A User-Centered Program Format for Mobile TV

DAVID SAADAT

KTH Computer Science and Communication

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A User-Centered Program Format for Mobile TV

DAVID SAADAT

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Supervisor at CSC was Alex Jonsson
Examiner was Nils Enlund

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Royal Institute of Technology
School of Computer Science and Communication
KTH CSC
SE-100 44 Stockholm, Sweden
URL: www.csc.kth.se
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Abstract

The purpose of this study has been to develop a user centered program format for a future mobile TV service. The work has focused on user centered research methods to gather sufficient data from users. Methods used have been: survey questionnaire, focus groups with users, and seven exploratory interviews with experts on mobile TV. Scenarios and schematics have been used in designing of concept.

The results show that users are interesting in a combination of broadcast and on-demand mobile TV. Interesting content to watch on mobile TV due to the survey questionnaire were news, sports and music. According to the two focus groups, user generated content and on-demand content were also interesting program formats for mobile TV. Based on results from the user study, six concepts were developed. After concept evaluation with experts, one final concept was further developed and is presented by schematics and scenarios.

The final concept for a future mobile TV program format focuses on larger local events such as music festivals or other events that attracts a big audience. The aims of the program format are to entertain and inform event visitors through mobile TV. The service is a combination of on-demand and broadcast content to enable both active and passive usage. The results from this study are a guide to functions users asks for in a mobile TV service. It is also a result of what the telecom industry believe is technical and economical feasible.

Ett användarcentrerat programformat för framtidens mobil-TV

Sammanfattning

Syftet med studien har varit att utveckla ett användarcentrerat programformat för mobil TV. Studien har genomförts med användarcentrerade undersökningsmetoder för att samla in information från en tänkt målgrupp och experter.

Undersökningsmetoder har varit: enkätstudie, fokusgrupper med användare och sju djupintervjuer med personer verksamma inom mobil TV från sex olika företag. I designprocessen av programformatet har metoderna scenarios och schematics använts.

Resultatet av studien visar att målgruppen är intresserade av en kombination av broadcastad mobil TV och on-demand. Enkätstudien visar att nyheter, sport och musik är mest intressanta program format. Fokusgrupperna visar förutom traditionella program även ett stort intresse för användargenererat innehåll och on-demand tjänster. Utifrån användarstudien togs sex koncept för framtida programformat fram som senare presenterades för experter inom mobil TV. Utifrån experternas tankar och idéer kring mobil TV generellt och de utvecklade koncepten valdes ett koncept till grund för fortsatt utveckling.

Preface

This master’s thesis was written as the final part of the Master’s Degree of Science in Media Technology at the Royal Institute of Technology (KTH).

I would like to give a special thank to my two tutors, Dr. Alex Jonson at KTH and Sofia Svanteson at Ocean Observations for giving me support and feedback during the work. I would also like to thank everyone working at Ocean Observations for always being there with support, feedback and great times. I have had a wonderful time with you all.

I would like to send kind regards to Brian Laffan at 3, Gunnar Slott at SVT, Johanna Johansson at Telenor, Lars Ljunggren and Anders Kälvemark at Ericsson, Per Werner at Teracom and Alexander Knudtzon Alvevi and Sigrid Norrman, Talpa Scandinavia. It was very interesting to meet and discuss mobile TV with you. Your knowledge has been very valuable for this thesis, thank you all!

I would also like to thank all participants who decided to spend some of their time in the survey questionnaire and in the focus groups.

Last but not least, I would like to give a special thank to PhD. Vernon Avila, Raquel Avila, and Marcus Vasques Osorio for all the help and support with this report.

David Saadat
Royal Institute of Technology
Stockholm
2007
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1. Introduction

The purpose with the introduction chapter is to understand why this report was written and what the aims for this thesis are.

Traditional linear television, as we know it, is about to change. The former passive way of watching television is becoming more active. Interactions with SMS, games, and, user-generated content are a few of the new services that entering the television medium.

It is no longer necessarily to consume television at fixed times and places. The Internet behavior, to consume media when as a user conveniences, is getting closer to the television world. People download and watch their favorite shows at other times when they want to. Broadband and portable devices enable users to be more flexible. We are standing here facing a future where the mobile phone will just not be a phone but an important multimedia device for new services.

Mobile TV is just one service amongst many that has developed due to progressive technology, and as this report will show that mobile TV is dependent on several actors. The technical development has lead mobile services forward. Mobile phones are equipped with higher quality components than just a few years ago. The 3G networks are getting more accessible, which enables more consumers to use more advanced services and also enables users to stream motion pictures with better quality than before.

To assure that the new technology reaches the market, it is important to understand how to best use new technology. Therefore, the understanding of the end user is important when new services are developed. To be able to make mobile TV a popular and useful service, user research has to be done to determine what the end user wants in a mobile service. Most businesses working within telecom and the mobile industry are aware of that, however, working with user-centered questions is difficult since conditions change rapidly. New technologies result in new prerequisites and new services, which makes the study of user-centered questions more difficult. More work needs to be done to better understand the actual end-users needs and practices to be able to develop relevant mobile TV services.

This thesis is written on commission by the design bureau Ocean Observations with offices in Stockholm and London.

1.1 Objectives and goals

The thesis investigates mobile TV from a user perspective with user centered research methods. Based on research findings, a future mobile TV program format is developed. The program format is a futuristic concept aimed for the telecom industry to utilize when new mobile TV services are developed.

1.2 Target group

Target group for this report is aimed for mobile operators, the telecom industry, production companies, content providers, TV stations, universities and others who have an interest in mobile TV.
1.3 Problems

Research demonstrated that mobile TV has a capacity to become more than regular television. However, the industry needs to know more about the end users needs and how media is used to design profitable mobile TV services.

- What is a useful and interesting program format for mobile TV?
- What types of contents are interesting to watch on a mobile phone?
- Is mobile TV linear television on a mobile phone or can mobile TV become something else?

To answer these questions, it is important to understand both users and stakeholders. There are many stakeholders involved and working within mobile TV and this thesis will investigate these problems from a user perspective as well as from a business perspective.

1.4 Limitations

Results of the thesis could be seen as a guide to a user centered mobile TV program format. However, no discussions are held around the social consequences of the result since that cannot be done without an existing service. Areas such as economy are discussed but only to a minor extend the focus is more technical and user orientated. In general, working from a user-centered perspective often results in data from different areas, which cannot be eliminated since it is important to approach the problem from several areas. Consequences to areas connected to the problem are discussed but not investigated further.

The developed concept is also demonstrated as a prototype using scenarios and schematics. Scenarios are to better understand the program formats functionality. The scenarios also describe the user situation and how the concept could be used and implemented. Further on, the prototype demonstrates how the program format functions and how users can interact with it. The prototype just focuses on one specific concept to show its potential in terms of interaction, usability, format and content. It is beyond the scope of this study to develop a concept for several different types of programs.

This thesis has a time limitation of seventeen weeks. The time limitation made it difficult to conduct user tests of the developed concept. By testing the concept on users would most probably result in redesign of the concept.
## 1.5 Terminology

<table>
<thead>
<tr>
<th>Term</th>
<th>Definition</th>
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<tbody>
<tr>
<td>3G</td>
<td>Third generation mobile standards. Enables’ operators to offer users a wider range of more advanced services while achieving greater network capacity.</td>
</tr>
<tr>
<td>DVB-H</td>
<td>Digital Video Broadcast- Handheld. A technique used for broadcast of mobile TV.</td>
</tr>
<tr>
<td>GPS</td>
<td>Global Positioning System. Is used for navigation and position of the device.</td>
</tr>
<tr>
<td>HSPA</td>
<td>High-Speed Package Access. A collection of mobile telephony protocols that extend and improve the performance of existing UMTS protocols.</td>
</tr>
<tr>
<td>MBMS</td>
<td>Multimedis Broadcast Multicast Service. A technique used for broadcast using the 3G networks.</td>
</tr>
<tr>
<td>On-demand</td>
<td>A way to decide when to use a specific content. Could come with a cost.</td>
</tr>
<tr>
<td>P2P</td>
<td>Peer-to-Peer is a way to send content between two or more persons</td>
</tr>
<tr>
<td>RSS</td>
<td>Really Simple Syndication. Subscription of content to the devise</td>
</tr>
<tr>
<td>Streaming</td>
<td>Sending multimedia content from a transmitter to a receiver using a mobile network.</td>
</tr>
<tr>
<td>UMTS</td>
<td>Universal MobileTelecommunication Systems. Is one of the third generations cell phone technology.</td>
</tr>
<tr>
<td>Unicast</td>
<td>Sending information packages from one source to one single destination</td>
</tr>
</tbody>
</table>
2. Background

This chapter presents the background in mobile TV based on academic reports, business reports, books, websites and articles. The literature is summarized and analyzed to better understand what mobile TV is and what the barriers are.

2.1 Research

Currently there is no existing broadcast mobile TV service in Sweden. The literature study on broadcast mobile TV services have been limited to studies done in other countries as well as the pilot projects on mobile TV in Sweden and Finland. This research aims to better understand mobile TV in general and to get an overview of what other research has shown.

2.2 What is mobile TV?

There are several ways to define mobile TV. Nilsson et al (2006) says the mobile phone shall be a standard phone where television is added as an extra function, such as SMS, MMS, Bluetooth, and Camera. The mobile phone in general has limitations in screen size and battery life, which makes watching motion pictures less suitable for longer periods of time.

Ericsson defines mobile TV as a combination of handset and television in one portable device (Ericsson 2007). Ericsson continues and says mobile TV is an extension of traditional television moved to a tiny screen. Mobile TV provides the convenience to watch live television content anywhere and at any time.

This personal device enables personalized content, such as push video clips and highlights from sports events. Mobile TV provides a more interactive television experience than traditional television. Features such as chatting and voting are more accessible when watching television on a mobile phone (Ericsson 2007). Mobile TV converge two existing industries: the telecommunication and the broadcasting industry (Rautio, Anttila & Tuominen, 2007). Combining the strengths from two big networks, a whole set of new services could be invented. Regarding the customer, mobile TV will be an extra function for the mobile phone and should therefore work as simple as possible to become a commercial success (Andersson et al. 2006).

The definition of mobile TV is in many ways confusing since traditional linear television is most often thought of as a home activity. For purposes of this thesis mobile TV is defined as “Motion Pictures in a mobile phone”.

The word television has such a strong implication, which might result in people expecting the same experience as they do on a big screen television at home. But mobile TV is not regular television; it is a combination of television, Internet and video.

Television elements in a mobile TV service are important for users to recognize themselves on the new television platform. Recognizable elements are preferably used in the start up of new services. Further on, well-known user behaviors could help users to readily adapt new services. However, a mobile TV service must be innovative and new user behaviors and elements needs to be added to complement already existing behaviors. Mobile TV behavior could therefore be a combination and extension of linear TV and the Internet fitted in a mobile platform.

“The fact that the video community website YouTube has 65,000 uploads per day proves that interaction can turn a passive coach potato into an active
Mobile TV services are a relatively new experience. Ericsson predicts in a report that by 2010, mobile TV will be watched by 116 million people (Ericsson, 2007). Herald Tribune International newspaper journalist Eric Pfanner goes even further and claims that 291 million people worldwide will use mobile video services by the year 2010 (Pfanner, 2005).

The mobile industry is facing new ways to use the mobile phone. Mobile phones are not just phones, they are multimedia devices with the abilities to listen to music, play games, chat, take pictures and watch video content. This new device opens up for new services to enter the market (Andersson et al. 2006). But what services would be compatible with the small device and what makes a service successful? Mobile TV is one of the upcoming services the telecom industry is hoping to be the next big thing that generates new revenues. The mobile phone as a device is fairly unique in its kind due to its personality for many users and ability to be carried around all day long. This creates an attractive channel for television to deliver personalized content to the user.

2.3 Transmission techniques

Consumers in Sweden today can only access mobile TV as streamed video in the 3G networks since no broadcast alternative is available. Broadcast mobile TV is still in the testing stage and not yet available in Sweden. However, there are several different techniques to broadcast mobile TV but in this paper, the main focus will be on two techniques. The first technique is MBMS (Multimedia Broadcast Multicast Service), which is a way to broadcast mobile TV through the existing 3G networks. The second technique is called DVB-H (Digital Video Broadcast-Handheld). A more specific description about these two techniques is discussed in chapter 2.3.2.

According to the Swedish media service provider, Teracom, the next generation of Mobile TV will be broadcasted with DVB-H (Digital Video Broadcasting-Handheld), the same technique regular television uses today (Teracom 2007). Broadcasted Mobile TV enables unlimited amount of users to share the same program without any quality reduction since it is a one-to-many transmission. Streamed Mobile TV, on the other hand, is much more dependent on the network service and the numbers of users watching the same content at the same time (Joint Mobile TV Group, 2006). When the 3G networks are used to transmit content, it is as a one-to-one transmission called Unicast.

From October 9, 2006 to January 31, 2007 a broadcasted mobile TV pilot test was running in Stockholm using the technique DVB-H. The result showed a positive user opinion of watching broadcasted television in the mobile (Teracom, 2007). Similar Mobile TV tests in Finland reflected results similar to those in the Swedish pilot test with DVB-H (Nokia, 2007). In the Swedish pilot, thirteen television channels were used in the terrestrial networks for mobile TV. The program format was the same as terrestrial television but shown on a smaller screen. Results from Finland show that participants not only wanted familiar programs but also content designed specially for mobile TV, however, no particular program formats for special made mobile TV content where mentioned in the report by Nokia. The same report also showed patterns of users watching mobile TV at different times than traditionally prime time. Swedish users mainly watched mobile TV on traditional prime time, which is different compared to Finland (Teracom 2007).

There is no set standard of how to transmit mobile TV. Current techniques for transmitting mobile TV is mainly through the 3G networks or by broadcast. The 3G networks have both advantages and disadvantages when utilized for mobile TV. Content transmitted live over the
3G networks is dependent on the networks coverage and the networks coverage affects the quality transmissions.

### 2.3.1 Unicast

This technique, Unicast, is used for transmitting mobile TV content through the 3G networks. Unicast transmits content from a single source to the mobile through a separate channel. That means content is transmitted separately from one single source to a single destination (Ericsson 2007). Each consumer chooses what type of content they want to watch and when. This way of transmitting content is dependent on the number of users at each mobile cell simultaneously. More users at the same time will result in reduced quality of service because one signal has to be shared by several users. On the other hand, Unicast always comes with a return channel, which is used to interact with content.

In the report, “Changing the way we look at television” by Ericsson 2007 the capacity of using Unicast is discussed. They use a frequency of 128 kbp/s and claim 32 concurrent parallel mobile TV users can stream from the same cell and carrier with Unicast. According to Ericsson, today’s peak rate for HSPA (High-Speed Packet Access) is 14.4 Mbit/s, but will most likely increase in capacity over time, which enables more simultaneous mobile TV users as well as higher-definition services. HSPA is a collection of mobile telephone protocols that extends and improves the performance of the existing 3G networks, also known as UMTS (Universal Mobile Telecommunication System). More than 90% of all launched mobile TV services worldwide are based on existing two-way cellular networks (Ericsson 2007). That fact is due to the lack of other competing techniques and is supported mainly by the mobile operators. Mobile TV is a way for the operators to gain traffic in the existing 3G networks. Unicast can be used as long as the number of users is relatively low. Therefore, mobile TV with Unicast will be best suited for on-demand and niche programs.

![Unicast Diagram](image)

*Figure 1. The figure illustrates Unicast over the 3G networks as a One-to-One transmission. Source [http://www.forum-tv-mobile.com](http://www.forum-tv-mobile.com) 2007-09-04*

### 2.3.2 Broadcast using DVB-H or MBMS, are there any differences?

Broadcasting is a way to transmit one video and/or audio signal to a broad audience, mainly used for radio and linear television. MBMS is using a standardization called 3GPP (the 3rd Generation Partnership Program). It is a proposed standard for transmitting video via the networks of mobile operators (Anderson et al. 2006). When numbers of mobile TV user increase, broadcasting will be the best alternative since it is independent on numbers of users watching simultaneously (Nilsson et al. 2006). However, MBMS is not yet a complete standard; it is an extension to UMTS, which has not yet been standardized for television frequencies, which has to be done before MBMS can be fully implemented (Nilsson et al. 2006).
The main difference between the two techniques is that DVB-H uses existing television frequencies while MBMS aims to broaden existing cellular networks with broadcasting abilities for television frequencies (Nilsson et al. 2006). According to Ericsson, this technique will allow one traffic channel to be shared by all users that are watching the content simultaneously in the same area (Ericsson 2006). In his book, Anderson adds that MBMS is particularly efficient when there are many users in the same area that use the same cell of radio coverage. However, he states that MBMS is not likely to replace the use of Unicast for customized content where users have the freedom of watching content when it suits them the best (Anderson et al. 2006). A big advantage with MBMS is that it could be implemented in recycled spectrums, which will result in more spectrums available for several actors, for example mobile operators, who can own a spectrum of its own (Nilsson et al. 2006). MBMS provides a total capacity of 1.6 Mbps per 5 MHz WCDMA carrier, which results in 12 broadcasted channels per cell using a frequency of 128 kbps per channel (Ericsson 2007).

![Diagram of MBMS](http://www.convergedigest.com/images/bp/TTP/digitalfountain-fig2.gif) 2007-09-04

Figure 2. The figure illustrates the broadcasting technique MBMS. Source: http://www.convergedigest.com/images/bp/TTP/digitalfountain-fig2.gif 2007-09-04
<table>
<thead>
<tr>
<th>RANGE</th>
<th>DVB-H</th>
<th>MBMS</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>26 mobile TV channels (256 kbps mobile TV channel bandwidth, 6.6 Mbps total bandwidth/frequency channel)</td>
<td>5 (reused spectrum) x6 mobile TV channels (256 kbps mobile TV channel bandwidth, 2 Mbps total bandwidth/frequency channel)</td>
</tr>
</tbody>
</table>

Table 1. The table shows an estimated comparison between DVB-H and MBMS considering channel bandwidth and frequency spectrum. Source Nilsson et al. 2006

DVB-H on the other hand is an extension of the existing terrestrial digital television standard, DVB-T, to better suit the battery life of mobile terminals. One terrestrial digital television channel demands 4-5 Mbps for each channel while a DVB-H channel only needs 0.2-0.5 Mbps. Bit rates vary from about 5 to 12 Mbps, flexibly divided into channels using a bandwidth from 8 to 5 MHz and spectrum band from 470-750 MHz (Nokia 2007). DVB-H broadcasts in bursts, which result in less power consumption of the device. This is improving efficiency since the receiver can power-down whenever possible, which extends the battery life. This suits the mobile phone well since it has limited battery life. However, DVB-H requires a new access network and spectrum allocation to be able to be used globally (Anderson et al. 2006).

![DVB-H](image)

Figure 3. The figure illustrates broadcasting using DVB-H. Source [http://www.forum-tv-mobile.com](http://www.forum-tv-mobile.com) 2007-09-04

DVB-H delivers live broadcast content to users with unlimited amount of viewers. This is particularly well suited for popular programs since there is no quality lost due to numbers of viewers as with Unicast. Nokia and other mobile suppliers have devices that can handle DVB-H and tests have been done in many countries including, Sweden, Finland, Australia, Germany, Malaysia, South-Africa, Taiwan, UK and USA with positive results (Nokia 2007). As Nokia states in their report, “Delivering the TV experience to mobile devices: DVB-H: Live broadcast Mobile TV”, DVB-H enables simultaneous broadcast of more than 50 channels and interactive television programs over a single frequency network. DVB-H delivers content in one way and cannot be used for interaction itself, but running DVB-H on a 3G mobile phone makes interaction accessible. Power saving is an important issue with mobile phones and DVB-H uses time-slicing to extend battery life. Time-slicing is data delivered in short bursts at set intervals. When there is no data to deliver, the tuner powers down, saving energy. This means receivers are only active for about 10% of the time (Nokia 2007).

The choice between DVB-H and MBMS is currently a matter of standardization. Most of the tests have been done on DVB-H so it is likely that will be standardized. However, MBMS uses the existing 3G networks, which results in low investment costs. Another aspect using a combination of Unicast and broadcast is the return channel that enables interaction. According to Ericsson, this is the ideal solution to be able to deliver the kind of experience mobile TV viewers will want for the future (Ericsson 2007). Prerequisites for implementation of DVB-H
are in most parts fulfilled. The technique is relatively well suited for the terrestrial networks and mobile devices with DVB-H receivers start to reach the market.

2.3.4 Pushed content to the mobile phone

Ericsson consumer lab made a concept study of pushed content in January 2007 in Germany and the UK. In the report by Anders Kälvemark, “Pushed content- A beauty or a beast?” he points out some user thoughts about the concept on pushed content (Kälvemark 2007).

Pushed content compared to broadcast or live stream has several benefits for the end user who decide when and what to watch in the portable device. Content is transmitted when traffic is low through the 3G networks, preferably at night, which results in new content for the mobile phone. The technique is suitable for users who want to follow a specific interest and who do not want to miss their favorite television shows. Other benefits are ease in switching between channels and the quality of service. Since content is downloaded and stored in the device, content with higher quality can be transmitted which results in a better user experience compared to streamed content. Users can for example gain deeper knowledge of particular fields of interest by subscribing to desired programs. It also has the advantage of allowing the user flexibility to stop and play content at own desire.

According to Kälvemark, there are still some user doubts considering this technique. Subscription as a term is often considered negative due to the cost that often follows. Many Internet services are free to use and the word subscription could be a barrier for new users to sign up for the service. Unfortunately, the word “free” could easily be misleading. Internet and television services often come with a subscription cost or get paid by license and therefore are not free, even though they seem so. That cost is most often forgotten when subscription costs are discussed. Another issue is the capacity of mobile phones memory, with increased content entails quicker memory exhaustion.

It seems users are more willing to pay for content if it comes in high quality and is of the right kind of interest to the user. Further on, users want content with personal interest. Another aspect to be aware of from the user perspective is to be in control over what to watch. If content gets pushed out uncontrolled, the user experience will fail. However, younger people like to decide and watch content spontaneously and might find it hard to make decisions of what to watch in advance. Control is according to Kälvemark an important user issue since they are afraid of getting too much unwanted content that exhausts the memory.

Students tend to be more interested in user-generated content like YouTube that are seen as a separate genre and does not necessarily have to be in a constant stream (Kälvemark, 2007). While user generated content and services increase on the Internet, a new way of distribution has showed to be effective among the users, Peer-to-Peer (P2P). P2P publishing is a way to send content between two or more persons. P2P most often occurs between friends but also at community-based services. Content is transmitted based on what users like to watch and friends’ knowledge about personal interests. This behavior is very different from linear television but has the advantage that users receive content they like rather then spending time searching for it. It is an instant way to share content between users, which result in instant feedback of sent content. Instant feedback can work as a filter to what content friends enjoy or not. P2P preferably uses Internet links, which also makes it interesting to use on a mobile device because memory capacity issues and time spending on download content are reduced. This is a way to subscribe to content without signing up for a subscription. Compared to content sent randomly, content sent by personal recommendations and interests from friends is more likely to be viewed.
2.4 TV for small screens

TV screens are getting bigger in size and have higher resolution due to flat screen displays. High Definition TV (HDTV) enables us to watch television on bigger screens with higher resolution than regular television. Why do we need to watch television on a small screen with lower resolution?

Mobile TV is not meant to replace the big screen television it will only complement it. Therefore, it is important to know what type of television content that is best suited for the small screen.

“As people get more used to personalized content, interactivity and time-shifting in the living-room, they won’t accept anything less when they’re on the move”

Ericsson 2007

Even though their television content can be accessible in the mobile phone, it is still a matter of the user’s situation if the service is used or not (Andersson et al. 2006). They continue and say: “mobile TV is good to show highlights, for example, from soccer games instead of showing the full game. Users would most likely rather watch the entire game on a big screen television or live at a stadium."

2.5 Issues with the small screen

An important issue rises when watching motion picture content on a small screen is the Quality of Experience (QoE). The QoE of the service depends on the perceived visual, audio and textual quality of the consumed content (Knoche, Sasse & McCarthy, 2006). The authors continue and claim that image resolution is a central concern for all actors involved in the field of mobile TV. Another issue when watching motion pictures on a small screen is the format of content. In the same study by Knoche, Sasse and McCarthy results show that close-up pictures are more delighted to watch on a small screen than wide shots. Shot types are a way to express feelings and help the audience to read the message in the context. The book Designing for small screens suggests complex scenarios and camera-panning techniques with action focus should be avoided since it is difficult to follow on a small screen (Studio 7.5, 2005). In Asia, content creators produce short-time special made mobile TV soap operas that rely on close-up shots and not much dialogue. However, special made content requires additional process to prepare material, and should preferably be used for special made mobile TV stations if broadcasted (Knoche, Sasse & McCarthy, 2006). Results from mobile TV pilot studies show that users are interested in watching mobile TV for shorter periods of time therefore, length of content is important. Television is a motion medium where picture and sound works together. A good television service is dependent on both. A smaller screen can be compensating with satisfying sound quality. Internet video content is often produced for a smaller screen. By studying similarities from other media it could be detrimental to what type of content to be interesting for mobile TV.

2.6 User experience

Traditional television is most often watched at home. The remote control enables the user to fast channel switching and creates a passive way of watching and selecting content. During high commitment shows people tend to plan their viewing ahead of time and change channels infrequently and are less acceptant of outside interruptions. On the other hand, when viewing on low commitment basis, people tend to make more changes and allow other demands and activities (Knoche 2005). In the same report from Knoche, studies show that people who are interested in watching television are not interested in the interactivity part with the television content. The disadvantages of mobile TV are high costs, low battery life, small screen and imperfect coverage (Knoche 2005).
2.6.1 Interactivity

Interaction is frequently discussed when talking about mobile TV. Interaction is one aspect that differentiates mobile TV from linear television.

Hübel, Theilmann and Theilmann (2007) write in the report “I just want to see the news” - *Interactivity in Mobile Environments*:

“Mobile TV marketers are announcing Mobile TV as a new interactive media, however users seemingly ‘just want to see news’ but cannot imagine using interactivity”.

The feasibility of mobile interactivity begs a couple of questions since it is already stated that interactivity does not work out well for traditional television. What will make users interact with television content when watching on a mobile device? What kind of features creates a satisfying user experience that makes people interact with content?

Interaction issues are important to understand although this is not a major focus of this thesis.
3. Method

This chapter describes how the different research methods in the data gathering process have been used.

The literature study in chapter two was to gain a deeper understanding of mobile TV in general. It also had the purpose of describing and explaining terminology as to better understand the technology involved with mobile TV.

The target group for data collecting was specified to people with an age between eighteen to thirty-five years old. This group is thought to be potentially able to pay for a mobile TV service as well as having interest in new technical devices and services.

In order to gather as much data as possible from the end users and experts, the work has focused on user-centered problem solving methods. Methods used in this study have been: survey questionnaire, focus groups and exploratory interviews.

In the design process of a future mobile TV program format, methods used have been: scenarios and prototyping.

These user-centered methods are known to generate sufficient and rich data. Combining different techniques and methods are ways to secure different perspectives and confirm findings, also called triangulation (Preece, 2002). Triangulation is a way to investigate a problem from different point of views to be able to question or confirm the results (Bell 2005).

As mobile TV is a rather new service for Swedish consumers, it proved difficult to locate active mobile TV users. Therefore, the decision was made to approach the topic by study user behaviors from similar medias such as, traditional television, Internet and general use of mobile services. However, questions concerning mobile TV were asked to both users and experts to better understand their opinion about future mobile TV services. This way of gathering data is also used by Rautio, Anttila and Tuominen in “Bundling of information goods: a value drive for new mobile TV services”. The aim has been to find out trends that work well on television, Internet and mobile phone services to see if they can be adopted in a mobile TV service.
3.1 Workflow

To get the broad user opinion about general mobile services and mobile TV

Concepts of future mobile TV program formats

A future mobile TV program format based on user and experts thoughts.

Prototype to visualize the result of the study

My personal thoughts and discussion of the study and the results

Literature study to get background information about mobile TV

Discussing mobile TV. Collecting ideas to generate program format concepts

Discussions about mobile TV and the concepts with experts on different fields to identify the problem from more then one area

Written stories regarding functions of the program format in an actual user situation

From a user-centered perspective this is a guideline to a future mobile TV program format

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Figure 4. This figure illustrates the different phases during the thesis work. Idea was to start the data gathering process broad and to specify the work more at the end, based on results from the study.

3.1 Survey questionnaire

Survey questionnaire is a quantitative and well-established technique to gather data from a wide range of users. The design of the questionnaire is crucial because the response rates tend to be low and responses may not be what you expect (Preece, 2002). It is also important that questions are clear, specific and easy to understand to minimize the risk of misunderstandings. Users thoughts are most often important when a new service is designed and questionnaires are an effective method to collect data and draw conclusions from a bigger population. A survey questionnaire is a quantitative research method.

The idea of starting with a questionnaire was to understand the target groups’ opinion regarding general mobile services, television and Internet. The questionnaire gave insights about users opinions regarding mobile TV. The questionnaire was also a way to get a wider general opinion about the usage of Internet, television and the mobile phone.
The design of the questionnaire was to encourage participants to leave personal comments after the questions (see Appendix 1).

Before the official questionnaire was dispensed, a pilot study was carried out on a test group of five people to measure reliability and validity of the questionnaire. Some corrections and changes were made before questionnaires were handed out in Stockholm City, March 2007. Twenty-five people were randomly chosen and asked to voluntary fill out the form. Participants were informed how the collection of data would be used and the purpose of the study. The focus when handing out the forms was to secure a representative age range, occupation and gender to be fairly equal.

![Gender and Occupation Diagrams]

**Diagram 1.** Shows the distribution between men and woman in the survey questionnaire.

**Diagram 2.** Shows the occupation of participants in the survey questionnaire.

![Sample Age Diagram]

**Diagram 3.** Sample age from participants in the survey questionnaire

As diagram 3 shows, the majority of participants belonged to an age group with people younger then thirty and total respond rage varied from eighteen to forty-one. The sample age fulfilled the criteria for the target group’s age range. The total number of participants was twenty-five divided into eleven men and fourteen women.

All of the twenty-five respondents returned their forms, which resulted in a 100% response rate. Random sampling was used in the selection of participants since it is hard to cover up an entire population (Bell, 2005). After the data evaluation of the questionnaires, some user tendencies could be drawn out, which served as background information for some of the questions discussed in the focus groups.
3.2 Focus groups

Focus group is a method to use when collecting data from a representative sample of typical users by discussing specific topics in groups (Bell, 2005). The benefit with focus groups is the allowance of diverse or sensitive issues to be raised that would otherwise be missed out, in for example a survey questionnaire. The method assumes that individuals develop opinions within a social context by talking with others (Peerce 2002). A focus group is a qualitative data gathering method.

Two focus groups were formed to generate ideas for program formats and discuss user experiences about mobile services. The first focus group included only students since results from the questionnaires showed some variations in the way students answered. This focus group consisted of five students, two women and three men, with ages between twenty-three and twenty-seven. None of the participants had been involved within the survey questionnaire.

Using one group with students only was a test strategy to find out whether the different answers in the questionnaires were a coincidence or if there were any differences between the two groups.

The second focus groups purpose was to some extent discuss up-coming ideas from focus group one, but also to generate new ideas for program formats. This group consisted of four people who had jobs, two men and two women, with ages between twenty-five and thirty-two. The aim was to discuss the same questions as with the students and to test some of the ideas that arose from the first group. Using two different groups increases the reliability of the results, if the results turn out similar.

Open research questions were used in both focus groups to encourage discussions between participants. My role as a facilitator was to guide the discussion in the direction I choose. It is important that everyone in the focus group discusses equally and that no one dominates the discussion. It is also important to maintain sufficient flexibility to follow unanticipated issues as they are raised during discussions. (Appendix 2)

Both focus groups started with a personal presentation of participants and the facilitator. Participants were informed about the objectives and goals for the focus groups. Both sessions were video taped to make the transcription part easier. Before starting, participants were informed about the purpose of video capturing and how it would be used. None of the participants disagreed, or had an opinion of the videotaping. The time for each focus group was set to two hours.

Start-up topics to discuss were to be intentionally “easy” to ensure everyone in the group would participate in the discussion, which is very important when conducting focus groups. When the discussion was on going, more specific questions regarding mobile TV and program formats were discussed. Pushed video-to-download content was also shown on an iPod video to demonstrate motion pictures on a small screen. Content shown were subtitled news and documentaries.

None of the participants showed any problems of displaying personal thoughts or opinions, which resulted in rich data from both groups. All data was later transcribed and analyzed and six different concepts were developed based on results and ideas from the both groups.

3.3 Concept developing

Concept developing is an innovative procedure, which is mostly dependent on personal ideas and thoughts. Background information to the different concepts is the data input from the user study.

The different concepts for a future mobile TV program format were based on results from the two focus groups, the survey questionnaire and personal thoughts. Concepts were developed to
match user’s criteria of a mobile TV program format and available technologies. The concepts were later presented and discussed with experts. The six concepts are described in Chapter 4.

3.4 Exploratory interviews

Unstructured interviews rise from a specific theme and tend to be more of a conversation over the specific topic where both parts give their opinions and thoughts (Bell, 2005). Benefits of unstructured interviews are the rich data they generate and that new thoughts that have not yet been considered can be further explored (Preece, 2002). Exploratory interviews are a qualitative data gathering method.

Typical in the evaluation of unstructured interviews, is that there is no attempt to analyze data in detail. Instead, the evaluator makes notes, and/or, records the sessions and later goes back to note the main issues of interest (Preece, 2002).

The purpose of these interviews was to collect information about mobile TV in general from a wide variety of companies involved with mobile TV as well as to test and discuss the developed concepts from the user research phase. The interviews were an opportunity to get experts opinion about the developed concepts and to discuss the results from the research. By discussing the different concepts from a business perspective, some ideas could be eliminated and others further investigated and developed into one realistic mobile TV program format. The final concept is a combining result of what the users and stakeholders asked for in terms of a future mobile TV program format.

The interviews also gave me the opportunity to gain deeper understanding of mobile TV from different business. To understand the barriers for mobile TV are important when new program formats are developed.

Selections of participants were made to obtain a wide data input and opinions from several companies working with mobile TV. The interviews returned specific and valid information about each company’s perspective about mobile TV and their thoughts of future mobile TV service.

Interviews with more then one company gave the thesis a more objective approach. However, these interviewers do not include all actors but can be seen as a representative sample. Mobile TV involves several actors and it is important to understand them all when new services are developed. Experts’ opinion about the developed concepts was useful to better select one concept to develop. Seven exploratory interviews were carried out to discuss and test results from the user studies. Participating interviewers and companies were:

- Gunnar Slott, Project Manager Mobile Services, Swedish Television (SVT), Content Provider, 07.05.22

  *SVT is the only public service TV station in Sweden and has a fixed budget to spend on programs to broadcast and content to produce. Highlight content are often showed on prime time. I found it interesting to discuss mobile TV with a non-profit organization.*

- Brian Laffan, Nordic Product Manager, Tre (3), Operator, 07.05.22

  *Mobile operator Tre is known for their edgy approach in the mobile industry and is ahead when it comes to mobile services and application. The operator Tre was chosen to discuss the future mobile TV service and this was an opportunity to get Tre’s opinion about the developed concepts.*
• Johanna Johansson, Telenor New Business, Operator, 07.05.23

Telenor is another operator on the Swedish market. It is interesting to compare different companies in the same business. Concepts and future mobile TV services were discussed with Telenor.

• Lars Ljunggren, Strategic Product Manager, Ericsson Multimedia, Telecom, 07.05.24
• Anders Kälvemark, Head of BU Program, Ericsson ConsumerLab, Telecom, 07.07.03

Ericsson was chosen to get a more technical approach from the telecom industry. Ericsson Multimedia works with new technologies and the Consumer Lab works with user research. Both areas are covered in this thesis.

• Alexander Knudzon Alvevi, Executive Producer, and Sigrid Norrman, Project Manager, Talpa Scandinavia, Production Company, 07.05.25

Talpa Scandinavia is a production company that develops program formats for new media platforms. The developed concepts were discussed with Talpa to get feedback and hints of future mobile TV program formats.

• Per Werner, Teracom, Distributor, 07.05.29

Teracom is the biggest media distributor in Sweden and were involved in the DVB-H pilot in Stockholm. Teracom and Ericsson advocate different ways of transmitting mobile TV and a comparison between the two was thought to be interesting.

Participants were contacted personally and were briefed about the thesis and the purpose of the interviews. All interviews were conducted at each representative’s office, except from Lars Ljunggren who was interviewed at the Royal Institute of Technology (KTH). The interviews started in different ways depending on company and each person’s special area of expertise. No questions were written down in advance. Since each interview was unstructured, unexpected areas regarding mobile TV were also discussed.

Every session was recorded and compiled. Before any results where presented officially, every interviewer had the opinion to read and comment the parts they had participated in.

3.5 Final concept developing

The final concept is an innovative idea developed based on results from the user research and experts opinions. The decision to further work with one concept was due to the limited time for this project and the positive feedback about the concept from the interviews with experts. The concept grew from one idea from focus group one. The idea was to use mobile TV as a local television platform for example ski resorts. This idea was discussed in focus group two and finally, further developed based on comments from expertise and personal thoughts. The final concept is a combination of interesting features from the upcoming ideas from both focus groups. The functions within in the concept were of the kind that both experts and I believed could be interesting in a mobile TV program format.
### 3.6 Scenarios

Scenarios describe functionality of a service based on written stories with human activity (Preece, 2002). Purpose is to understand the service and the user situation to get a realistic feeling of future services.

The purpose of scenarios is to complement the prototype and to display an actual user situation with words. Scenarios are commonly used to express proposed or imagined situations to help in conceptual design (Preece, 2002). Scenarios were designed to better understand the user situation of the concept and its functionality.

### 3.7 Prototyping

Prototypes are built in order to answer questions and used to get feedback on emerging designs (Preece, 2002). Different kinds of prototypes are used in different stages in the development iterations. Low-fidelity prototypes, such as paper-based scenarios are often used earlier in the design process and high-fidelity prototypes are more often used later on in design.

In this thesis, prototypes are used to describe the interaction design for the concept. A prototype makes the concept easier to overlook, but also shows how the different user interfaces in the service are connected to each other. Schematics are used as prototype in this project to present the functions presented in the scenario. The schematics describe the torrent between the different functions and how the user interacts with the concept. Schematics were first drawn by hand on a paper. After evaluation of the drawings, schematics were designed and redesigned with the computer and added to the scenarios. Due to the time limitation for this thesis, no user tests have been able to conduct on the prototype. Testing the prototype on users would most likely result in useful input for redesign of the prototype.

### 3.8 Validity and reliability

- **Reliability** is a way to measure how reliable the data collecting method is. This thesis involves question surveys, focus groups and exploratory interviews. Method selection was due to good personal experiences working with them. All questions in the survey were designed with help from my tutor and people outside this project. A pilot study was done to secure reliability of the survey questionnaire.

In the process of designing questions for the focus groups, all questions were reviewed before the focus groups took place to ensure reliable outcome. That is one way to secure results is not dependent on unreliable questions, which affects the out-coming result positive.

- **Validity** measures whether the outcome of the research questions results in the manner they were aimed for. Validity can be difficult to measure. All interpretations must arise from the collected data. Focus groups appear to have high validity because the method is readily understood and findings appear believable (Preece, 2002). My role as facilitator could affect the validity because I am not a professional. However, the received data followed my assumptions in a satisfying way for my research.

The developed concept for a mobile TV program format is a result based upon my findings and readings. Therefore, validity should be considered as high.
3.9 Summary

The outcome of the different methods is dependent on the human factor, which could affect the results differently depending on the investigator. Selection of methods and participants is individual, which could also affect the result. Different methods and participants could generate different ideas. However, the selection of participants in this study is to guarantee reliability and validity. Using different research methods and interviewing experts from different areas is a way to reduce biases. Results are presented in chapter four.
4. Results

The result chapter presents findings from user researches and exploratory interviews with experts. This is a description over tendencies for a future mobile TV service according to users and experts.

4.1 Survey questionnaire - wide data input

4.1.1 General data

![Diagram 4. Most frequent time to watch linear television was between 6pm and 10pm.](image)

Participants’ television habits showed that the most popular time to watch television was between 6pm and 10pm. It is most likely that people watch television when they are at home and not at work. Another reason could be the lack of interesting television shows during daytime. 60% of the respondents said they watched television for two to three hours per day and 32% said they watch television for up to one hour per day. One person watched television between four to five hours per day.

The results from personal comments showed that there is a wish to be able to watch television at places and times when a television set is normally not available. Personal comments displayed that sports events, and to watch television while traveling, was most desirable. 36% said they had no need in watching television at other times and places that they normally do today.
4.1.2 Mobile usage

Diagram 5. Most popular ways to share content between friends were by far SMS, followed by MMS and Bluetooth. Content to share was often personal made content such as, photos, old SMS, but also music.

A majority of the mobile users share their personal content on their mobile phones with others. SMS is the most popular technique to use for sharing content followed by MMS and Bluetooth. The sharing of multimedia content indicates an interest of content involving multimedia elements such as pictures, sounds and video.

Diagram 6. Users show an interest of watching motion picture in the mobile phone. Most popular content were news, music and sports. However, there are some who do not want to watch motion pictures in their mobile phones.

Other types of content respondents found interesting to watch were movies and popular television series such as; Lost, 24, Desperate Housewives etc. However, 24% of respondents said they were not interesting in watching television on their mobiles. One reason mentioned to that was the problem of watching on a small screen.
Results show that most users can access built in mobile applications and services. A majority of respondents said they used the mobile phone for entertainment. Among the personal comments it became clear that users mainly were taking photos with the built in digital camera, listening to music, reading old text messages, sending SMS and MMS, playing games with the mobile phone. The mobile phone could therefore be seen as a device aimed for entertainment as well as communication. However, as diagram 8 shows, built-in mobile services are not used very frequent.

Diagram 7. Most participants could access built in mobile application and services. Those who could not, showed an interest to get access to the different services.

Diagram 8. As showed on table 6, users have access to different mobile services and application. However, this table shows that the usage of the different services is very low.
Results

Those using mobile services said they preferred listening to music. Time spent on mobile services was between thirty seconds up to one hour per day, however, average time spent was between ten to fifteen minutes per day. Most of the respondents had access to different mobile services but did not use them.

The mobile phone was mainly used for relaxation and entertainment. According to personal comments, users were mainly: listening to music, playing games, taking photos, sending SMS and MMS, reading old SMS, capturing film, calling, and browsing the mobile to discover new services. Almost everyone in this study shared their personal content to others in some way. Popular techniques to share content were by SMS, MMS and Bluetooth.

4.1.3 Internet usage

![Diagram 9. Watching video clips on the Internet is very popular and a highly used service.](image)

Time watching video clips on the Internet was between thirty seconds up to three hours. Types of content to watch were: music, news, sport, television series and movies. Two respondents answered porn when asked what kind of content they watched. Two other said they watched “entertaining” content; one watched trailers and the other one watched content that was sent to respondent and thus did not actively search for content. Six respondents answered they watched other types of content. Television series were popular to download and watch afterwards. The most popular service used for watching video clips on the Internet was YouTube (76%).

4.1.4 Summary of results from the survey questionnaire

Traditional television is most often watched from 6pm to 2am. A majority of participants in this study showed an interest of watching mobile TV and popular content to watch were: news, sports, music, television series and movies were the most popular shows to watch. However, one quarter said they were not interested in watching television on the mobile phone, which hints that mobile TV might not fulfill user’s demands of a useful mobile service today.

The usage of mobile services and application such as listening to radio, music, playing games, sending MMS, watching video clips, brows the Internet, etc. were low in this study. More than half of respondents said they never used that type of service. The low usage is most probably due to the dissatisfying user experience for those built in mobile services since most respondent could access them. User preferred browsing the Internet or listen to music on other devices.
aimed for that purpose rather than doing it on the mobile phone. Computers and MP3 players provide a better user experiences and therefore are more often used for those purposes. It is interesting to compare mobile service usage to Internet service usage, and particular watching video clips. Watching video clips on the Internet was popular however; participants barely used that service on the mobile phone.

The low usage of built in mobile services and application are discussed later on in the focus groups.

4.2 Focus groups- a user perspective

Participants in the focus groups used different devices depending on their needs. They used MP3 players for listening to music and had a digital camera to take photos with. Most new mobile phones today have these services build-in; however, the users said they did not use those types of services as frequent. Users mentioned different problem areas with built-in services in the mobile phone such as; memory capacity, lack of full functionality, battery life, and the time it takes to start up the services. In general, users thought built-in mobile phone services were decent, but not satisfying enough to completely replace the digital camera or the MP3 player. Built-in mobile services must be as useful as the stand-alone device to be used in a mobile phone. Both groups considered complexity as one reason to why these kinds of services added on the mobile phone are used less frequently. One participant in the second focus group thought manufactures should develop more specific mobile phones with fewer and better applications instead of having several built-in services. Users believed fewer and better applications in the mobile phone would result in a more frequent usage of built-in mobile services. A mobile TV service that can attract several users was considered as a useful service.

4.2.1 Quality aspects

The Quality of Service (QoS) was considered as an important issue regarding users willingness to watch motion picture content on a mobile phone. The picture quality was important. Students mentioned low-resolution content and interruptions as negative factors when watching motion pictures on a mobile phone. A high quality mobile TV service also increases users willingness to pay for using the service. When the picture quality is acceptable, students thought the mobile TV usage would increase.

The video content showed on the iPod Video had positive user reactions. Both focus groups agreed that a mobile TV service with the same quality as the iPod video is sufficient for encouraging the watching of motion pictures on a small screen. Before content was shown on the iPod, users were skeptical of watching motion pictures on a small screen. After the demonstration, users opinion changed and became positive regarding viewing of motion pictures on a small screen.

4.2.2 Usability issues

Installations programs for mobile services could in many cases be difficult to find and install. After completed installations the service must work without problems. MMS installations configurations were mentioned by both focus groups as a bad example of usability when the configuration data is downloaded to the mobile phone without results.

Interaction design must be simple and clear. Users were also asking for a specific TV button that takes the user straight to the mobile TV service. Time consumption elements such as searching and pressing buttons until content is reached might have the affect of losing the users interest of the service. Users from both focus groups mentioned that channel switching must have short delays.
4.2.3 Users want control

The student group was more interested in controlling the content they watch and when to watch it. The same group also asked for an alarm function that reminds, and, guides them directly to the start of their favorite program. Students also commented that services offering users valuable and unique information is a useful service. A useful and unique mobile TV services can be on-demand.

Both groups however thought a combination of on-demand and linear mobile TV services would be useful in a mobile context. Further on, sending content between friends while using the Internet could be used in a mobile context since it was considered as interesting and useful. Recommendations from friends were seen as an enjoyable way to discover new content. Users felt they had more trust in content recommended by their friends. Since searching for interesting content could be time consuming, the focus groups found this way of recommendations more effective.

4.2.4 Program format ideas

The main purpose with the two focus groups was to generate ideas of program formats for mobile TV. Both groups resulted in useful ideas and general thoughts of useful elements in a mobile TV services.

A brief summary of the discussed ideas will now follow, which shows what the users are asking for in a mobile TV program formats. Some of these ideas were further developed into different concepts, which were later presented to experts. The six concepts are further presented in chapter 4.2.5.

- *User generated traveling show*- Users generates motion picture content from different location. Tips and advice from different locations could guide new travelers through the city.
- *User generated sports show*- Relatives and friends track each athlete combining information and video content to the mobile.
- *User generated news show*- The idea is based on citizen journalism where the user becomes a newscaster by capturing video with the mobile video camera.
- *Sports high light show*- Summaries of sport games made for mobile TV.
- *Special “best of shows” for mobile TV regarding popular larger events*- Larger events could for example be: music festivals, sports tournaments or other events that attracts a big audience.
- *Nightclub TV*- Community service using motion pictures specially made for mobile TV.
- *Ski-resort TV*- Local program format with updated information regarding the ski-resort
- *Sea-weather reports*- Focused on niche areas of interest to support with motion picture content at places where traditional television is difficult to use.
- *Mobile soap operas*- Idea to encourage coworkers to socialize and talk about the content at workplaces.

4.2.5 General thoughts about Mobile TV program formats

Mobile TV can be used at locations where traditional television is not available. According to students, on-demand television was seen as the most attractive aspect for use in a mobile TV service since they are not interested to be ruled by scheduled television. However, there is still a need of watching programs live. Live television has a consumer value for those who need to get
instant information. The second focus group thought linear television was important to access in a mobile TV service since television according to them was instant.

Students mentioned that a mobile TV program format has to be relevant for many users. They also thought mobile TV would mainly be used during certain periods of time, when for example larger television events occur, and function as an extension to linear television. Students believe people over fifty are more interested in linear television while younger users are more interested in shorter video clips and content special aimed for the mobile phone. However, mobile TV sport events were thought to be interesting to watch; especially highlights of the event, since users thought there are people who are not interested in watching an entire game on a small screen. That type of service is believed to be useful for socializing at workplaces where games and highlights are most often discussed. One participant in the second focus group said a program format should preferably be built around social communication rather than information.

An extension to sports program format was to allow users to control special cameras during the game by using the mobile phone to track individual players. In addition, it could also be an interesting complement to the linear television. Interaction and affection of television content could according to students be interesting in a program format. As students mentioned, interaction is seen as important for mobile TV services but it has to be more than just voting by sending SMS. Users consider television interaction services as boring and useless due to low user values. Useful interaction services according to both focus groups could be for example, buying a concert ticket in connection to a television event or, instant dinner reservations for restaurants from the mobile phone. Interaction should also enable users to pay for the service with the mobile phone. Interaction cannot be forced since that could make users less interested in using the interaction service.

Commercials are often seen as irritating when shown at the beginning of content. Users ask for new ways to use motion picture commercials considering format and content. Commercials must be interesting to watch and suit consumer interests. Users believe interactive and personalized commercials could help consumers to faster deals.

Both focus groups believed user generated content could succeed in a mobile phone since it is successful on the Internet. They also agreed that content such as YouTube could work very well as a mobile TV service. That type of mobile TV service was something they would use for killing time.

Length of content is crucial since time for watching motion pictures on a mobile phone tend to be short. Therefore, mobile TV program formats have to be developed with that in mind. High light television or “best of shows” could therefore be useful program formats for mobile TV. The results from the user research displays mainly that quality, usability and control aspects are all important issues in a mobile TV program format. A future program format should be developed from those conditions.

4.2.6 Concepts

From the user research, six different concepts were developed and later discussed with expertise. Upcoming ideas from the first focus group were also discussed with the second focus group.

WikiResia

This concept is a user generated traveling show where users add motion picture content from different places and situations in Sweden. Content can consist of tips on pleasant restaurants, beautiful beaches or other things in which of users feel are worth reporting. An alternative could be to use produced content from a television station or production company. By using GPS, user’s location can be decided and depending on position and place, the user can either add new material to the service or display what other users have reported from that specific place.
The recommendations added by users could work as a position based motion picture guidebook for tourists in a mobile format.

Users should have the opportunity to grade uploaded content to easier segment out interesting and useful content. Rated content by users is both a popular and useful service on the Internet. Other users opinion regarding a service is often considered as trustworthy and helpful when the users are in position to make a decision. Categories of interest in this idea could for example be: hotel bookings, restaurants, car rental firms etc.

This idea encourages users to makes personal television shows, which potentially could be used in a traditional television show.

The service must be easy to use. Video clips are easily sent as recommendations to friends. The service could involve a smaller financial compensation for the producer of content when someone watches it.

Users can chose to only be displayed to content within a certain area of interest or just browsing the service for specific content.

Due to the high roaming costs outside Sweden, this idea was considered better if kept nationally. It is also a service that helps users on the move. It is a motion picture guidebook based on position and user generated content.

Åre TV- a local TV station

Åre ski resort is one of the largest and most popular ski resorts in Sweden. There is already an existing local television station in the village that function as an informational channel for tourists and the local population. Television contents shown are news, happenings in the village, weather reports, ski reports and local commercials.

Skiers spend a lot of time in ski lifts and in queues. Updated weather reports could in some cases be crucial since weather changes rapidly in the mountains.

This idea grew from giving users a local mobile TV channel that gives updated information about the resort, for example: news, weather, entertainment, ski reports, restaurants etc. as well as global news. Television commercials shall involve interactive elements to enable user to, for example, make reservations at restaurants while a commercial for that restaurant is shown. Tips for the night’s events can be a service included and let the user buy tickets to concerts or entrance fees to nightclubs from the mobile phone. All reservations and tickets are electronically and received in the mobile phone. By using this service, discounts at restaurants and bars can be received.

This idea is linked to a specific place, in this case, a ski resort. Skiers are known to be ahead when it comes to equipment and they are more likely individuals who have the money to spend. Users receive updated information specified for their situation and can be used when it suits the consumer best regarding time and place. The service can also be used for killing time in ski lifts or during a lunch break. This service opens up a new market for the local businesses and advertising.

There is already editorial staff in Åre producing television content, which could be adapted to a mobile TV program format.

Best of show

This is an idea based upon socializing. Larger live events such as sports, music or important news happenings, often attracts a large audience. Important television happenings are often a hot topic to discuss at the workplace since it has a social function. A problem however is that many people do not have the time, or a desire to spend several hours in front of a television set to be able to talk with the colleagues at work the next day.
Results

Making a “Best of show” specially made for mobile TV will not only save the user time, but also encourage discussions at work. To make the mobile TV programs more exclusive, unique material can be added as an extra feature.

Short-time programs suit the mobile user behavior better than longer and editorial material can easily be adjusted to suit the mobile platform.

Club TV

Club community sites on the Internet are very popular worldwide. Some people have a need to be seen by others at the “right” kind of clubs and bars. Club TV is a mobile community with motion pictures instead of still pictures as on the Internet. A camera team makes the short, special produced, mobile reports of what is going at different nightclubs and bars. Content shall be well produced and emit an ambience of the club to encourage people to attend. The service could for example also be suitable for killing time on the way to, or from a nightclub.

Live news portal

This idea grew from the idea of citizen journalism where people use the mobile video camera for news reporting. News media uses citizens more often today as a source when something happens. Users could sign up for a service that allows news stations to use GPS to locate a user when something newsworthy happens. A network with different users close to the news scene allows the news station to choose which user to use for reporting based on position. On the scene, the user signs up on the portal and starts capturing video with the mobile camera. The live content gets to the producer who can then decide what to do with the content. More than one user at the same scene enables the producer to switch between different mobile camera angels. This idea enables television stations to receive live motion picture content at a fast speed before a camera team gets to the place. Users signed up for the service are financial compensated. The service is based on GPS and video telephony.

Mobile soaps

This idea is to create short mobile TV series by using famous and popular actors. Talking television content with friends is seen as an important social factor for television services. Focus group two believed short mobile soap operas, using famous actors, could be a way to create social communication situations in the workplace. The problem may be finding a good story that attracts viewers, which is also true for conventional television.

4.3 Exploratory interviews

4.3.1 Transmission techniques

Johanna Johansson at the mobile operator Telenor, said Telenor are looking at two main issues for their mobile TV service: technique and content. On the technical side, 3G, MBMS and DVB-H are all interesting to use. Telenor are not only interested in linear television but thinks televisions communication models are useful and something Telenor are interesting to use for their mobile TV service. Today, 3G will most likely be the technique mobile TV will be transmitted through according to Slott. There is already an existing network that is not fully used. Laffan and Ljunggren have the same opinion about the 3G networks as Slott and says today’s bandwidth in the networks are well enough suited to transmit mobile TV. Werner has a different opinion regarding the 3G networks and does not think the 3G networks fulfill the quality aspects for Mobile TV today. Technology itself is not the most important issue to SVT. More importantly is to investigate the possibilities of what SVT can gain by using the mobile phone as a platform to transmit television content.
4.3.2 Pushed content

Pushed content was discussed with Anders Kälvemark at Ericsson and Per Werner at Teracom who both had a positive opinion towards that transmission technique. Pushed content was not technical feasible to use during the pilot study of DVB-H in Stockholm fall 2006, according to Werner. Pushed content to download can be used independently of 3G networks coverage since content gets stored in the device. This enables user to watch content without interruptions and failures due to insufficient network coverage. It is also possible for the user to pause and play content when traveling says Kälvemark. However pushed content comes with a downside and that is the memory capacity of the mobile phone. Pushed to download motion picture content has to be stored in the device once it is downloaded. Mobile phones have limitations in memory capacity, which can be a problem if too much content is downloaded. Kälvemark also says subscribed content must be easy to control to prevent the service from becoming a spam channel.

4.3.3 Combine two technologies for better Quality of Service

Brian Laffan at Tre focuses on the best transmission technique currently available, which is through the 3G networks. In the future, Laffan, Werner and Kälvemark believe a combination of broadcasting and streaming technologies will transmit mobile TV. Popular programs where numbers of viewers are high must be broadcast since streamed content is only able to handle a limited numbers of viewers simultaneously. Mobile TV content could therefore be both live and on-demand.

Johansson, Ljunggren and Slott, all mentioned geographical prerequisite with DVB-H as a problem. Places and situations where mobile TV could be interesting to use are places where network coverage has a tendency to be of lower quality of service. Examples mentioned were traveling by car and going through a tunnel or other places where signals have problems due to geographic. Werner agrees to Slott about the quality of service in the networks while traveling in the subway but he also says that DVB-H coverage fulfills users quality demands inside and outside houses. Kälvemark says Ericsson supports DVB-H but does not develop the technique. Teracom is not only looking at DVB-H as transmission technique. MBMS can be interesting to use but is more of a solution for mobile operator says Werner.

4.3.4 New frequencies, new possibilities

When the analogue television network is shut down in Sweden in January 31 2008, television frequencies will be available to use. However, those frequencies need permission for using according to Werner. Even though new frequencies get released, it is not yet decided what they should be used for according to Slott, Werner and Ljunggren. High Definition TV (HDTV) is another interesting area that needs frequencies to broadcast over. Great Britain is still using the analog network to broadcast television over and will do so till 2012. Russia uses the hypothetical mobile TV frequencies for military purposes and are most likely not willing to release their frequencies for mobile TV, says Slott.

The more business involved in mobile TV, the slower and more problematic the developing process becomes. Whether DVB-H will be used or not is at present a political issue rather then technical, according to Werner.

Ljunggren believes mobile TV should start up by using the existing 3G networks since no particular agreements are needed. Laffan discusses the same topic and says, there are several companies involved in mobile TV today and they all have to work towards the same goals to make it happen. Slott thought that if the set-free of frequencies takes to long time, the market might skip that alternative and venture another technology.
4.3.5 Power consumption
The major advantage of DVB-H is lower power consumption compared to streamed video since signals are sent in bursts. Longer intervals between the bursts result in lower power consumption, however this results in slower channel switching. A higher burst rate makes channel switching faster but result in higher power consumption according to Ljunggren. Ericsson found it very important to be able to deliver mobile terminals with longer battery life and less power consuming displays. Kälvemark described the battery life problem as accurate.

4.3.6 First round on-demand
Ljunggren and Kälvemark at Ericsson believe mobile TV will at first be on-demand to let the user decide when and what to watch on the mobile terminal. Content on-demand enables the user to pause programs, when for example going on and of busses. That function is also an important control aspect for the user. The technique supplying this today is Unicast.

“If the consumer wants on-demand there is no need of building a dedicated network for broadcasted mobile TV”

Lars Ljunggren, Ericsson

Alexander Knudtzon Alvevi and Sigrid Norman from the production company Talpa agrees with Ljunggren and says on-demand techniques are more interesting to use rather than a dedicated broadcast transmission system. Broadcast is only interesting to use for bigger television events.

4.3.7 Terminal capacity issues
According to Ljunggren, mobile terminal capacity issues will most likely be less complex in the future. However, users have to change and upgrade their mobile terminal to be able to use the new techniques according to Ljunggren, Knudtzon Alvevi and Norman. That will take time and it is therefore important to not hype mobile TV at the start-up phase. Knudtzon Alvevi, Norman and Ljunggren points out the importance of not launching a service to early since that will only result in dissatisfied consumers if the service does not run perfectly from the beginning.

4.3.8 When is broadcast the best solution?
Linear television is important for broadcasting live events such as, sports, news and other popular shows. Broadcast techniques are preferable for popular shows to prevent overload in the 3G networks when several users consume the same television channel. Ericsson is developing the technique MBMS, which enables popular television channels to broadcast television over the 3G networks. Software sensors viewing-rate for each and every channel per cell and automatically switch that channel from Unicast to broadcast. That means the system only has to use bandwidth when needed, which is cost-effective. MBMS is not in use today but will use the existing 3G networks and can be expanded by time and popularity of mobile TV by software upgrading, says Ljunggren. Ericsson does not believe in building a dedicated broadcast network for mobile TV since the market at present is fairly immature. However, when mobile TV increase in popularity and becomes a mass-market, a broadcast solution will be necessary when several people in the same area watch the same linear television channel at the same time. MBMS is mainly a mobile operator solution for mobile TV transmission, which Johansson confirms.

“MBMS is more interesting to use then DVB-H since it can be implemented direct in existing 3G networks”

Johanna Johansson, Telenor
In cities with high numbers of users, broadcast is the preferable alternative. Less populated areas can preferably use Unicast according to Ljunggren.

4.3.9 Killing-time, an economical issue

SVT supplies Sweden with public service broadcast television, which means, television does not have any commercial purposes. All programs showed are on a fixed budget. That means SVT has to deal with copyrights to show content on other platforms than traditional television. SVT use prime time to expose popular television shows to secure high numbers of viewers. Normal prime time is between 5pm to 10pm. Gunnar Slott describes the viewing habits of Mobile TV to be more of a killing-time behavior. Killing-time most often occurs at times outside regular television prime times. That time of the day is most often during office working hours, which is a time when linear television most often shows content with lower viewing rate. Mobile TV could result in a possibility that prime time moves due to other television routines.

However, content watched for killing-time is hard to measure and there are no guarantees that content will be watched. Mobile TV content is often watched for shorter periods of time. Moving money resources is risky and will affect the prime time viewers who have to watch lower budget content to compensate the budget. That is not a risk SVT is willing to take. There are no economical resources to broadcast an additional twenty hours a week, therefore, on-demand content is more interesting right now. Studies provided by Teracom shows that mobile TV is used at home and according to Slott, SVT is interesting to see if prime time television stretches out, when for example, watching television in bed, if it does, they have to re-prioritize prime-time content.

4.3.10 Mobile TV costs money, where are the revenues?

Laffan stated an important question: who will produce content for high light television? High light television is expensive and dominated by copyrights, and is therefore difficult to use. Knudtzon Alevi and Norman discuss the same issue and agree that special made mobile TV content is expensive to produce. Everyone has to understand that television productions cost and mobile operators do not make enough revenues to make it profitable. Swedish channel 5 loop their high light contents in the 3G networks, but only Swedish produced content is transmitted due to copyrights issues. Laffan says he would like to show other popular well-known television shows from outside Sweden but today, it will not increase profit. According to Laffan, it is a big risk to buy programs and broadcast them in the mobile networks. He continues to express a wish that someone takes that risk to see if it is profitable.

Mobile TV is dealing with low numbers of viewers, which affects advertising and revenues. A critical mass of viewers needs to be presented to sell advertising according to Johansson and Ljunggren. In that way, operators can afford popular programs made outside of Sweden and show them in the 3G networks. If that works out well, they might get revenues from charging the user for watching high light television shows.

4.3.11 Advertising

Advertising is an important revenue and have strengths when used in a mobile context since advertising can be personalized says Laffan. Lars Ljunggrens experience about users understanding for commercials is that content sent between friends are not seen as commercial since it is truster when you get content from someone you know. Targeted commercials are often seen as information rather than commercial and therefore more acceptable to be exposed to. The mobile benefits as a channel for commercials are the fact that it is possible to study the way commercials are used to better transmit personalized commercials. An issue according to Ljunggren is to find a reliable system to supply users with the “right” kind of commercial,
which will result in less expensive mobile services. The technology is available today, however, there are still legal issues of relevance to the use of commercials.

“What commercial has the user been exposed to? Show him another one.”

Brian Laffan

Mobile operator Tre is looking at different ways to expose commercials to the users and how users should interact. Not only commercials have an interaction interest, while watching television shows previous episodes could be able to purchase and access to while watching, according to Laffan.

Kälvemark say commercials have to be shown in a new way and format. Producers have to start thinking in a new way to fit commercials in to a mobile context. Traditional television is a passive way to consume content compared to mobile TV where the user is more active. The users can decide what, when and for how long content is watched. Johansson points out that in a mobile context, the user has a higher value for the operator since the mobile phone enables positioning of users and interacting with content. Telenor also uses other types of content, for example, music, to study how money and advertising are used. Johansson points out the importance to search for new revenue streams such as music concerts and music videos for mobile phones.

4.3.12 Old business models

Johansson and Kälvemark consider the business models used by content suppliers, based on payment of content, as outdated. Those models do not suit mobile operators today, partly because costs are too high, but also since that model is not established in the mobile business world.

Johansson made a comparison to traditional television, where the business model is well established. It is easier to get revenues from advertising since there are figures and numbers of when people watch television and what they watch.

Revenues are important, but to get high viewing rates, distributing of content has to be effective. Word of mouth is often used on the Internet and is considered as trustworthy and an effective marketing strategy according to Johansson and Kälvemark. Revenues from pushed content were discussed by Kälvemark who was looking forward to a business model to use for pricing content when using the 3G networks for transmitting content. According to Kälvemark, mobile TV faces a problem due to copyrights, prices and other laws that have to be solved before a successful service can be launched.

4.3.13 Content

A broadcast mobile TV channel according to SVT could work as a rerun channel like SVT24. Both SVT and Tre find it important to create unique content for the platform to make mobile TV more than what regular television can offer. Laffan says it is important to look at the qualities that make the mobile phone unique and to develop mobile TV services from that. Johansson made a comparison to the Internet where the content market quote is getting full. Users have made sophisticated decisions over what type of content they appreciate or not. That makes it, according to Johansson, more important to produce content with a user value.

Users are not as easy to entertain. A result from that could be the big expansion of user-generated content where users have a chance to create content and show others, says Johansson. One example of a successful user-generated service according to Johansson is “Yellow Arrows”, first started in New York City and has grown to a world phenomenon. Knudtzon Alevi and Norrman agree and say user-generated content is interesting when there are much content and tips available. If there is an existing base to start from it is easier to get users to post
materials of their own. Branding is therefore very important. Question raised was how to ignite a spark in someone to make him or her start using a service without having to spend a lot of money?

Production costs could be reduced if user generated content is used. Popular format mentioned was YouTube and similar content. To encourage users to post content, an award system would be interesting to use says Laffan. User generated content is interesting but it could also come with a downside. To assure that no illicit material gets available to users content has to be controlled. According to Slott, that demands some serious research to secure both quality and content. Slotts continuous and say there is always a risk that content can be affected by organizations for advertising purposes. That fact is another reason why user generated content needs to be secured before shown on mobile TV. Slott conclude and say that user generated content is not always a way to reduce costs. However, interesting and useful content can work as a base for a full-length show made for mobiles. What makes the mobile phone unique and what are the strengths? In the development process of a mobile TV service, Laffan and Kälvemark believe in working with the mobile characteristics to create unique content.

4.3.14 Program format

Laffan says 3 want a large variety of television content for the mobile platform. Johansson expressed a problem with program formats. It is hard to find a format that attracts a big audience. Kälvemark said mobile content has to come with a higher value then what regular television can provide to attract viewers. According to Slott and Laffan, content for the mobile should be based on what people like to watch on regular television, which means, the same content broadcasted on television to be showed on mobile TV. Johansson disagree to Slott and Laffan and thinks people are not as interested in watching established regular television shows on a mobile device because television as a medium is too rooted in people’s minds. Kälvemark was also doubtful if people in five years really want to watch the same content as everyone else at the same time. On-demand programs from the television world could work as recognition in the start-up and be used when it suits the consumer best says Kälvemark.

Today, Tre run a mobile TV service where Swedish channel 4 makes special news program showed live. The other channels included in the service are the same that broadcasts for regular television. The mobile operator Tre does not have resources to make any content of their own. Therefore, they tap signals from existing regular television stations and stream them in their networks. In the future, both Telenor and Tre expect to have a channel of their own. Johansson was hoping for mobile TV channels in the future to be just like a regular television channel.

Special made mobile program formats should have a consumer value for using it according to Tre while Telenor says it is a tough challenge to find broad formats that always feels fresh and new. Laffan believes mobile TV programs have to have high quality considering idea, format and content to become popular and interesting to watch. Studies show, the average time for watching mobile TV is between fifteen to thirty minutes per day. In the report “the journey continues” by Kälvemark, he express that viewing time is affected by availability of interesting content and time to watch (Kälvemark 2007). However, Laffan says it will be hard to have programs showed continuously if the time length is short. That means more programs have to be produced, which is expensive.

4.3.15 What are the consumers asking for?

Different formats were discussed during interviews. User generated content seems to be the most popular to be used in a mobile TV service. Content with a local approach is also interesting and a way for local advertisers to be viewed in a mobile TV context. Johansson had an idea to cooperate with content suppliers for bigger events, for example, UEFA, who can supply operators with exclusive special made material for the mobile. It could also be a good idea to create a “must have” feeling in the service to make the consumer want to use the service and gain access to exclusive content. Social aspects, considering discussions about television
shows at work, are important functions at many Swedish workplaces today. Exclusive mobile TV material can create an advantage for those using the service according to Johansson. Bigger television events are in many ways desirable to show on other platforms, however, someone has to access licenses to get the legal rights to show the events. Johansson says it could be confusing for the consumer if same content are available on different platforms with different brands. Recognition is important for user to start using a service and therefore, Telenor believe it is more important to start working from an existing user behavior rather then trying to create a new one.

4.3.16 User aspects
To understand the way users consume mobile services are very important. Laffan describes the initial launch of new mobile TV services to be a stand-alone service to help users recognize themselves in the mobile environment. Too much new user behaviors and formats can confuse the users. The service must be easy to use from the beginning and have recognizable television elements within it to give the user a feeling of control over the media. Well-known television channels could work as an introduction to new special made mobile channels. New channels will be put next, or close to, well-known channels to give the user an opportunity to discover those channels. Werner also states the importance of recognizable elements within the service and that platforms and applications are consistence.

4.3.17 Understanding the user situation
Users are known from the Internet and television to search for information and decide what content to use. It is also important to make the consumer feel they are a part of the content and have the control over the result. If adopted on a mobile TV service that could result in higher valued services says Johansson. Users often have established a strong personal relation towards their mobile phones, which makes the user control aspect even more important according to Kälvemark. He also states the importance of understanding the television context well and how regular television is used to be able to understand the user’s needs and develop a service according to that. Another issue is to understand the actual user situation. Where will mobile TV be used? The user environment could affect the quality of light and sound of content says Kälvemark and continues. It is important to have a good understanding of mobile TV prerequisites and how mobile TV is used. The actual user situation affect content but also functions in the service as possibilities to pause, rewind, stop and play content.

4.3.18 Thoughts to have in mind
From a user perspective it is important to establish communication between consumer and content. Kälvemark says mobile services have to be easier to use than today. Johansson says mobile TV should be seen as a consumer service where no extra settings need to be made to get the service running. The problem however is to supply consumers with new mobile phones that fulfills user’s quality demands for content. Another issue is to minimize the risk of “bugs” in new mobile phones to satisfy consumers’ willingness to use the mobile and services according to Johansson. The technique has to work perfectly to secure consumers satisfaction and loyalty for a service, says Ljunggren. The same issues foresee Knudtzon Alevi and Normman who agree that technical aspects are important and make a difference. That includes mobile settings before using a service and how well a service runs while using it. A service must work from the beginning to be interesting to use. The easier a service is to use the better. Simplicity and user-friendly menus are important and Knudtzon Alevi and Normman continue and wish for a TV-button or a simple choice from the mobile start-up menu that takes the user direct to television content. It is also useful if a service has the same user interface independently of what mobile operator the service runs on. Kälvemark stated the importance of simplifying mobile services to conform the consumer and continues. Mobile TV should work spontaneously which means the
service needs a high respondent function to maintain a smooth viewing situation for the consumer.

4.3.19 New technology takes time to implement

Mobile TV could easily be hyped. According to Ljunggren, it is important not to launch a service too early because that could build up too high expectations towards the consumers. It takes time for new technology to establish a stable market. The risk of flash backs, due to hype, are also higher if a service is launched too early. A new service has to live up to the expectations or else, it will have a negative affect towards the consumers. That could have the effect of slowing down the process of getting new technology to the market and where potential consumers reject the new technology. Another challenge according to Ljunggren is the fact that watching television in a mobile phone is not rooted in peoples mind. It is a new user behavior and differs from what people are used to. It is not easy to change peoples behavior quickly. At Telenor, Johansson says it is important to start up using existing user-behaviors rather than trying to create new ones. Another issue is the time when people normally watch television. People tend to watch television in the evenings, which could make it difficult to get people to use their mobile TV at times they normally do not watch television. Ljunggren stated that those aspects are more important for elderly users and continues; In the future, it will be more important to focus on the younger generations who use new media and technology in a complete different way then elderly generations.

“To focus on users are more important then technology, which is something the industry most often misses out”

Lars Ljunggren 2007

There has to be driving forces to use a service that last for a longer period of time. If not, there might be a risk that services will fade away and in the end not be used at all says Kälvemark. The picture quality mobile TV is transmitted with today is not satisfying enough, according to Kälvemark. A service that cannot fulfill user’s quality demands creates dissatisfied customers due to user’s high expectations of the service. It is therefore important to go slow from the beginning until the service works without remarks. Kälvemark says mobile TV will be a successful service if it gets developed based on end users conditions. Werner agrees to Kälvemark and mentions radio as an important mobile service. Both television and radio are dependent on sound with high quality of service. Radio use both broadcast and 3G as transmission techniques and therefore, radio sound issues could be comparable to broadcast television sound issues.

4.4 Final concept- Event TV

Event TV is developed from the idea of television shows with a local approach. This idea has also elements from some of the six developed concepts from the focus groups. By discussing the different concepts with experts, the decision was made to focus on building a program format specific to larger events. The decision was grounded from a combination of what I found interesting to further develop and what the experts’ thought could work as an interesting future mobile TV program format.

Larger events are popular and attract many people from specific target groups. Events are also interesting to follow live on television and discuss later with friends. This idea is to offer users a way to use mobile TV as an interesting and unique information source for the local event. The mobile TV service gives the user a chance to share user generated content, watch live produced content, get information from local advertisers, and get updated information about the event.
The aims are to offer the audience a way to get exclusive information from the event through mobile TV and to offer advertisers a way to reach a target group with specific interests.

The concept differentiates itself from other media due to its local approach aimed for a specific target group. Content is designed to satisfy the audience the best way possible and offer unique material and services that are not in first hand available through other media.

The user situation is most probably connected to places where television access could be difficult. It is also places where updated and unique material could work as a personal status service for users who wants unique and updated information fast. Many people have a need to be a part of social discussions around bigger events. This idea not only enables users to discuss the content with friends, it also makes users become a part of the show.

A future mobile TV service consists preferably of a combination of on-demand and broadcast to give the user the freedom to decide what to watch and when. Broadcast content consists of the channels available in the terrestrial television networks, which fulfills users demands of watching familiar content too.

Program format is designed to suit the user situation best considering time spent watching, environment, content, service and interaction design. The concept have elements of user-generated content, live content, highlight content, updated local information and professionally produced content.

The final concept is a way to visualize the results from the study as an actual program format for mobile TV. The prototype and scenarios show the program formats functions in different users situations. This idea is however just one way to use the results from this study. The concept is thought to be able to use as a guide to program format and can be used on different areas and events than mentioned in this thesis.

Music festivals, sports, and other events that attract a specific audience have inspired the idea.

### 4.4.2 Scenarios

**Holiday at the ski resort**

Magnus, Ola and Mikael are old friends who all just turned twenty-seven. They grew up in the same neighborhood in a suburb to Stockholm. They also went to school together. April every year, they take a week off to go skiing. This year’s choice was Åre ski resort in Sweden. Mikael, who always has the latest equipments, is interesting in the mobile TV service Åre provides their visitors.

It is 10.15am and the three friends are together on the ski lift to the top. The weather conditions are not perfect and Mikael decide to watch the latest weather report, on-demand, on his mobile. Weather will get better after lunch, says Mikael. At the end of the weather report Mikael gets an instant message offer for a lunch discount at one of the restaurants in the village so they all agree to go there for lunch.

1pm, lunchtime. After three hours of skiing, the hunger sets in, so they ski to the lunch restaurant that gave Mikael a discount coupon. Once there, Mikael shows the cashier the discount coupon he received to his mobile phone. The lunch is delightful and pleasant. Mikael is browsing through the television service and find different home made ski-videos from today, which they watch while waiting for the waitress to bring the check. A video inspires them with two people skiing down a piste in the area, so they decide to try that area after the lunch.

2.30pm. Once there, the sun is shining and the sky is blue. Snow conditions looks good too, but to be sure, Mikael looks at the latest avalanche report on his mobile phone. Conditions are perfect. They find a nice jump where they start performing advanced jumps. Mikael records the jump session with his mobile video camera and post it on the mobile TV service.
5pm. After a long day at the slopes, the guys are back at the cottage. Mikael is sitting on the coach watching the live local television show on his mobile phone. All of a sudden, he sees his friends jump session and gets excited about it. Mikael’s video clip was one of the top-ten most watched during the day and was therefore shown on the local television show.

5.15pm. During the commercials, Mikael gets a request if he wants to book a table at a restaurant nearby. He makes a reservation for three at the 8 pm sitting and receives the confirmation instantly on his mobile phone.

9.50pm. Food was excellent and Ola and Magnus feel like going to a nightclub, since it is Saturday night. Mikael zaps between the channels and find the live camera for the nightclubs. “It starting to get crowded,” says Mikael. He shows his friends the view from the nightclub and they all agree that it looks like a fun place to be.

10.15pm. The three friends take a taxi to the nightclub were they have a great time together.

The music festival

John and Jockum are twenty-three years old, studying economics at Uppsala University in Sweden. They are both single and enjoy listening to music, and going to clubs and bars. Johan grew up in Stockholm and Jockum is originally from Örebro. They met each other while studying at the Uppsala University and have then been friends, knowing each other about two years now. This summer, they decided to go to Hultsfred Music Festival along with some other friends. John and Jockum’s friends arrived earlier then they but staying in different areas of the camp, for the duration of the week.

They are both average mobile users and have the Sony Ericsson K800i mobile phone. They enjoy listening to music on their mobile phones because it is convenient. This year festival will be special because Hultsfred is launching their new mobile TV application. Anyone who is interested in the festival can download the application to his or her mobile phones from the festivals mobile web site. John and Jockum and all their friends have already downloaded the application to their mobile phones and are excited to start using it. The Hultsfred Festival mobile TV application is an extension to the broadcast television service and involves user-generated-, on-demand, and podcasting content. These different services enable user’s flexibility and control of content.

The application start menu

MeTv- is a user-generated service that allows festival visitors to post their own clips from the festival as well as watching video clips from visitors at Hultsfred. Users can rate video clips within the MeTv service and the 5 top rated clips are displayed on a list. All video clips from the festival can be watched outside the festival area. However, festival visitors can only upload clips with the personalized code on the festival bracelet.

On-demand- Everyone who has access to the on-demand application can watch live produced television content after it is broadcasted. The content is streamed over the 3G networks, which makes it dependent on the number of simultaneously users
and the network coverage. Users can access updated information without being dependent on time schedules for the program. Users can pause and play content at their own wish. The on-demand service enables users to control when and what content to watch. This also enables users to watch programs spontaneously. However, since network coverage can differ, and the service is dependent on the number of users, on-demand is preferably used for shorter clips, and content that is not dependent on the highest picture quality.

**Pod** is a subscription service in which users are able to make active selections of content to view from a personal interest. Since the contents are downloaded to the mobile phone, the service is less dependent on network coverage while viewing the program. The picture quality can be high because the content are saved directly on the device and not live streamed as with on-demand. The programs may be longer, however, content with longer duration time demands higher memory capacity in the mobile phone. Time duration also affects battery life. Pod content is a subscription service in which the user is able to see the available programs in and subscribe to them in advance. After that content has been shown or produced, it becomes available within the Pod service.

**LiveTV** - this service shows traditional broadcast television and content special made for the event. The special made content is also locally broadcasted to the specific area. The service has an interactive TV-Guide where users can access other channels instantly and add reminders for programs which to be watched in the future.

**7pm.** When John first entered the festival, he adds a reminder for the Hultsfred Festival News show. John is sitting outside his tent when a beeping signal from his mobile phone catches his attention. The beeping signal is a reminder of the news-show that begins at 7pm. He takes his mobile phone out of his pocket and presses the “YES” soft key. By doing that, he gets to the special made live broadcast news show. The Festival News is locally broadcasted for the Hultsfred festival. When the live show is over, the same content is available on-demand for everyone with the application installed on the mobile phone. John likes what he sees. The news-show provides him with updated information about events at the festival. Besides the local broadcast show, John can also access his traditional television stations. At the end of the show, a local weather forecast is shown. Unfortunately, the weather does not look good for the evening. Before John and his friends leave to see the “the Hives” concert, he reminds them of the forecasted rain showers and they all bring their raincoats.
3.15am. John is back at the camp again and sits inside the tent. He plays with his mobile and enters MeTV on the Hultsfred Festival application. MeTV is a special user generated service for the festival. Each festival visitor has a five-digit number on the festival bracelet that serves as identification when clips are uploaded to the application. John enters the application and sees that his friend Eric has posted a video that has made it to the top-five chart for most watched video clips. To upload a video clip on MeTV, Eric had to click on the upload button to get to the page where he can choose the clip he wants to upload.

John watches the clip and the following short personalized commercial. The commercial is an offer to buy the latest “the Hives” ring tone to the mobile phone. However, John decides not to buy the ring tone and he automatically transfers to the start menu for MeTV. While there, Eric’s video clip is still in the preview window and John decides to send a link of the clip to their mutual friend, Niklas, who could not make it to the festival this year. Before he sends the clip to Niklas, he rates it, five stars!!!

When the video clip is ended, a short personalized commercial is shown. The user has the ability to interact with the commercial. In this case, John gets an offer to buy a ring tone from “the Hives”. John can also recommend the commercial to a friend. After the commercial the user gets returned to start menu for MeTV where he can rate the clip, in this case, “Flying”. He can also send it to a friend, search for clips or, if the user is a festival visitor, post own material.
**8.20 am.** Jockum wakes up early the next morning. He finds his mobile phone and starts reading received text messages. When he is done reading, he enters the Hultsfred Festival application where he can see three new podcasts that have been received to his mobile phone during the night. He decides to watch the highlights from the Marit Bergman concert he could not attend the night before. He rests his head on the pillow and enjoys Marit Bergman concert.

**Jockum has three new unwatched podcastings, which the icon indicates with the number three. Also, unwatched podcasts have blue text instead of black. Content is organized in categories and date. New clips are placed at the top of its category. Users can send RSS links between each other. Subscriptions starts and ends under “Subscriptions” in the “More” menu.**

**10.30am.** John is now awake and watches the news on one of the broadcast television channels on his mobile phone. He zaps through the other channels when the news is over. He stops on a live camera showing the camp where Jockum and his friends are staying. He activates the camera controller and directs the camera with his mobile phone to the place where his friends stays. He can see that they are also awake and eating breakfast outside their tent. John, who is getting hungry, decides to go over and have breakfast with them.

**Live broadcast television. John takes control of the camera and directs it with his mobile phone.**
12.45pm. Niklas, who is back home in Stockholm working, takes a few minutes of his lunch break to watch the “best of summary” of yesterday’s festival. He enters the application and chooses on-demand, where he finds the “best of summary” and starts watching it. With this program, Niklas can dream of being at the festival with his friends and promise himself to join them next year.

Users decides what content to watch and when. Since programs are streamed to the mobile phone over the 3G networks they become dependent on network coverage. The advantage with on-demand is that produced content is available after shown on broadcast television. By showing the same content on demand is a useful service for users who do not wants to be ruled by scheduled television. As with the podcast example, video clips are direct shown on full screen.

The Event application is a framework to be used for bigger events such as: Festivals, Båstad Open, Åre ski-resort, Gotland summer parties etc.

4.5 Summary

Mobile TV users need to provide more than linear television to be interesting to use according to users. A mobile TV program format that comes with a user value is also more interesting for future usage. Expertise claims mobile TV is more than getting motion pictures to the mobile phone since there are still problems regarding business models, politics, legal issues and technology. Before mobile TV can become the success the business wish for, these issues have to be solved.

Data from users and experts resulted in a concept of a future mobile TV program format. Event-TV is an innovative service developed to fulfill both users and experts regarding business aspects, program format and user situation.
5. Analysis

This chapter gives an analysis of results from the user research and exploratory interviews.

5.1 Motion pictures to the mobile phone

What will make consumers watch television on the mobile phone when results from the survey questionnaire and the focus groups show that television is normally watched at home and at spare time? I believe mobile TV will not replace the television, but it will complement it. Watching television on the mobile phone could be unneeded if there is no user value. Mobile TV enables users to watch television content most time of the day. However, if mobile TV consist of only traditional linear television content, I believe time for watching will be adjusted to prime-time hours due to lack of high light television content during the day. Watching television on the mobile phone will therefore not be spread out during the day.

As pilot tests on mobile TV shows, users tend to watch mobile TV at home. That is most probably due to lack of content outside prime-time and that traditional television is normally used at home. Televisions schedules are rooted in user’s minds and could therefore affect the way users use mobile TV. My belief is that mobile TV must differ itself from traditional television to become successful and be built around the strength of the mobile phone. Program formats have to offer consumers a better and more useful television experience than traditional television do today to become an interesting mobile service.

Using on-demand content or program formats developed to be used at other times than prime-time will probably make mobile TV become a killing-time service. Those services are not dependent on television schedules, which simplify the usage of content.

Television is a social activity both during and after television shows. However, watching television at home is changing due to new possibilities to watch content at other times and places due to the Internet. Mobile TV can encourage social activities at, for example, workplaces. Mobile TV program formats are preferably designed to encourage social activity at workplaces or between friends. I believe the developed program format can encourage users to use mobile TV at other times of the day then when traditional scheduled television is shown.

What type of program formats suits mobile TV? To start with, both users and expertise agree that a mobile TV service must consist of a combination of broadcast television and on-demand programs. I think a combination opens up new possibilities for program formats and mobile TV services. Broadcast mobile TV basically consists of the same content as shown on television. Therefore, I believe broadcast mobile TV must be transmitted with a picture and sound quality that satisfies user as much as traditional television do to not disappoint the consumers. On-demand television is preferably used as an additional service and should be suited for the mobile phone. As the survey questionnaire results show, users are most interested in watching news, music and sports content on a mobile TV service. The developed program format use linear television to encourage and introduce users to the service. On-demand services are used to let users be in control of what content to watch and when.

User-generated content was desirable to use but contradicts to the fact that users wants high quality mobile TV. User generated content is often considered as low quality content. That means the user-generated content has a high value for the consumer. The fact that user generated content is free to use and produce can also encourage the usage of that type of service. In time mobile phones will most probably be more technical advanced, which could result in higher quality user generated content.
One interesting finding from the questionnaire was the very low usage of watching video content on the mobile phone while the same type of service was very frequent used on the Internet. Video content on the Internet is most often transmitted over a broadband network, which uses higher transmission capacity than the 3G networks. Watching video content on the mobile phone can therefore occur problematic. The developed program format concept is based on user’s thoughts and ideas and could affect the usage of mobile services positive. According to the focus groups, a useful mobile TV service must have a user value in both content and program format with a satisfying picture quality. As mentioned before, low quality content such as user-generated content, tend to have a high user value. Low quality content could therefore be interesting too if the service comes with a user value.

Depending on mobile TV services and program formats, different transmission techniques can be used. From a user perspective, transmission techniques are unimportant as long as the QoS is satisfying for watching motion pictures on a mobile phone. From a business perspective, dedicated broadcast transmission techniques are a problem concerning more than the telecom industry. Those problems could slow down the development of broadcasted mobile TV to reach a mass market. Using the 3G networks would most likely result in content similar to Internet. Recognizable elements from television, Internet and the mobile phone are, according to both users and expertise, important to have in mind when new mobile TV program formats are developed.

5.2 Business aspects

According to Brian Laffan at the mobile operator 3, it is important to understand that mobile TV content is expensive to produce. How does that affect the program format?

The developed concept is a combination of broadcast television, on-demand, user-generated and pushed to download content. User generated content is interesting to use in a mobile phone, according to users. YouTube was often mentioned as a desirable service for the mobile phone. From a business aspect, user generated content is free to produce and have a high user value. High user value for mobile services is considered as important according to users in this study. The user-generated elements in this concept are to encourage consumers to be more active. It also encourages users to share content between friends, which is known as an effective way to distribute content through on the Internet, according to both users and expertise.

Broadcast, on-demand and pushed to download content cost money to produce. However, consumers or advertisements could compensate that cost. But are users willing to pay for using a mobile TV service? One participant from the second focus group comment on the podcast material:

“A mobile TV service with quality comparable to the podcast material is enough satisfying to pay for.”

Male, thirty-two years old

Users appear more willing to pay for a service if content can be viewed with a satisfying picture quality. A high quality mobile TV service with a user value is probably also frequent used and could be charged for.

Advertising will most likely be a more central issue in future mobile TV services. Advertising is not only important for the mobile operators but also for the user since advertising will reduce the cost for the service. This concept uses interactive and personalized advertising. Interaction allows the user to achieve something with the commercials. In this concept, user can for example make restaurant reservations, book concert tickets or buy music videos with their mobile phones. Users are also able to pay direct with the mobile phones. From a business aspect, more potential purchases can be arranged. Personalized content are considered as valuable information rather than commercials, which also affects consumers’ opinion towards
Analysis

commercials in a positive way. However, the mobile phone is a very personal device and unwanted content could rapidly affect user’s opinion towards the service negatively. This thesis has not been investigating different advertising formats for mobile TV. However, I believe advertising will become more important for future mobile services in general since consumers care much about the costs for using a service. In my opinion, advertising must be innovative and be more of a functional user service rather than information. As well as mobile TV program formats must be developed using the strengths of the mobile phone, I believe the same is valid for mobile advertising.

Commercials must have a consumer value and be in a new way and format to be interesting to use. Commercials that are not understood as commercials and well produced could also work as entertainment. A successful commercial is well produced and does not look and feel like a commercial. If that could be done, commercials are more likely to get spread by word-of-mouth between friends and reach a larger mass. As mentioned before, recommendations from friends are seen as trustworthy and commercials distributed this way are more effective.

Revenues from advertisements are also important. More money will result in higher quality content and popular programs to show on mobile TV. Content with a local approach is interesting for example larger events or happenings connected to a city. That could be festivals, sports or music events etc. Local program shows opens up the market for local advertising and gives the citizens a local station for news and entertainment in a portable format. Commercials used in this program format are both interactive and personalized. Users are preferably awarded for watching commercials and commercials must be designed as a user service rather than information.

5.3 Mobile TV service

Users watch video content on the Internet but not on the mobile phone. Can a mobile TV service make users watch motion pictures on the mobile phone? I personally believe mobile TV can become a useful service if it is developed based on what users want to watch. The service must have a user value and be developed on the strength of the mobile phone to different itself from other media platforms. According to the two focus groups, the low usage of built in mobile services is due to dissatisfying user values. The developed program format is based on both users and expertise thoughts and is therefore more likely to be used. The low usage of built in mobile services could however affect the usage of a mobile TV service. Users in this study claimed that the built in mobile services did not fulfill their demands of a satisfying service. Developing a program format based on users and expertise’s interests will more likely result in a useful service.

Listening to music was the most popular service to use and reason behind that was convenience. Special designed music mobile phones have enabled users to use that service more than other built-in services. Could special made television mobile phones have the same effect? It is important according to Anders Kälvemark at Ericsson to understand that technologies take time to implement. Users need to upgrade their mobile phones, which takes time. Another factor is that mobile TV is not on peoples mind. People do not know the purpose of using a mobile TV service. To make people understand the usage of mobile TV slows down the implementation of mobile TV in Sweden. The usage of mobile TV is therefore dependent on the mobile TV service and the program format. If there are no interesting services or useful program formats, the user value of service will be low. Therefore, it is important to develop program formats based on user interest.

Where will mobile TV be used? Understanding the user and the user situation are important when new mobile TV services are developed. To know where mobile TV will be used, both environmental and by whom, will make the final program format more user friendly. A mobile TV service that is easy to use and have a high user value will most likely become a successful service.
5.4 The concept

The final concept is a combination of personal and experts thoughts and developed from the most interesting features from the first six concepts. Discussions with experts from different companies resulted in a concept connected to larger local events.

How do you get users interested in a new service and starts using it? The question is difficult to answer but there are some important thoughts to have in mind when a new program format is developed. Mobile TV program formats must be developed using the strength of the mobile phone as platform. That means content could preferably have elements from television, Internet and the mobile phone. The mobile phone is a communication device and this program format is developed to encourage communication between users with same interests.

This study shows result that users are interested in watching mobile TV for shorter periods of time than for example traditional television. Since both users and expertise said user generated content would be interesting to use in a mobile TV service, the final concept is developed to encourage users to produce content and recommend friends about interesting content. Recommendations are from a business aspect an effective distribution channel. From a user perspective, personal recommendations are seen as trustworthy. Since same actions can be displayed on the Internet today, it is likely the same behavior is also used in a mobile TV service.

The user situation is in this concept critical due to outdoor activities. Mobile phone displays are often sensitive to intense sunlight that could affect the user experience negative when used outdoor. The user situation is therefore important when new concepts are developed.

Laffan, Slott, Kälvemark and Johansson all had different opinions about program formats for mobile TV. Traditional television content is seen as interesting to watch in mobile TV, but there are of course other interesting program formats. How should a program format be developed to attract a big audience? Content shown on mobile TV should be based on what the users want. If users ask for traditional television, then that is what to be shown on mobile TV. However, mobile TV is probably watched for shorter periods of time than for example traditional television. The fact that traditional television programs are longer and scheduled might affect the user experience negative when watched on mobile TV. Another issue is that users do not know much about mobile TV. Mobile TV is often referred to as linear television to the mobile phone. Linear television is important since it enables new users to recognize themselves within the service. However, mobile TV can never be comparable to traditional television due to technical issues. Therefore, a mobile TV service must be something different from linear television but still with recognizable elements from television.

A combination of linear television and on-demand enables users flexibility over programs to watch and when. Recognizable elements from television help new users to start using the service. New channels put next to well-know channels can encourage new users to discover the service.

Building a program format based on larger events will automatically attract a large mass of potential viewers. If the program format as well as content is well produced, a mass market could easily be established. To reach a critical mass, advertising and recommendations are important. Interesting and useful content will get spread using word-of-mouth and the service would reach a larger mass of users.

The final concept in this thesis focuses on people with ages between eighteen and thirty-five. However, that age group could be considered as too old. A future mobile TV service should focus on a younger generation of users since they are the ones who will use the service in the future. Younger generations also use media and technology in a different ways, which could affect the way mobile TV is used in the future.
6. Conclusions

This chapter reflects the conclusions of the three main problems investigated in this thesis. This result is one solution of what a future mobile TV program format could be like.

Answer to what a future mobile TV program format is has more than one answer, however, results from this thesis show some tendencies of what users and stakeholders believe mobile TV will be like. Mobile TV is happening now. But to make it a useful and successful service some thoughts have to be in mind of those building the service.

6.1 What is a useful and interesting program format for mobile TV?

Users want control and mobile TV can fill the gap between traditional television and video content on the Internet. First, the mobile phone is a two-way communication device, which encourages interaction of content and more active users compared to traditional television. Second, mobile TV can be used at times and places where Internet or television cannot be used. Mobile TV is a combination of linear television, on-demand content and user-generated content. Future mobile TV program formats are therefore preferably developed from those facts.

A mobile TV service must have a consumer value and encourage users to active usage. Local, and niche programs, are interesting for both consumers and advertisers. Advertisers can in a more effective way locate users and expose them to advertising with personal interest and users can get updated with local information to instantly interact with. A useful and interesting program format is built on the strengths of the mobile phone. The mobile phone enables users to watch motion picture content independent of time and place. Mobile TV connected to larger local events enables users with a specific interest to use the mobile phones to get specific information.

The developed prototype in this thesis is a way to visualize how the results from this study can be used in an innovative way. Creating mobile TV programs around popular larger events for a specific target group, such as music-festival goers, could generate a positive and useful service for people with an interest for music. Further on, bigger events draw a large audience, which is important for advertising.

6.2 What types of content are interesting to watch on a mobile phone?

A new mobile service has to be developed in ensemble with the end user. However, this case shows there are more actors involved that have an important role if mobile TV shall become the successful service the mobile industry is hoping for. Considering mobile TV program formats and content, it is important for content providers and production companies to start thinking outside the box to create unique material for the consumer. Content needs to have special features that makes the program special and worth watching. The mobile TV usage is often for shorter periods of time, which will affect length of the program.

Users want high quality content to their mobile service but to a reasonable cost. That is a major problem since high quality services cost money to produce and to transmit. To be able to get high quality content to a mobile terminal, several actors need to adjust their services to the better. Users also need to upgrade their mobile phones to assimilate a better picture quality.
Content provider involved in mobile TV have to understand the new platform and create content that suits the user situation considering, time to watch, where to watch, and for how long. That process will probably take time and therefore most likely slow down the process of getting mobile TV to the mass market.

Users asked for a combination of traditional television and content on demand. News, sports and music were popular. This concept involves broadcast television content to enable users to watch well-known content. The on-demand function enables users to control the content to watch and when, which was seen as important. The combination between the two techniques enables content providers to develop more advanced and useful program formats. However, the most important factor when developing new program formats for mobile TV is to understand what content the end users are interesting in watching.

6.3 Is mobile TV linear television on a mobile phone or can it be something else?

Both users and experts are looking for a combination of on-demand and linear television to encourage the user to better decide what to watch and when. The way mobile TV transmits to the device is not of user’s interest. The importance is that the service runs well without interruptions on the mobile phone.

Problem today is that politicians have to agree to a set standard if broadcast over DVB-H are to be used. Mobile TV in Sweden will therefore continue as a service provided in the 3G networks and if the market increases, a dedicated mobile TV broadcast network can be implemented.

The telecom industry and operators have to unite and come up with a universal solution for business models and revenues. The old business models do not work for new mobile services were the consumers care less about who transmit content and care more about the communication between friends. Therefore, new business models have to be adapted to fulfill the consumers’ needs of using television content on the mobile phone and communication between friends, even though they are not using the same mobile operator. Mobile TV and other services could involve elements that encourage social interaction.
7. Discussion

This chapter discusses the thesis work and how the result can be used in the future. It also gives advice to further research that can be done in connection to this work.

This work has been to investigate mobile TV from a user- and expertise perspective. The methods chosen for data gathering are familiar methods to the author. That means it is easier to know every methods strengths and weaknesses. The methods also get more efficient since more precise data can be collected. The workflow has been smooth with no interruptions and results have not been affected by outside circumstances. Since the outcome result show tendencies of similar results from other studies, these results can be considered as trustworthy.

The final concept has not been tested on the target group for this study due to time-limitations for this project. User tests could result in re-design of the program format. Therefore, the final concept is better seen as a way to visualize the result from the user research rather then a fully developed program format for mobile TV.

The collected data could be considered as highly valuable and relevant for this kind of study. However, since the study is mostly qualitative, the result might differ depending on participators in the study. It is not sure that other studies might give exact the same results since it depends on the way questions are asked and who you ask.

The concept is based on the collected data and is a result of how to use the result in a mobile TV service. The future use of the concept is dependent on what happens in the telecom industry. As the result shows, there are many different aspects to consider when a new mobile TV service is developed. The concept can be seen as a framework to use for bigger events, like sports, music festivals, ski-resorts etc.

7.1 Discussion of concept

The idea is at some extend dependent on increasing capacity in the 3G networks. Further on, capacity in the mobile phones has to be improved regarding battery life and memory capacity. The idea is still in the concept mode, which makes it difficult to foresee the future use of the concept. If the service succeeds, the idea can be further developed into other concepts and used globally.

Obstacle is in first hand to reach a critical mass of users since that affect advertisers, and revenues. Legal rights of content are another critical point since music artist are dependent on revenues from own performances. The QoS is another obstacle. If content comes in a non-sufficient quality, users might reject the service. QoS is overall more important today since users are getting used to services with better quality. This concept must come in an enough satisfying overall QoS to satisfy the end users.
7.2 Further researches

Further research can preferably be done around the areas of business models for new mobile business. There is no existing model that can be used for operators to get revenues from mobile TV. If there is an effective solution to that problem it might help the mobile business industry to take off.

Another interesting area to investigate further on is how to make effective advertisement in a mobile TV service. In what format should advertising be presented in for mobile TV? Mobile TV differs from both linear television and Internet due to the small screen and the time spent watching content. Advertising however can use the strength of the mobile device with its two-way-communication. The advertising industry needs new ways and ideas of how to expose their consumers without interference.
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**Internet**

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SVT
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Telenor
[http://www.telenor.se](http://www.telenor.se)

Tre
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Teracom
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ENKÄT
Användarstudie om TV, Mobil och Internet

Hej och Tack för att Du tar dig tid!

Den här enkäten är en del av mitt examensarbete från Kungliga Tekniska Högskolan i Stockholm som syftar till att ta fram ett användarvänligt programformat för mobil TV. Arbetet utförs i samarbete med designbyråns Ocean Observations i Stockholm.

Enkäten är indelad i tre delar; TV, Mobil och Internet och tar ca 5-10 minuter att fylla i.

Eftersom just dina tankar och idéer är av stort intresse för min studie får du gärna lämna egna kommentarer vid frågorna.

David Saadat
Stockholm, mars 2007
Kön: □ MAN □ KVINNA

Ålder  Ringa in din ålder nedan

18-21  22-25  26-29  30-33  34-37  Annan___

Yrke/Sysselsättning

---

TV

1. Hur många timmar om dagen ser du på TV?
   Ringa in det alternativ som stämmer bäst in för dig.

0-1  2-3  4-5  6-7  mer än 8 timmar

2. Mellan vilka tider på dygnet ser du på TV?
   Ringa in det eller de klockslag som stämmer bäst för dig.

06-10  10-14  14-18  18-22  22-02  02-06

3. Har du upplevt tillfällen då du skulle ha velat se på TV men inte haft möjlighet till det?

JA □  NEJ □

Kommentera gärna vad det var för tillfällen nedan.
4. Om du kunde se på TV i mobilen, vilken typ av program skulle du vilja se då? Markera med ett kryss efter det/de eller det alternativ som stämmer bäst för dig.

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*Om du kryssat för annat, förklara gärna nedan vad du skulle vilja se för program.*
Mobil


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B. Ungefärlig surf-/wapptid vid varje tillfälle:


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B. Ungefärlig tid för tittande vid varje tillfälle:


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<thead>
<tr>
<th>Har möjlighet att</th>
<th>Har inte tillgång till tjänsten idag men <strong>VILL</strong> ha möjlighet att</th>
<th>Har inte tillgång till tjänsten idag och vill <strong>INTE</strong> ha möjlighet att</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lyssna på musik</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Spela spel</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Titta på videoklipp</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Surfa/wapp</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lyssna på radio</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fotografera</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Filma</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
11. Händer det att du använder mobilen som tidsfördriv?

JA ☐ NEJ ☐

*Kommentera gärna vad du gör då, ex. spela spel, wappa, sms:a, lyssna på musik, fotografera etc.*

12. A. Händer det att du delar med dig av ditt mobilinnehåll till andra?

JA ☐ NEJ ☐

B. Om JA, hur delar du med dig av innehållet? Markera med kryss efter det/de alternative som stämmer bäst in för dig.

| SMS |  |
| MMS |  |
| E-mail från mobilen |  |
| Överföring via dator |  |
| Visar live direkt från mobilen |  |
| Bluetooth |  |
| Infraröd delning (IR) |  |
| Annat | Fötydliga annat |

*Kommentera gärna vad du delar med dig nedan.*
Internet


<table>
<thead>
<tr>
<th>Varje dag</th>
<th>Några gånger i veckan</th>
<th>Några gånger i månaden</th>
<th>Aldrig</th>
</tr>
</thead>
</table>

B. Ungefärlig tid för tittande vid varje tillfälle:


<table>
<thead>
<tr>
<th>Tittar Aldrig</th>
<th>Nyheter</th>
<th>Sport</th>
<th>Hemvideo (ex. YouTube)</th>
<th>Musik</th>
<th>Film</th>
<th>Serier</th>
<th>Annat</th>
<th>Förtydlig annat</th>
</tr>
</thead>
</table>

15. Har du laddat ner och tittat på redan sända TV-program eller serier i efterhand?

JA  NEJ

Egna kommentarer

<table>
<thead>
<tr>
<th>Typ av medie</th>
<th>Namn och modell</th>
</tr>
</thead>
<tbody>
<tr>
<td>MP3 spelare med videofunktion</td>
<td></td>
</tr>
<tr>
<td>Portabel DVD- spelare med display</td>
<td></td>
</tr>
<tr>
<td>2G Mobil</td>
<td></td>
</tr>
<tr>
<td>3G Mobil</td>
<td></td>
</tr>
<tr>
<td>Dator med tillgång till Internet</td>
<td></td>
</tr>
<tr>
<td>TV</td>
<td></td>
</tr>
<tr>
<td>Radio</td>
<td></td>
</tr>
<tr>
<td>Mobil med WiFi/WLAN</td>
<td></td>
</tr>
</tbody>
</table>

Övriga eventuella kommentarer och tankar kring användandet av TV, Mobil och Internet:
Appendix 2

Fokusgrupp

• Hälsa alla välkomna och presentera syftet med fokusgruppen och varför deras åsikter är viktiga för mitt exjobb

• Presentera mig själv och låt varje deltagare ge en kort presentation om sig själva

• Svar kommer att vara helt anonyma och om intresse finns så får deltagarna ta del av resultatet från fokusgruppen

Mobilanvändning generellt

• Mobiltelefoner idag har ett långt vidare användningsområde än bara tal och SMS. Många har tillgång till ett flertal tjänster men användandet av dessa är generellt relativt lågt. Visserligen ökar användandet idag men det är fortfarande inte tal om några stora genombrott. Vad tror ni är anledningen till att andra tjänster än tal och SMS inte används i sån stor utsträckning?

• Vad skulle ni vilja att operatörerna gör för att få fart på nät och tjänsteanvändandet?

Alternativa följdfrågor:

  Såknas det tjänster som är relevanta?

  Är tjänster som finns idag för passiva? Vill man istället ha tjänster där användaren är mer aktiv?

  I vilken utsträckning tror ni priset på tjänsten påverkar?

  Andra orsaker?

• Vad för typ av tjänster tycker ni är intressanta att använda i mobilen? Varför då?

• När en tjänst används, hur lång tid används den då och varför använder ni den då? Alltså, finns någon orsak till att ni använder den då?

  Följdfråga

  Finns det några anledningar till att tjänsten används just så länge?
Mobil TV

- Många förutspår mobil TV som nästa stora genombrott för mobilen. Vad är er spontana uppfattning om mobil TV?

- Vissa typer av program kanske lämpar sig bättre för en liten skärm. Det pratas om att ha speciella program avsedda för mobil? Har ni några idéer på vilken typ av program eller innehåll som kan lämpa sig bra i mobil och varför då?

**Alternativa följdfrågor:**

_Vad är det som säger att mobil TV ska slå igenom när andra tjänster går trögt?

Här kan jag visa podd-castat material och streamad TV över 3G

_Fritt fram för egna kommentarer under visning som jag kan spinna vidare på._

**Följdfrågor**

_Vad får ni för reaktioner på det visade materialet?_  
_Ar det här något ni skulle vilja använda?_  
_I vilket sammanhang skulle ni i sånt fall vilja ha det?_  
_Hur upplever ni känslan av att se TV på en liten skärm?_

- Mobil TV är inte tänkt att ersätta ”vanlig TV” utan ska ses som ett complement eller en förlängning av den. Hur kan man skapa ett mervärde för användaren genom Mobil TV?

- Idrottsändelser och andra live händelser är ofta populära att följa via TV. Har ni några idéer för hur man kan göra sport och livesändningar annorlunda för mobil visning för att komplettera den vanliga TV visning?

- På Internet är det som ni alla säkert vet populärt att skicka vidare videoklipp och annat innehåll man tycker är intressant till folk man känner. Skulle ett sånt typ av användarproducerat innehåll vara intressant att ha tillgång till i mobilen? Vad är era tankar kring den samma typ av spridning av mobilinnehåll som på Internetinnehållet?

- Om ni skulle ha tillgång till mobil TV idag. När/under vilka förutsättningar tror ni att ni skulle titta då?
Övriga frågor

- Hur tycker ni att telefonens utformning med knappar, display storlek, tjocklek på telefon etc. bör se ut för att mobil TV ska bli användarvänligt?

- iPhone som ni kanske känner till har ju ingen riktig knappsats utan en stor tuch-screen display. Vilket alternativ föredrar ni och varför?

- Tror ni att det kommer bli viktigt för användare att själva vara med och påverka innehållet genom olika typer av interaktion med programmet? Varför då?

- Podd-castat material är ett sätt att se TV i efterhand genom att prenumerera på program som automatiskt laddas ner i din mediaspelare. På så sätt är man inte beroende av tid och rum utan kan själv välja när man vill titta. Tror ni att det kan vara en komplimenterande tjänst till mobil TV?

- Skulle man kunna utveckla live begreppet genom att ex. sända live fast med en fördjupning och med andra kameravinklar för att skapa ett annat innehålla av samma program? Exempelvis sportsändningar där man kan se viktiga händelser igen från en annan vinkel. Hur skulle det fungera tror ni?

- Utifrån det, har ni några egna andra idéer för hur man kan arbeta för att skapa ett komplement till vanlig TV med mobil TV?