To make a detailed research as possible an in-depth study will be conducted in the subject. The research will include what to think about when designing for two screens, some problems that can come up with an addition of a device. Even though there are a lot of reasons to why a second screen should be added, there are some things that has to be evaluated; at which time do a user want to have a second device, when can the attention be divided and is it really necessary to add an second device?
If a user try a second screen application, how to sustain that user and enhance the experience every time they are using that application? Existing projects in this subject will be evaluated to see how they work in practice not just in theory. After the detailed research and evaluations, ideas will be generated and analysed to create a concept. That concept will be realised in mockups and wireframes. When the concept has been evaluated and discussed it will be made into a prototype.

2.2 Goals

The goal for this project is to develop an application that will enhance an experience and sustain the user to that application. A prototype of this project will be created to exemplify and explain the usage of second screen. The literature review will also include various evaluation methods for mobile applications. Some important aspects will be researched; what to think about when designing for a mobile device and how to create a second screen application that does not take all the attention from another screen.

2.3 Thesis outline

This thesis is organised as follows:

Chapter 1 - introduction The introduction describes the reason for choosing second screen as a subject and how people are using their mobile devices today (2013).

Chapter 2 - Problem description The challenge of working with second screens are stated in this section, as well as the goals for this thesis.

Chapter 3 - Method This thesis is conducted at an agency based in Sweden. Except for learnings from them, research and idea generations together with people working there is described. A review of existing applications and concept realisation is conducted and this section describes how that is done. As well for the prototype creation.

Chapter 4 - Background Second screen is a quite new subject but there are some application available today. This section describes how second screen applications can fit in to the everyday life and how existing applications has been received by users.

Chapter 5 - Second screen applications The research for this subject is described in this section; learnings, advantages and disadvantages.

Chapter 6 - Related work 9 application has been reviewed and summarised
in this section.

**Chapter 7 - Realisation** The idea generation and iteration has been realised as a concept with wireframes and design mockups. A prototype created with the native language objective-c has been conducted. How that was done is described in this section.

**Chapter 8 - Discussion** The road to the concept and prototype was not as straight forward as hoped. Why that is and how it could have been done different are discussed in this section.

**Chapter 9 - Conclusions** A summary of the conclusions, the functionality included in the concept and the workflow for this project is stated in this chapter. As well as the learnings from working with this thesis.

**Chapter 10 - Future work** The solution is not a working application but a concept and a prototype. Moving on with this application there are some work to be done. My thoughts regarding the future work are stated here.

**Chapter 11 - Limitations** Mostly due to timing there were some limitations.

**Chapter 12 - Acknowledgements** During this thesis I hade some help from others, in this section I thank all of them for their contribution.
Chapter 3

Method

This thesis was conducted for 20 weeks at an digital agency based in Stockholm. With a primary focus on mobile platforms the agency creates and produces innovative digital products and will contribute with knowledge and experience of this second screen topic. The goal for this project was to create a concept for a second screen application and a native iOS prototype based on findings and learnings from theory regarding second screen.

To structure the work at an early stage a Gantt-schedule was made. A Gantt-schedule gives a view over all the tasks that has to be performed according to a specific date and a timeline that makes it easier to follow the progress of the work. In this project some breakpoints were added, at these points the project was evaluated and questioned just to make sure that the project was heading in the right direction. The work of this thesis was roughly divided in to three phases, research, idea generation and concept realisation phase. Research phase includes intense data gathering and analyse of existing projects, followed by idea generation together with people working at the digital agency to come up with suggestions and a concept, the final phase concerns the actual concept realisation.

The 20 week plan contained the following steps:

- Setup goals together with agency
- Research regarding second screen
- Idea generation and sketching
- Analyse of existing applications
- Mockup design
- Evaluation and iteration
- Implementation of prototype
Chapter 3. Method

– Writing of thesis

The 20 week plan was follow, looking at the basics. The research phase stretched out over the whole process and since the agency has a lot of clients work with second screen at the moment, those project took some time from the idea generation and sketching of this concept, which will be discussed later. The implementation of the application took more time than expected and included a bit of the concept instead of the whole application.

The design method used for this thesis was Goal-Directed Design (GDD)[8], that method made it possible to secure the quality for the project. GDD provides a work structure with breakpoints and documentation for every phase of the project. Alan Cooper created this method that is centered on the reason people feel motivated and use a product in the first place; user goals. The method is equally centered on expectations, attitudes and aptitudes of users to create products or services that is useful and engaging. Users are likely more satisfied, effective, happy and willing to pay for a product if they achieve their goals when using it. GDD is about understanding the meaning of activities and creating more appropriate and satisfying designs[9] with the user in the center.

To find the structure and functions of the application a flowchart were created. Wireframes of the application were conducted to structure all the functions and sections as a template for the design. Before the phase regarding idea generation, existing applications in the subject of second screen were evaluated. The choice of second screen applications were made depending on how many users the application had at the moment. Evaluation of the applications were done focusing on a few important functions. There where five areas that the applications should include to count as a second screen according to the literature studies:

– Social integration
– Personalised information
– Available at different devices
– Functions of the application
– Easy setup

3.1 Research

First thing to be conducted was the literature study of second screen. The study was important to retrieve information and learn about existing project within the same subject. Analysing existing projects, their problems and what users think about second screen applications creates good knowledge before developing something similar. The research investigates and finds qualitative
information that is used both for explaining the subject second screen and creating a new innovative concept. The research also included literature studies about how a developer should think when creating applications and what to focus on when adding functionality and content into something new.

3.2 Idea generation

To decide how the prototype should work, brainstorming and other creative techniques were used to come up with ideas. To choose which of the ideas to continue working with, the generated ideas that were put into different categories, to see which of them had the same features and if a new idea can come up out of them. The idea phase started in the beginning of the work process and continued over the whole project to make the application as good as possible. Iteration of functionality, content, and experience in each step. After an idea had been evaluated and chosen to continue to develop, the project went on to the next phase; concept realisation where a brief analysis of the possibility to develop an application from that idea and if users would actually use it. One of the important aspects of this evaluation was to see if the idea gives more value than it cost.

3.3 Analyse of existing applications

Whilst creating the mockup design of the generated ideas, existing application where looked at. The idea of evaluating applications that has the same purpose as the one you are creating is to get inspiration and learnings from their mistakes and successes. Since the topic second screen is quite new it was hard to find successful applications.

To make sure that the evaluated applications covers as many categories and users as possible, the variety of applications was big; everything from games, music, and tv related applications.

3.4 Concept realisation

After the idea generation phase, sketches of the ideas were done to see the workflow and thoughts on paper. Only the concepts that were good in aspect to innovation and what is possible to do were taken into this step. These sketches worked as a tool for information and interaction flow. The second step in this phase was taking the sketches and making them more detailed and describe the functionality in wireframes. Wireframes shows the structure and architecture of an application. When creating the visual design the wireframes has all of the functionality and flows, and the visual design finalises the layout, look, and feel. The wireframes were also used to establish the functionality and relationships for the prototype.
The wireframes were created with OmniGraffle Professional, a program made for the purpose of creating wireframes and flowcharts. The initial design and all iterations was created in Photoshop and Illustrator CS6.

### 3.5 Prototype

The mockups contained the whole concept, but the prototype is focusing on only one important part of that concept. The created prototype was based on literature studies, evaluation of existing applications and innovative thinking of what can be done to enhance the experience for users. The prototype includes the functionality of watching a movie in a different way then possible today. It was implemented with objective-c to work on both an iPhone and iPad. To start implementing the prototype the first thing was to learn the programming language and then start implementing, the method used for that: trial and error.

The design for the prototype started with an regular pen and paper and then evolved to an real digital design by using all the steps in the design process. The interactive native prototype were created in objective-c and Xcode 4.6.
Chapter 4

Background

A background study had to be conducted in order to retrieve information and knowledge regarding the main subject related to this master thesis. Since second screen is a big subject, some information on what has been done before and why users want to have a second screen was relevant to find and understand, that information made it easier on occasions where decisions had to be made to moving on with ideas. Information that were important to know when developing a second screen application was also found during this background study. Already in the background study some problems and user areas was found, which were good since an understanding on how it had been done before makes it easier not to make the same mistakes.

4.1 Second screen

In today’s busy world where mobile devices allow users to be in a constant communication with social networks, each other and information sources, second screens can be used in many different ways[20]. It can be used to access information that can not be fitted to one screen without taking too much space, to control other devices or just to get a better experience. A second screen can also be used as a game module that can control things on another screen, where it is important that the two screens look and feel as one[37]. Except from controlling another device, a second screen can be used in different areas such as merchandise; engage audiences that are interested in buying products that are exposed on the show they are watching[3].

Watching television was once a social activity but has now been reduced to a passive and isolated experience[24], letting users integrate with each other through a second screen makes it a lot more social again. A way to use second screens together with other things than television are at events; watching live or located at the event. For users that are located at the event, watching recaps can be valuable if they can not see what is happening live or on a screen. If it is
an event where you want to follow a specific person, information on how it is
going for that person can be available and if it is possible, to see other camera
views which is interesting for both viewers located at an event and watching
on a screen located at another place. Making that possible, is giving another
dimension to the show or events for everyone.

There are four main usages for a second screen, to control, enrich, share and
transfer content[4]. A good example to why use a second screen is for users
that do not have a lot of time, they could ask the system to collapse a sport
event or game down to only the exciting and highly rated parts of a show or
program[24]. Then users will not miss the highlights and gets a quick review
of the most interesting parts according to the users at any place an anytime
they want.

Second screens have been spoken about for a while, already in 2009 Nielsen
was reporting about multitasking and the idea of Distraction as Entertainment[21].
There have been the possibility to interact with television by SMS voting or
texting for some while and it is working, which indicates that users see no
problem with using several devices to multitask[15]. People enjoy watching
television as a part of socialising in groups[26]. By integrating semantic web
techniques with interactive television developers are able to create smart ap-
lications that can run as extensions of television shows and stimulate groups
of users to communicate[11].

Online distribution is asynchronous, that means that viewers do not have
to see the show as it airing[3]. The viewers can watch the show at the time
they want. An example of second screen usage; a show is airing and the user
sees some things on the screen that looks interesting. On the second screen
that are synced with the show[34], users can buy products that are visualised
on the show, what it cost and all their personal information for shipping and
paying is already implemented. Then there is no barriers between wanting and
ordering[3]. This way of integrate companies in a personal device is a new way
of selling products. If this is created in a good, safe way, companies can reach
buyers in other ways than available right now. It also gives marketers a chance
to get to know their fans a little bit better[4].

Companies are engaged in the second screen and users like it, so now in
2013 it is a trend[32]. Second screen is a groundbreaking tool for brands[32]
in regards to selling products int he right context. Developers that figures out
how to get the viewers attention on both a first and a second screen makes it
easier for them to marketing and advertise to the right target group for their
product[20] and from that, sell more and focus on products that costumers
want.

Research has shown that accessing contents across different screens makes
the content more useful, relevant and informative[39] and it is stated that people
want to learn about what they are watching[43]. That means that having a
second screen is a good thing, something that will fill a whole that we have
today.

Interacting with friends, more options, select and control, saving time, more
information, reminders, personal services and giving users choices, these are important factors to why users want second screens\[37\]. Another aspect is that users want to watch different media on different devices\[40\], this means that the second screen should be available in different sizes and devices. The notion of a device to augment our memory is a reality\[12\], users should be able to get information from any device and any of the devices should be throwable anytime and without anything getting lost\[12, 16\].
Chapter 5

Second screen applications

In order to understand, develop and evaluate a second screen application that will enhance an experience, a basic approach needs to be determined. This chapter contains an in-depth study within the research field of second screen and important things to think about when designing for mobile devices and how to add a second device without taking too much attention from another device. Even though people are good at multitasking a second screen cannot just be added, there have to be some evaluation about the situation and environment.

5.1 Developing second screen applications

When designing for second screen the developer have to decide what to aim for; enhance the coverage for people who are at an event or replace the first screen coverage for those who are watching in front of the television or device[1]. Having a second screen is to balance the attention between what the user are watching and the device that they are interacting with[3]. The second screen can be used to display information or let the user communicate with others. In some cases, the user needs to focus on the second screen to receive the information, that means that the first screen comes second. To have this kind of function on an second screen shows how important it is for the developer to know where and when the application are going to be used and of course, why. For a device you use as a module, it is desirable for the device to sense pressure[37], that will enhance gameplay and the user experience[37] because the user recognises the way of using an additional product from their previous experiences with controllers. If we want to use the second device as an remote control has to be easy to interact with[31], easier than a regular remote control since the user want to watch the first screen and not the second one to understand how to switch channel.

The developer has to think about experience design, the right mixture between entertainment and needs[10]. To create the perfect second screen expe-
rience for everyone is difficult, it is hard to know which aspect that is most important, if it is about the social, the content or loyalty aspects [25].

5.1.1 Make it personal

When creating an application we want information about the user so we can make it as personalised as possible. Some of that information should be personal since users only want to share that with people they know or them self. An example is if there is a presentation over devices and the presenter do not want to show all the information to the audience. The presenter should be able to hide information from the audience and only display it for them self [2, 35], that functionality will help the presenter to know where in the presentation they are, what to say and what is on the next slide. The audience that are focusing on the big screen will see the information important to them and the presenter will see valuable information and comments to get the best conditions for a good presentation as possible.

On to the next challenge, which screen are the user paying particular attention to? It is difficult to know which screen the user is focusing on [43] and developers are competing for attention on the second screen, they are striving to aggregate the audience so companies can sell new, personalised and meaningful types of units [25]. And as the most important part, we want the experience to be as good as possible for the user. Depending on what the application on the second screen are created for, it needs to be quick and easily understandable. That means that the interface should be clear, have prominent buttons and information that leads the way for the user. With a quick look, the user should have gotten a glimpse of information that covers the reason for the second screen to exist.

5.1.2 Communicating on second screen

The key challenge for communication in applications is to dynamically distribute media content rendering and media control capabilities across the most suitable device surrounding the user in specific moments [15]. Even though people often want to talk while they watching television a distraction can result from trying to listen to a dialogue, follow the storyline and listen to chatter of others [42]. We do not want to distract the user with information that they do not want in that moment.

Voice chat is considered more natural and direct than text and makes it easier for viewers to watch the show while communicating [14]. Using multiple devices users complain about diffusion of information across them, despite the number and variety of available tools for transferring and managing information [12]. Another aspect of communicating during a show is when users are able to comment while watching an airing show, a delay while typing can make that problematic [16] cause it takes some time to write a comment and the moment that the user wanted to comment is gone and the other viewers
5.2. When to add a second screen application

do not receive that comment until later. Or maybe that the user do not want to miss anything of the program and do not take the time to comment, unless there are some way to pause and comment, then continue to watch the show.

5.1.3 Easy to use

It is important that the second screen is easy to use and do not take over the first device. Research shows that there is not a problem to balance the attention between a screen airing a show and a mobile device that users are interacting with, cause neither of them needs the users full commitment[3]. We need to fin a great balance between; easy to use, add value, enhance the experience and not needing full commitment.

First things first, is the application is hard to access and start using, no one will take the time to do that. If no one even starts to use what we have created, that application will not stand a chance against the other ones that is just plug and play.

Ease of use, multiple users, speed and efficiency all confers with cost and control[40], it is always about finding a balance between all needs. If we can fulfil those challenges we need to think about the accessibility on different devices. Availability at all devices is important but allocating tasks to different devices often has a software-licensing factor[12], which is important to think about when developing a new application.

5.2 When to add a second screen application

Television is about creating anticipation, building tension and wanting to witness a story as it happens. Television is extended online and unlike conventional online wisdom that states that everything should be on demand, a lot of success stories points in the other direction. People want to make choices by them self, when and where they want to watch television and they want to be able to watch the same thing that is on the television at that time anywhere. Interaction, competition, having an impact on what is on television are often more meaningful and successful for users than statistics and background stories in synchronisation with a program. Users want to make the choice by them self, if they want more information or not. The added application should give as high value for the user as possible so they fell that they are gaining something by having a second screen. At some shows and program users are so involved in what is happening on the first screen that they do not have time to watch something else. So developers has to know what kind of show the screen are going to be used together with and how involved the users are in that show.

People are social and drawn to large groups of people. The excitement a person feels being in a stadium full of people is different from a person’s home where they are alone. Before adding a second screen anywhere, the situation and everything around the show/game/event should be thought about. Some-
times the focus is on other things than a mobile device. If applications are developed to an event it is important to think about in which moments the application are going to be used.

Social networks combined with scheduled events that are interactivity combined with something personal creates something meaningful to users. And making an event out of television show that the user can integrate and feel a part of is a powerful idea. When a second screen application is used, it is often on a personal device so the user has invested their personal space to your application, for a brief moment of time, make sure that the time is well spent.

5.3 Advantages

Using a second screen is a common approach for people that want to improve their productivity[38]. A study states that productivity increases at an average of 42% when using a second screen[38, 29]. Another study found out that test workers has a 20% reduction in errors and reduce of stress when using two screens[38]. An advantage for advertises are synchronisation advertise, which means that an advertisement appears on the second screen in real time. The advertisement on the second screen allows the user to instantly act, get information or give feedback directly to the advertisers[44] that are showing their product or offering on the first screen. The second screen application could yield a goldmine of subscriber data that can be fed to advertisers who could turn the information to target advertising. That is an opportunity to target advertising better, so a 65 year old grandmother does not need to sit through commercials for acne medicine, while her grandson will not have to see products directed to his grandmother. Since the commercials will be more precisely targeted, there will be fewer of them in total so the networks can charge more money for more targeted ads, which also will be good for the consumers.

Today it is common to have controls to operate different products at home where each product have their own control. This means that the number of controls will increase with the number of products. A second screen application can reduce the amount of controls by acting as a remote control for all devices in a home[22]. Research has shown that users want browse between all alternatives on television when they are watching, preferably on another device[13] to get an overview without missing anything on the show they currently are watching.

There are several games where you play with a map to find your way, communicate with other players and have a lot of features and all this information are visualised on a single screen. With an additional screen, it is possible to move this information to a second screen so the user can get a quick overview of where they are on a map, see if someone says something on a chat or what is possible to do in a game. It is important for people who work where much space on the screen is a requirement, to fit all the information on the screen visible and easy to get quick overviews of that information. Adding a screen for
some of that information, a summery of the information or functions makes the workflow speed up and the user have control over that information and what happens. When you are giving a presentation, the personal device visualises the presentation in a personal chosen way, with comments and an overview[7]. So except working as a control during a presentation an addition of a screen also means more space to show information for presentations and explanations. With a second device you can not only be prepared, but also control the presentation.

Addition of a screen is not just a movement or enlargement of a screen, it also provide the user with other dimensions of information and angles. For a user at an event, this screen can function as a flow of information or as a second pair of eyes. The user can take advantage of multiple camera angles and watch it when they feel like it. The second screen can also function to constantly keep you up to date and make it possible to watch short reruns of programs. A second screen makes an anywhere anytime availability. When users watch programs together each person can have their own unit synchronised to the program. Which makes it personal, users get to choose what they want to focus on.

5.4 Disadvantages

When adding a second screen a risk of distraction is also added. Despite the advantages in productivity there are also some disadvantages. While adding a screen is a potentially good thing for communication purposes, without some resistance to distraction it could also be a productivity killer. It really depends on the workflow and personal preferences.

As stated before, viewers are not paying 100% attention to the TV shows in the way they use to, nowadays the viewers are using their mobile device while they are watching something on the first screen. Juggling two devices during a show can be disruptive, especially advertisers has to rethink on how to explore advertisement for the users[25] to get them focused on the TV during the commercials. Roughly 40% of the viewers use the second screen to check information related to the program[28]. For advertisers the challenge is to find and keep the viewers attentions during the commercial breaks.

5.5 Sustain users

The application needs to come out to the market so people know that it exists[25], after they have dowloaded it, we need to sustain them and make sure that the experience is so good that they are coming back. If we get users to like the application, they will recommend it to their friends and family. Not covered in this thesis is marketing, retention and conversion, but the ones responsible for the user experience in the application need to think about getting users back in to the webpage/application. First, how can we reach out to the
users and make them download or visit the site? Second, if users are starting to use the application, how can we keep them and make sure that their experience with our application will enhance with usage? And the last step, if we can get users to start using our application, can we give them some reward so they will keep coming back, recommend us and when they have not used the application for a while, can we contact them in some way to remind them of our application.

"First impressions matter", an application has to make an impression for the users[30] from the beginning. When the users have tried it for the first time the impression has to be good enough that the user will return. Research has shown that 74% of the users will launch the application they have downloaded for at least one more time[30]. That means 26% of the applications are used only once. It is also shown that 35% of the Apple device users opens their applications eleven times or more, compared to Android users where it is only 23%[41]. These numbers are low and important to think about when developing an application. The most important aspect for a new application is to satisfy a need. If the application gives the user more value than it costs to start the application they will return. To sustain a user it is important that the application helps the user with something. It can be to get information, learn something new or just to pass the time. If a user likes the application the first time they used it, it is almost certain that they will come back and try it again.

Engaging the users in the subject of application are important. The user should feel like they have control and they can decide what will happen next. That the application is their tool to achieve something, not the other way around. Integration of social features makes it possible for users to interact with others and that is an feature that can make the users seem as the application is made for them and make the user stay. Competition are something that can make users use an application for several times just to beat them self or others at that challenge. If the application give users additional information that are related to what they are doing at the moment, they will feel like it gives more value to use the application than not using it. The more the users are engaging in the application, the simpler it should be to use; it can be the personal aspect of saving account details or changing the information depending on what the user are doing in the application. One way to engage users is to launch an application that are related to a specific happening. Users that are interested in that event will hopefully download or visit the application. A launch of a new product should relate with the users in some way, for example; interesting topics, launch of a product or a tool that can help with everyday chores.

The challenge is to stand out and differentiate the application against the competition.
5.6 Enhance the experience for users

Enhancing the users experience can be done in different ways. People like different things but there are some things that research\cite{17} has shown will enhance the experience;

- **Users in control**, allowing them to interact with the interface and make their personal settings for the application and let them make the choice of what they want to do, the application should not force the users to anything.

- **Focus on one thing.** People want to do, not think about doing things. So the application should be straight forward on what is possible to do and how to achieve that easily.

- **Simple and easy to understand.** Users want to make choices but not too many, so do not add choices if they are not needed.

- **Let it shine.** Applications that has a good design will have advantage if something is not working and for an application to attract users it needs look good.

- **Make it work.** Users need an application that actually works. If the experience is going to be good, their should not be errors.

- **Get social.** Integrate social media so friends and family’s content can make it more personal and relevant.

Using a second screen is an opportunity to understand more about how the users are thinking. What they are exited about and interested in since their engagement on the second screen can be reflected on the first one, regarding to second screen used together with TV shows. Users want more details and information when watching TV and the second screen is the most convenient way to satisfy that real-time curiosity. We can let the users find their information by them self, using search engines. But we can also make sure that their experience is as good as possible, by helping them on the way. If the users are using a second screen while watching, we know whats going to happen on the show and we can use that information to change the actions and information to what we think our viewers what to see and know more about. The second screen can not be a distraction, it should enhance the experience by being helpful for the user, fulfilling their wishes in some way.
Chapter 6

Related work

The goal for this thesis is to create a second screen application that are innovative and enhance the users experience. To make that application as good as possible and get inspiration an evaluation of the existing applications were conducted.

The applications that have been analysed have one thing in common, social networks. Integration of social networks make it possible for the user to share content, thoughts and comments about shows and see what their friends are watching. In some of the application is it possible to communicate with other viewers live and sometimes the comments are included in the show[18], that means the users can watch the show anytime they want and still get comments at the same time as the user commented according to the shows timeline.

Some of the applications let the user synchronise with the show by just listening, then the application feeds the user with information about the show, the products and clothes they are using and which music that are plying. Some of the applications uses this synchronisation to let the user check-in to different shows, these check-in results in coupons and helps the application to be more personal by learning from the users actions. The coupons act as a rewards for the user to make them come back and give them something for their actions. Most of the applications gives suggestions on what shows the user should like according to shows that they have watched and some applications turn the device in to a remote when it has been synched. Another way of making it personal is showing keywords from the program the user are watching and present them in lists that gives the user information related to the keyword when they click on it, this feature are included some of the applications. A lot of the applications give the user the possible to buy things through the device and make it easy to find products from the show.

Some applications that has been evaluated works only for a specific show or movie. These applications contain sketches, animated figures and cut out pieces from the show/movie. These are filled with information and can be used after and before the user has watched the movie. To get a deep understanding of the
second screen applications some application are analysed further in subsections below. As stated before there are some aspects that research has shown will enhance the experience for users, design, functions, values and social aspects. Also personal aspects, choices and how to start using the applications. These aspects will be analysed in all applications.

6.1 Zeebox

Zeebox combines social networking and mobile commerce with synced second-screen content, aiming to make television “a more immersive and social experience than ever before[21]”. The application is available both on the web and as a mobile application that makes it available for all users with a smart phone or a computer to use Zeebox. For televisions that are web-connected the application can serve as remote control[21]. The application synchronises with the television and feeds the user with information of the program. The application extracts the exact content from the show and shows some keywords as a tag with information. When a user clicks on a a tag, they will get more information about that show, with the tag as keyword. When products are displayed
6.2. NextGuide

on the screen, they are also available in the application so the user can buy the products from the device directly. Zeebox gives the user the availability to comment on shows and see what others have commented when they have logged in with Twitter or Facebook, the user can still make a choice to be anonymous when commenting. Users can watch shows together and comment on a public or private chat. Making the chat private to anyone you want to invite. Users can be at different places, watching the show at the same time and comment about happenings on the show using the chat. The public chat allows any user of Zeebox watching the same show to comment so everyone can see.

The design is easy to integrate with and gives an overview of the social features integrated. The background color is grey and menus are displayed with black, orange is the accent color used for buttons and numbers for the statistics. Using grey and black as the background makes it easier for the users to see what is important cause it is highlighted with orange. As images Zeebox are using pictures from the shows to be in the spotlight of the application. Social networks work as ground for all the statistics in the application. Appart for the integration of social networks, the functions let the user see what shows that are airing, how many viewers, information on the show and related applications that can be downloaded. The application gives information on what shows are airing and when users change the time on a timeline, the guide for the shows follows, so the user can see what on all the different channel at a specific time. As stated before, the application also works as an remote.

Tags are extracted from the keywords of the show and are clickable and displays information from different websites so the user is one click away from finding more information. By adding the zip code, the television guide changes to fit the users according to where they from. When the application is used, the user has a choice whether to show information on what they are watching or not. If the user chooses to show information, they can also see what friends are watching.

Zeebox does not need any set up, users can start to use it directly and browse between channels by categories To comment on shows the users has to sign in with a social network account. Television guide display shows what are airing at every channel in a timeline for everyone and if the user want the guide to be more specific to them, they have to add their zip code and television provider. The application is available for iPad, iPhone, Android and on the web.

6.2 NextGuide

Next guide is a mobile application that helps users to choose what to watch next. The application combines live television, Netflix and iTunes. Next guide let users browse recommended shows depending on what the user has watched before, what is popular at the time and friend’s choices. Users can chat with
Chapter 6. Related work

each other and get an overview of what friends are watching, their favourite shows and actors. The applications consists of a dashboard where the user can choose what categories of shows they want to browse between. Black is the main color for the application and white for the text-background. All shows are visualised with their own promote picture. There are a lot of menus and it can be hard to get an overview of what is possible to do. NextGuide uses the dashboard so the user can be inspired, when the user has chosen what to watch they can do that directly in the application.

![Landing page for the NextGuide Remote with Free TV Guide](image)

NextGuide have a feature that reminds the user of that show before it is airing. To make the reminder-function work the user has to manually choose that in the application. On the mobile device, the application is used as a remote control and guide. The mobile application do not have the dashboard-view or ability to show programs directly in the device. Users can follow each other to receive information on what others like and are watching.

Channels, genres and categories sort the shows and the user can create their own categories to make it personal. It is also personal in that way that the application keeps track over favourite actors, sports and channels and let the user browse shows that contain what the application thinks the user want to watch. This can be made as personal as the user wants, the choices are many and can be hard to make on a small screen. That is probably why NextGuide...
only is available on iPad. Social networks are integrated so users can see what their friends are watching and browse content that friends like but users can not comment on anything. When starting the application for the first time the user has to fill in some information about what equipment are used to watch television or shows. NextGudie are available on the iPad and iPhone. For the iPhone the application has functions as an remote control but does not include the other features.

6.3 Miso

![Figure 6.3: Trending TV series on Miso](image)

This application strives to make television more fun, Miso[23] want to make a diverse application that fits all users cause everyone loves television for different reasons. Synchronisation is provided through listening technologies using audio- and time code marking within the show[39]. The application give users information about the characters, music and products displayed. The application can be used anytime, Miso allow viewers to select the show of their choice and join the conversation with others in their network even if the show is not being aired currently[39]. Users can chat with each other, answer questions, vote and get insights about shows and characters. They can also watch clips
and see popular quotes from different shows at anytime.

Miso-application are overall black and white and uses a range of colours in the background to make it more fun. The menus are black and the text-background and check-in has white background. By using the white background for personal pages and black for the others these functions are separated from each other. The application has an interface that are easy to understand and to know what is possible to do. The website is only about the personal functions and uses white and grey as colours. Check-in are done by a click at a button and the application does not know if you actually are watching or not. When checking in the user earns badges and can have followers and follow friends and users of the application. Earning badges are used to show others how many shows the user have been watching.

Information integrated in the show are done only by the users. When creating a comment the users choose at what time it should be displayed in the show. When users want to make a comment on the show they receive frames from the show and can also create questions and voting for the different shows. By letting the users create the information in the application it can be difficult to know if the information are accurate or not. Miso is only available on the iPhone and gives the user information on everything there is to know about a show and characters in the show. Without signing up or using a Facebook-account the application cannot be used.

6.4 IntoNow

IntoNow is an application that synchronises with the show you are watching by listening to the sound for only four seconds. When the application is synchronised it lets the user comment on shows, share what they are watching and think about using social networks and they also receive information about the shows. The application can be used without synchronising to a television, some episodes are available to watch directly and some clips from shows that have not been aired are available in the application. Users can always vote for characters and shows so the application can create a top lists. While the show is airing, all music that is playing and all the characters on the show are displayed in lists so the user easy can find what they are looking for.

Colors for the menu and background are black and grey except for those spaces that are for comments and friends. The colour-coding makes it easier for the users to know if the fields are intended for the shows or if they are social. The design makes it easy to use in all screen sizes and interact with it. While users watch the shows they can take pictures from a specific moment, comment that picture and share with other users that are watching the same show. Statistics from sports and the latest headlines are updated and available for the users. This application are social. Users can comment on the different shows, chat with each other and see what others thinks. The music that are used in the show are listed and easy to see and download. The application
explains all the parts of the show, if characters in a show says something that are not obvious, the application gives the user information about that with the right timestamp so nothing are spoiled. IntoNow works on iPhone, iPad and Android.

![Sports on the TV with the connected IntoNow application](image)

**Figure 6.4: Sports on the TV with the connected IntoNow application**

## 6.5 Get glue

GetGlue is both a web and mobile application that serves the users information about shows, what is trending and an easy way to keep track on what they have been watching. The main feature for this application is to check-in; to let the application know what you are watching. These check-in results in different ways as rewards. This application is actually used by other second screen applications for that check-in feature. GetGlue check-in is for music, movies, trailers and books, so that those in the social networks can exchange thoughts, likes, dislikes and feelings about any particular channel or show in their online communities[39]. GetGlue uses blue as the main color in the application and the background is grey. There are a main feed for activities from all the users of the application. When a user has logged in they can start checking-in at shows and then sort the feed based on the media the user has checked-in at.

When the check-in has been done the user receive stickers and get sugges-
tions on what show they should like. The digital stickers users earn can be send home to the user as real stickers for free. Users receives a guide on what shows are possible to see and can send messages to users. When checking in the user can see how many others are watching or listening to the media. When entering the check-in page the trending media are displayed. Users can inter-act with other users that share a similar interest according to what they have been watching. A feed that includes all media available and sorted based on what the user have checked-in at. When checking in, the user can choose to post that on social networks. The user profile displays all the activity from the user. Adding the zip code to the application the feeds are made more personal according to where the user lives.

![Figure 6.5: The main functionality for GetGlue - stickers](image)

GetGlue are available at the web, iPhone, iPad and Android and let users follow each other. The application can be used even if you don’t sign in, unless you want the check-ins to be saved. The functions are basic but that probably why it is so popular and integrated in other applications.
6.6 Shazam

Shazam started as an audio-recognition tool and calling itself a “media discovery company”[21]. An on-screen logo cues users to open the Shazam-application, which then synchronises with the television. It recognises what the users are watching or listening to by the sound. For music, the application show users the artists, the name of the song, songwriters and shows a music-video with lyrics. Some new features for this application are to synchronise with the television and show some other camera angels and information on the other screen. Social networks are integrated so users can see what others has comment, when artists that the user likes releases a new album and get emails from the application with digest from the tags. Shazam uses other applications to provide all information available. Shazam is an application that are mainly in the color blue. The background for the application are black and for the desktop version it is grey. In the middle of the menu there is an icon for Shazam, by clicking on it the application starts to listen and figures out what users are listening to or watching. All the music that are found by Shazam can be downloaded directly in the application. Information about music and the characters of a specific show are displayed with a timestamp so the users know at what time the song is playing and the character are visible. The user can

![Figure 6.6: The Shazam Player](image)
discover new music based on what others have been listening to. Users can see what their friends are watching or listening to if they have logged in with a social network. All users can also share thoughts with others. Shazam can be used on all platforms available and is easy to integrate with. Users can start using it by just launching the application. For every check-in of music or show a tag is made, so the users can get an overview of their activities.

6.7 Prometheus second screen

![Figure 6.7: Overview of the application: Prometheus second screen](image)

Some applications are created for a specific show or movie, like this application. Prometheus second screen is the name of the application and lets users see unused content, clips from behind the scenes and information on the characters. Sketches from the movie and animated figures of the monsters are available and the application can be used while watching the movie and get related information. By synchronising the application to the movie users get thoughts about scenes and how the movie has been produced.

Since this application are created for a specific movie the design is focusing on making the application an extension of the movie. All pictures are from the creation and the overall design is based on how the movie looks and feels. Prometheus second screen has a social feature where users can comment and talk about the show. The application itself does not have these functions integrated, the users are moved to a social network. The application are available on both Android and Apple devices and it can be used without signing up. If users want to talk about the show with other users they have to log in on a social network.
6.8 Chrome super sync sports

Chrome has created an web based game where an mobile device act as a control. The game is developed with HTML5 and CSS3 for the style and audio and web sockets are used to make an real time collaboration between the devices. The second device controls everything on the first screen and there were three games available when Chrome super sync sports were released in 2013. It can be four players at the same time playing this game and it is easy to synchronies the mobile and computer, the only thing users needs is Chrome as a browser. All mobile devices with a browser can be used to play this game.

The design is very clear and colourful and the integration is easy to understand. By using clear and visually icons and buttons the game describes it self. The functions included in the game are few and simple so the user can start using it directly. Social networks are not integrated in the game, but users can share their score at any social network.

6.9 Red bull signature series

This application uses a new way to navigate in mobile applications. Red Bull Signature Series are action sports programming to NBC and the NBC Sports Network. When the television is airing the program, it displays in the application. Users can comment during the show and the comments will stick to
that precise moment. If someone watches the program after it has been aired, the comments will show at the same time as they were conducted, according to the programs time. This means that users can comment live and take part from each other’s comments. The live experience can be recreated when users watch old clips. Since the comments do not appear immediately but at the time they were created, the experience will feel like watching live. The application are available on the web and for Android and Apple devices and can be used directly when downloaded. The application are about extreme sports and that are displayed in the design with colours that are used are mainly dark.

6.10 Summery of related work

All of the applications that are reviewed in this thesis have a social feature integrated. Some of them are for sharing, some for making comments and see what friends are listening to and watching. The social features for commenting and adding information are included in the applications that are all about movies. Some of the applications are showing statistics about activity, that information are from the social networks, how many users have logged in and are using it at the moment. Social networks have been used to support television watching from their inception. Since all of the applications that has been evaluated are second screen they are available at mobile devices, some of them are also available as websites. For those who are available at the web, television guidelines are the most common functions. For applications that also is available at an mobile device the function are often an remote control or to check-in what they are watching.
Synchronisation between the different devices are done in different ways depending on what the application are created for. For example: one way of synchronisation is to let the application listen to the sound and figure out what the user are watching. Another way is to generate a code for two browsers at different devices so they can pair up. Some applications let the user sign in at as many devices they want and the account works together. After the synchronisation have been done the applications works as remotes, television-guides and information feeder for the users. One of the application reviewed gives the user other camera angels then on the television.

To summarise, second screen applications can be used for many different reasons. The applications often has social media integrated as well as payment information to make it as easy as possible for users to buy, send and retrieve information. All of the second screen applications have one single hero functionality.
Chapter 7

Realisation

The prototype for this project is conducted to see if the idea that was generated can work. The final choice of idea was to create an application that can be synchronised to an television or a big screen. There are some available movies, documentaries and sports for the user to watch on demand. When the user has synchronised the two screens they can browse between all available content and watch the program directly. The users need to have an account if they want to take part of all content.

When a program starts, the second screen becomes an remote, that controls the media rendering on the other screen. Users can at that moment start watching the movie in 360 degrees at the additional device. They can see what are happening in all directions whatever is displayed on the primary screen. This will give the users the choice to watch what they want and, stop and pause at any time they want. An additional feature to this is when the users click on one of the characters, the program pauses and start searching for information about that actor. Users will now receive information about who the actor is, age and the most popular movies they have been apart of.

This application includes the important parts of a second screen to enhance the experience according to the literature studies. Users can make their own choices, they decide if they want to see more of the movie and if they want additional information, they are in control. Users can interact with the interface and make some personal settings for the application, if they want they can comment about the show with other users by logging in to social networks. The application does not force the users to do anything. The main function for this application is to see the same media on two different devices but on the additional one, see the media rendering in 360 degrees.
7.1 Device

All the applications that have been analysed for this project are available on an iPad. Most of them are also available on other devices, but then they have different functions than on the iPad. The functions are narrowed down to remotes and an easier version of a television guide. If a user wants to use one of these second screen applications, they need a bigger device such as an iPad to get access to all the functions and the applications main area of use. The second screen project for this thesis let the user watch another view of a media displayed on a television. The users can navigate to see the media in 360 degrees. To get a good view as possible the user should use a big screen, but not so big that they won’t want to hold it in their hand during watching a program on another screen. Therefore an iPad is the perfect choice for this application.

7.2 Functions

The main function for this prototype is the possibility to watch a program in 360 degrees. The user can browse between movies they want to watch. From the application they can start the movie on the primary screen. So the application works first as a remote control, then when the movie has started, they can watch that in more angles, 360 degrees. The reason that the user can browse and start want they want to see from the application is to make sure that they don’t need to get up from the sofa.

When the user pauses the movie a still image is shown. Then the user can click on the different characters shown to get more information about them. The information that are shown can be information about the actor, what they are wearing and what movies they have been working on before. This functionality gives the user in-depth information.

Browsing through movies is one of the big actions users are going to use this application for. The movies are listed in an alphabetical order so the user can find what they are searching for. But we also know that sometimes the user might not know what they are looking for, they just want to see a movie. Therefore the landing page of the application displays the movies that we think the user wants to see, based on friends and what they have watched before.

7.3 Wireframes

Wireframes shows the structure and architecture of a project and connects it to the visual design that helps to establish the functionality and relationships in a prototype. For this application wireframes were created to show all of the functionality, layout and structure.

Navigation for the application is sticky in the left corner. Showing favourites that the user has chosen by themselves, making movies accessible. This is a good
functionality while watching a serie, since most of the user wont watch the whole series at ones. Having the functionality of favouring makes the application more personal. The second option in the navigation is recent, that displays movies that the user previously started to watch. The third option is movies, where all of the movies are listed in an alphabetical order instead of based on the users.

Figure 7.1: The navigation for the application

The user needs to sign in to the application before using it. After they have signed in for the first time, the application will remember their credentials for the next time. From any view, the user can search for the movie that they want to find.

The landing page for the application is a dashboard of shows and movies that we think the users want to see or are interested in. What movies and shows that are listed here are based on favourites, recently watched and featured items.

When the user clicks on one of the cover pages of the movie a section slides out showing more information about that move. A rating based on what the user and others think, the year the movie was produced and a short description of the movie. For some of them even a trailer of that move are available. The user some options from this view, close it, start watching, add to favourites or watching the trailer.

Before the user can start to watch the show on another bigger screen the two screens needs to be synchronised. the functionality for the synchronisation is not implemented and decided in this concept.

The player for the movie is different on this second screen then on the bigger one. On the application the user can use it as a remote putting two fingers on the screen and circling their fingers to change the volume or fast forward the movie. They can also play and pause at any time.

An idea was when pausing the movie the user can click on the different
actors showing. The application will then search for more information about them. This functionality is a concept that would be nice to have since we know that users want to know more about what and who they are watching. This functionality means that all of the available movies should need to be tagged of each and everyone that were in it and link that tagging to more information about the actors. Since this needs a lot of manual work for the ones that are going to tag every actor and there are today no such database, this functionality is not included in the concept.

Figure 7.2: When the user clicks on the search icon in the menu this section is shown
Figure 7.3: The landing page of the application are showing suggestions of movies.
Figure 7.4: Clicking on one of the movies a section is floating in from the right showing more information.
Figure 7.5: While watching a movie the user can change the timing, volume, pause and play the video. And look at it in 360 degrees
7.4 Visual design

The design for this prototype were done in several steps. Starting by using a pen and paper to sketch all of the possible ways of doing this. Later the design evolved and the choice of design was to let pictures from the different programs speak for them self. The iteration of the mockups, both in design and wireframes was done by a big group of people to make sure that the solution would actually work.

![Figure 7.6: A design mockup for the landingpage](image)

The landing page design ended up with a dark background and big images of the cover pages for the movies. Since the cover pages are well design and can speak for them self, they should be in focus when the user scrolls through all available movies.

The navigation and headlines are white to create as big contrast as possible. So the functionality of changing the volume and timing for the movie, the controllers are displayed in white to crete a coherent design feeling throughout the application.
Figure 7.7: When pausing the movie these controls appears. The user can from this view change the volume, timing and resume the movie. By using two fingers and circling them, they control the volume.

### 7.5 Implementation

This prototype are implemented with the programming language objective-c. The functions that this prototype have is to show a specific movie in 360 degrees. The other functions of the application are tested in other ways, but this function that are the main one are implemented so users could try it, evaluating to see if it works.

To implement this kind of 360 degrees movie an sphere where conducted in OpenGL. As an texture to this sphere the movie was put on in an played, the camera was put in the middle of the sphere and let the user turn the device to see the whole sphere. As an texture of an OpenGL-circle a movie can not be played directly. So the solution to that was to play the movie in the background and take all frames and update them on the sphere.
Chapter 8

Discussion

Writing a thesis like this often starts with a plan, setting up dates and goals for what should be done. The same for this project, in the beginning a schedule of work that contained in which order the different processes was going to be conducted were made. The schedule specified the timing in weeks and the dependencies for the different sub goals. I started off really well, was ahead of the schedule for the first months, reading and creating more than I had anticipated. The schedule was refined a couple of times to keep up with the work that was being done. Despite those changes, the schedule for this projected looked really good. Looking back at the difference between the planned work and the conducted work process, they were quite linear until the third/fourth month in to the project. That was when I started to do actual work for the agency where I was doing this thesis. It started off with related work to this subject of second screen but quite quickly escalated to more work. So instead of just working with this thesis, I actually got to try how it is to work for real with applications and actually project for second screens. With that being said, all theory and reviews of other applications had been done and put in to words in this thesis. The same for the wireframes, design and creation of the prototype. So instead of just writing and working on my own project, I got to work with real clients within this subject. Learning by doing.

Even though all of the actual work for this project were done and most of the information for this thesis were written I should have followed the initial plan to finish this thesis within the time schedule that I put up for my self. Instead of finishing this in 2013, I decided to pause it and finish it off in the beginning of 2016. A lot has happened in three years for this subject. Since the thesis was written, the only thing left was finalising the wording, adding images and making sure that everything was right, the only thing that has happened since 2013 is just that.
8.1 Prototype

The project resulted in a working prototype. It was conducted in the native language objective-c and working on an iPad. The solution included a video where the user could look at it in 360 degrees. I was very pleased with that result and since I did not know the programming language when I started the solution was even better than I could have guessed. Looking back at that decision, of learning a language, creating an application that was this complex, I should have thought that through. I learned a lot about it and I did what I set up to do but it was harder than I thought. The prototype could have been done in a different way, including more functionality of the actual application instead of just that one. But in the same time, that challenge I put up for my self and that I did it, is a win in a lot of ways. The main functionality for the application is to look at a video in 360 degrees and there are no such applications out there today. That solution was good to explain my result, at the agency and at presentations I have held about this subject.

8.2 Subject

This subject was quite new when I started to write about it and search for information. Because of that I needed to be creative when gathering qualitative information. I research several articles, applications and other agencies that was currently working on second screen solutions. I was lucky enough to realise that the agency I was doing my thesis with were working on a big second screen solution for an even bigger company. That application became my biggest inspiration and I was lucky enough to actually work on that project. Starting with that project it felt quite hard to know what I was going to focus on and what I could bring to that group. But with all of my research and interest in the subject, it was a match. Without that real project I think that I would not have done this much research and effort to find qualitative information for this.

8.3 Solution

The solution for an application in the second screen area were quite comprehensive when I look at it now. The 360 degree view of a video is enough. That is a big thing that should have been not just the center of the application, but the actual solution. The application also includes browsing between vides, personalisation and more information about the actors in the movie. Looking back at this, I should probably have focused on one solution earlier to finalise that one instead of having a prototype for one functionality that I wanted to be the main one. And to have wireframes for the whole solution. And as if that would have been enough, I also created design for the application. If i were do to this thesis again I would focus on creating one functionality for an
application and iterated that until I have found the best one. After creating that solution I would have tested it and iterated again based on the findings from the test.
Chapter 9

Conclusions

The goal for this thesis was to enhance an experience with a second screen application. Before starting with the concept some aspects needed to be researched. The goal for that research was to find information on what you need to think about when designing for a second screen and how to integrate that screen without taking all of the attention from the first one.

This section will summarise conclusions, give some final suggestions for the concept and some learnings for second screen development.

9.1 Functionality

In the end, the functionality of the concept and application different due to time limitations. The reason for deciding to develop a native prototype was to see if there was any chance for this concept to actually work in real life. The technology is there to make this happen, but to shoot every movie in 360 degrees may be to time consuming thinking about the value. Narrowing the concept down to some movies and sports this idea is not far from reality.

Revisiting the findings from reviewing other applications the result was that a second screen application should include:

- Social integration
- Personalised information
- Available at different devices
- Functions of the application
- Easy setup

The findings are a summary of all application and what they have in their solution. It is not suggestions and rules for creating the best second screen application. All of the application that were reviewed had the functionality
stated below and looking at reviews and articles about them was referring to these statements. The set up was not always easy for all of them, but the reviews stated that it was necessary to change that in order to get more users.

**Social integration:** The final solution does not include a social integration. During the concept phase an idea that included commenting were looked at. That functionality should have let the users to comment during the movie and their comment will be visible for others at the timing that they were commenting. Since the focus for the application is movies we found that comments from others is more distracting than wanted so that idea were scoped out of the solution.

**Personalised information:** We can see that the concept realised in wireframes and design mockup includes personalised information since the suggested movies and sports on the landing page are based on the user. What has previously been watched, what have the user liked what the suggestions are based on. The user can favourite movies so they will be easy to find and a menu selection is to see recently watched movies. That functionality help users not just to find a movie that they have seen, but also the ones that they have started to watched and want to resume watching.

**Available at different devices:** The concept is presented as a tablet solution that are available for iPad. The reason for that decision is to give the user as big of an image as possible, but that does not exclude availability on other devices.

**Functions of the application:** By functionality it means that the application should not just present information. It should also let the user to interact with it. The concept includes a lot of functionality. It works as a remote controlling the first screen, volume, timing and the movie that should be displayed. It also have the functionality of scrolling between available content. Functionality related to content is browse, recently watch and favourite.

**Easy setup:** Starting the application the user needs to register for an account in order to save data for later and be able to sign in to other devices and have the same experience available. Every time an application have the functionality of saving or suggesting data the users need to have an account, so users are use to signing in. Synchronising the first and second screen needs to be easy, this solution does not include that functionality since it depends on how it would be solved technically. The idea is to synchronise with the first screen with available technique.

### 9.2 Workflow

The 20 week plan contained the following steps:

- Setup goals together with agency
- Research regarding second screen
- Idea generation and sketching
9.3  Learnings

Creating a prototype to enhance the experience has a lot challenges. All of the research and iterations of ideas resulted in a concept that achieved what was stated in the beginning of the project. A big learning from that is to try to narrow the functionality down in to the most important ones. Users want to have an application that solves a problem, that is way they are downloading it. To solve a solution the application needs to identify a problem that the potential users are having. Instead of setting up goals for a specific subject, it is better to look at the users and what they want.

The same goes for the prototype and projects, the reason for the prototype to include just one of the functionality is due to timing. A prototype can be conducted on paper sketches, as clickable prototypes or as animated mockups. In this thesis the prototype were conducted as a native prototype, which is not needed. If I were to do this again I would have focused on the application and solution, not the actual prototype. The reason for having a prototype is to show others how you want it to work, it does not need to actually work.
Chapter 10

Future work

I see that this concept have a lot of potential. The next step for future work with the concept is to do usability reviews for the prototype. The idea needs to be tested with end users to see if there are any further improvements for the application. Since the work was conducted in 2013 and the finalisation is done in 2016, there are some new technology out there to include in to this concept.

So based on todays knowledge there should be some more investigation regarding the theory and other application. The agency, where this thesis was written, has since I started with this thesis worked with many clients regarding this subject so there are a market out there that are ready for this kind of applications.
Chapter 10. Future work
Chapter 11

Limitations

Due to time limitations and the decision to develop the prototype in native language objective-c the prototype did not include all of the functionality. Doing this prototype as a native working app might have been too ambitious, and ambition are time consuming. One of the reasons not to include the functionality to browse between and interact with the movies was because there were no database of the media. To create this type of application all of the content needs to be available in some way.

There were more work around the subject than might have been necessary. One of the projects that I have worked on for this thesis is with an actual client. It resulted in a lot of information and learnings for this thesis, but regards to timing, it could have been during a shorter timeframe.
Chapter 12

Acknowledgements

I would like to thank everyone that have supported and contributed with this thesis.

- Everyone at Monterosa AB for the support and help
- Per Kvarnbrink — Supervisor at Umeå University
- Robin Hedin — Interaction designer student at Umeå University
- And I want to thank my family, for great support during this thesis and for supporting me in everything I do as they have, my whole life.
References


