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MOBILE
VIDEO

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MOBILE VIDEO

ABSTRACT

Watching a video, or moving image, on a mobile phone became technically possible in Finland during the latter part of 2002. Our study looks for ideas about the kinds of situations in which such mobile video possibility can be of use.

We gave a mobile phone with video capability to users who then watched mobile videos in different situations. They wrote down their evaluations about the meaningfulness of these situations in a diary.

It appears that there are at least two kinds of situations in which the use of a mobile video phone seems natural. Firstly, users can entertain themselves in boring situations such as during a bus trip or queuing in a store. Secondly, a mobile video offers the opportunity to share experiences, for instance, watching a karaoke video or children's animated cartoons.

Keywords
Mobile communications services, mobile communications devices, video, Internet

FOREWORD

The objective of the National Consumer Research Centre's research programme entitled "New markets and user needs" is to yield new results and approaches to meet the needs of a consumer-oriented information society. Identifying the demands of product developers and users of novel technology helps us at the same time to outline the interface between them and to understand modern consumption. New methods need to be evolved to promote the dialogue between the producers and users of these rapidly developing technologies. The consumer market in mobile communications is an area of especially lively innovative activity and novel applications.

The study "Mobile video" is one of the projects under the above research programme. The study was carried out under the supervision of Head of Research Mika Pantzar by Petteri Repo, Kaarina Hyvönen, Päivi Timonen and Mika Pantzar himself. The researchers had the pleasure of acting like a team of Santa Clauses, distributing new mobile "toys" to the study participants for research purposes – albeit only for the duration of the study. The test users did not get to choose their gift themselves nor did they have to pay for it. They were asked to give their genuine user experiences and critical feedback concerning the device and its services – and these they gladly provided. The study participants considered it highly important to supply this kind of feedback about their own experiences in different environments and situations.

On behalf of the National Consumer Research Centre I wish to thank all those who took part in this study. We are grateful to mobile operator Radiolinja for supplying the equipment for the study and for technical backstopping. Harri Alamäki, Ari Hyytiäinen, Mikko Mattinen and Pasi Nuppunen are especially acknowledged for contributing to the smooth implementation of this research. This study, which was conducted at a very swift tempo, shows that it is indeed possible to make the voice of the critical consumer heard in product development by working in co-operation with the companies in the industry.

Helsinki, April 2003
Eila Kilpiö, Director

1   INTRODUCTION

There is hardly another era in Finland's economic history when Finnish consumers and companies have played such a central role in determining the direction of the global consumer market. This applies particularly to the development of third-generation (3G) mobile communications. The unexpected success of text messages (SMS), at the latest, made it clear also to the companies in the industry that the boundaries of product and service development are not only technoeconomic (e.g. bandwidth and memory capacity) but, in essence, socio-human (cf. Kopomaa 2000). The creation of a market means creating totally new categories of products and needs.

The information society strategy of the European Union, and of Finland herself, places major emphasis on user-friendliness. Consumers play an increasingly important role in the ICT field as well. "Creating" a use and a consumer for a novelty item is an essential element in technological modernization. The perspective of the social shaping of technology (Pantzar 2003, Kotro & Pantzar 2002, Bijker & Law 1992, Bijker, Hughes & Pinch 1987, Mackay & Gillespie 1992) stresses the importance of justifying the need for a new item or service through public discussion, and especially the role of various interest groups in defining that need. Consumers are active players in this process.

Consumption dreams are transformed into concrete products and consumption decisions in an interaction process between product development, design, marketing and innovative consumers. Many new conceptual perspectives have, in fact, evolved around this thematics in the past few years: "User as collaborator, user as producer, constructive technology assessment, role of active experimenter, contextual design, emphatic design" (see Pantzar 1996, 2000).

The form of the dialogue between producer and consumer influences the content of innovations. One of the obvious reasons for failed product development projects is that the ways in which engineers, marketers and designers perceive the product, the need and the consumer, often lie too far apart (Deuten & Rip 2000, Griffin & Huaser 1996, Kaulio 1997). An even more serious problem is that the image of the consumer is generally quite one-sided (e.g. Latour 1996, Schnaars 1989). This consumer image tends to be more or less drawn from the technical world of the product developers themselves. Very little demand-driven research has been conducted, for instance, in development projects concerning household appliances, smart products and interactive devices (see e.g. Dholakia, Mundorf & Dholakia 1996).

3G mobile communications devices and services are in a stage of rapid development.
The 3G mobile phone is really the radio, record player and television of today. It is at the same time a new invention and a combination of old media technology. Huge expectations have been attached to the 3G phone, but, as previously, development has been largely technology-driven, even though the end user is frequently mentioned in the visions (cf. Pantzar & Repo 2003, Repo & Pantzar 2003, Repo 2002).

Invention of the need for watching mobile video is now underway. We do not yet know the purpose for which it would be natural to utilize the video viewing capability. The invention and development of video-related services is also still unfinished. However, instead of focusing here on the swift development of technology, we are primarily interested in identifying the kinds of situations in which users would consider video watching as meaningful. Our aim is to make the voice of the critical consumer heard in product development at an early stage.

2 WHY WATCH MOBILE VIDEO?

The possibility to watch a video or moving image on a mobile phone is something that has been envisioned and attempted for a long time, and still a couple of years ago not all experts agreed that it would even be technically possible. The general belief was that video viewing would only become practicable with the launch of 3G mobile communications devices.

In the technical sense, however, mobile video services became operational in Finland already in the latter half of 2002, before 3G mobile communications networks and devices. Thus, mobile video could be said to have arrived ahead of schedule. Users of media services, thus, had the chance to surprise both the industry and the research community by inventing novel ways of utilizing these services (cf. Koskinen, Kurvinen & Lehtonen 2002).

The basic aim of our study is to introduce the consumer viewpoint into product development. We apply a user-oriented approach to capture ideas about uses for the video viewing capability of mobile phones. These ideas are derived from the experiences of the test users participating in our study.

Our approach can be condensed into the following research question:
- *In what kinds of situations is it meaningful to watch mobile videos?*

This study is based on the research tradition of mundane reasoning, which examines and analyzes consumer choices and actions as routinized habits, practices and usage situations (for more information, see Timonen 2002, Reckwitz 2002). Identification of meaningful situations facilitates the development of service concepts and user applications. "Situations" here relate to both physical and social contexts.

We will not investigate the other services offered by the video feature besides video viewing. Video phone conversations (Nikulainen 2002) and MMS videos (Tuomisto 2002), for example, are not within the scope of this study.

The term "mobile video" here refers to a video clip viewed on a mobile terminal. The focus in our study is on videos watched on the display of a mobile phone, but videos can be viewed on other corresponding terminals as well. Terminology in this field is not yet established. A mobile phone with video capability is here simply called a "mobile phone" or a "videophone". No doubt the naming of these services and devices will have an important role to play once they are commercialized (Pantzar 2002).

3   VIEWERS AND VIDEOS

For the purposes of this study we asked the test users to view mobile video clips for a period of one week. Below is a more detailed description of both the viewers and the videos included in the study.

3.1   Diary entries about experiences

Since our aim was to collect user experiences of watching videos on a mobile phone in diverse situations, we distributed mobile phones with video capability to persons in different life circumstances for use during a period of one week. They were asked to watch videos and to evaluate the meaningfulness of viewing in the various contexts.

When the study participants received the phones, they were also given user training and instructions for video viewing (Appendix 1). Additionally, they were asked to keep a diary about the use of the videophone (Appendix 2). The diary was designed so that it prescribed a task for each evaluation day. It also contained more specific instructions and one A4 blank sheet per day for reporting. Some of the participants used up the whole space while others only wrote down a few principal comments. Each participant was entitled to keep the diary as he or she saw fit.

The fact that the participants saw their assignment as meaningful was particularly significant in view of study implementation. Keeping a diary is a burdensome task which is easier to carry out if it is considered important. To obtain comparable material, we further asked the study participants to watch videos in specific pregiven situations. Our request turned out to be unnecessary since they viewed video in the same situations in any case: at the coffee table, in public transport vehicles, while teaching the use of the videophone, and in connection with their hobbies.

We began the analysis of the study material by reading the diaries. After all four researchers had examined the diaries, we held a joint meeting to see what kind of themes emerged from the material. All of us were unanimous about the main themes, which we defined as: initial enthusiasm and eventual tiring, private and collective viewing, and good and bad viewing experiences. We then used these jointly detected themes to analyze the material and findings of the study.

The diary entries were scrutinized by dividing them into first-time experiences recorded on Monday, which was the first day, and complementing and broadening these first experiences with entries from the following days of the week. In the first-day entries we focused on finding different usage situations and viewing experiences, after which we continued the analysis by examining other usage situations in the course of the week. We divided the viewing contexts according to whether the person had watched videos alone or together with others. The findings are described based on this division.

The results presented here contain direct quotes from the diaries. To help the reader understand the quotations better the study participants are introduced by giving the age group and gender of the quoted person as background information. However, our interpretation of the results is not built upon these background variables. The results are interpreted by analyzing the descriptions of viewing situations found in the diary entries and weighing them against the research question: "In what kinds of situations is it meaningful to watch mobile videos?"

Ten mobile phones with video-viewing capability were distributed to the study participants for week 48/2002. Although the time period was short we still had the opportunity to examine both weekday and weekend use. In part of the households the diary was kept by two persons, so that the final study material comprises the experiences of 13 persons. Seven of the participants were female and six male, representing an even age distribution into age groups under 20 years, 20–40 years and over 40 years.

Apart from their own experiences the users had written down comments and experiences of their family members or others who had viewed their mobile video. The participants' households comprised altogether 24 persons, in addition to which the diaries contained comments from colleagues, schoolmates, fellow passengers, and friends.

The study participants considered themselves average users of mobile phone and Internet video services. Many regarded the mobile phone as a device for maintaining contact with friends, rather than as a working tool. When asked who paid their telephone bills, one person in the age group under 20 took care of the bills him/herself, while the bills of the other three in this age group were paid by their parents. Of the remaining nine participants, two had their bills paid fully and one paid partly by the employer, and five took care of their mobile phone bills themselves.

3.2   Mobile videos

The study participants were given a Nokia 7650 mobile phone for their own use for a week, equipped with preinstalled RealOne Player video replay software and necessary communications connections (Ill. 1). They were asked to view the mobile video selection supplied by Elisa.TV, described in more detail in Table 1.

ILL. 1. Nokia 7650 mobile phone, RealOne Player and Hyppönen Enbuske Experience.

Besides being able to watch videos, the persons testing the use of videophone were entitled to make domestic telephone calls and send text and picture messages free of charge. Only international calls and calls to payable service numbers were not allowed. The availability of other mobile phone features was intended to make the use of the phone seem as natural as possible. In fact, the test period resembled the first-week use of a new phone.

Mobile operator Radiolinja had preinstalled the settings required for video viewing. However, some of the users had to obtain and download the settings for picture messaging (MMS) on their phones themselves. This caused problems, even though technical support was made available.

The video clips to be viewed for the study were streamed to the mobile phone from the Elisa.TV server. Streaming means sending media from a server to the replay software installed in a terminal. This is a common way of transmitting videos on the Internet. Its special features, compared to downloading and storing complete videos, include fast start of video playing, small memory capacity requirement, and one-time nature of viewing.

It is possible to begin watching a streamed video before the entire video has been downloaded – just as soon as a sufficient amount of video has been stored in the terminal's buffer memory. The video will not be stored in its entirety, but has to be streamed again for each viewing. This is also why the viewer cannot send the video further or transfer it to another terminal. A significant advantage of streaming in mobile phones is that it does not require a big memory capacity.

Elisa.TV's mobile videos of were transmitted using a 22 kpbs connection. With such a narrow bandwidth the video has to be compressed to keep its file size small enough. However, at the same time the image quality deteriorates. Viewing the same Elisa.TV videos over the Internet implied that the reason for poorer image quality on the videophone was namely due to the compressing of the video.

The videos were viewed by making a connection to Radiolinja's mobile phone WAP service. A link to Elisa.TV's mobile video website had been saved in the phones, and the main page with the five latest videos and main headings of the available types of video could be accessed by pressing the link. The viewer could choose from karaoke, entertainment, music videos and children's programmes (see Table 1). The videos opened on the mobile display by pressing the link and answering "yes" to "Disconnect access point?"

Most of the videos to be viewed were supplied under the heading "Entertainment". Hyppönen Enbuske Experience (marked "Experience" in Table 1) was particularly dominant in the selection, with 15 videos showing clips of this TV talk show. Karaoke was played on 11 videos, and music videos and animated children's cartoons were both represented by 3 clips.

The selection was quite limited, since karaoke recordings and the Experience talk show together accounted for 26 of the total of 45 videos. Many programme categories (such as short films, TV serials, news, sports) were either totally missing or at least very scarce. Neither were there any topical, regularly renewed video offerings like news or clips on current affairs. The selection remained unchanged throughout the week.

TABLE 1. Elisa-TV's mobile video selection in week 48. (http://wap.elisa.net/elisatv/).

LATEST VIDEO CLIPS

1. Experience, Finntelligens
2. Experience, Transworld Snowboarding
3. ROCsport-Pallas
4. Insinöörit vauhdissa (Engineers in Action)
5. Heinäsirkka ja muurahainen
   (The Grasshopper and the Ant)

Karaoke
100 suudelmaa (100 Kisses)
Bumbum
Juankoski
Kesä yhdessä (Summer Together)
Rakastan (I'm in Love)
Täysikuu (Full Moon)
Unelmaa (Just a Dream)
Vaskikellot (Brass Bells)
Viihdyttää (To Entertain)
Viimeinen (Last One)
Villapaita (Woollen Sweater)

Entertainment
Experience, Koiranäyttely (Dog Show)
Experience, Avellan
Topmodel 2003
ROCsport Rovaniemi
Skede kaatumisia (Skateboard Falls)
Experience, Lapset (Kids)
Experience, Iiro
Kehonrakennuksen SM (Bodybuilding Finnish Championships)
Experience, Mika Salo
Smack Down 2002 Helsinki

Taikin naamiaiset (Masquerade)
Experience, Finntelligens
Experience, Transworld Snowboarding
Topmodel 2003 Trailer
Experience, Nylon Beat
Experience, Pate Mustajärvi
Experience, Outi Alanen
Experience, Blues
Experience, Darude
Experience, Jalkapallo (Football)
Experience, Ronan Keating
Experience, Aki Sirkesalo
Silakkamarkkinat (Helsinki Fish Market)
Valvoline SM-ralli 2002 (Finnish Rally Championships)
Tropicana Show

Music
Lordi Monsterman
Darude Sandstorm
Avril Lavigne Complicated

ROCsport
ROCsport-Pallas
ROCsport-Jussi Korhonen

Kids
Lumottu rupikonna (The Enchanted Toad)
Heinäsirkka ja muurahainen
(The Grasshopper and the Ant)
Pikkulintu (Little Bird)

4   VIEWING EXPERIENCES

The study participants were requested to watch videos in as widely diverse situations as possible. Their given task was to try to find meaningful ways of watching mobile video as part of their everyday life. They were asked to make particular note of situations in which viewing a video was fun and those in which it was uninteresting. In addition to viewing video in situations of their own choice, the study participants were asked to watch video clips at the coffee table, in a vehicle, and in connection with their hobbies. They were also requested to teach someone else how to use the videophone, and to take a picture with the mobile phone and send it further.

4.1   First contact with mobile video

The users' task for the first day was to view 10 videos and write down the type of video and the situation in which it was viewed. The clips viewed on the first day of usage were entertainment, music, animated films, silent films, sports, TV programmes, and karaoke. Videos had been viewed

- while riding in a vehicle (subway, train, bus, taxi)
- at home (on the sofa, in one's own room before studying, while watching TV)
- while waiting (in the garage during car repair, in the car waiting for the children, at the hairdresser's, during an intermission at a meeting).

On the first day the respondents had written about their enthusiasm and interest in trying out the videophone. The new feature – video-viewing capability – had aroused excitement and positive expectations in them. Watching videos in practice had at first been a positive experience for many. But already after the first test day some had grown disappointed in the videos. The following quote from the diary of a woman in the age group over 40 describes her feelings of enthusiastic expectation and disappointment.

> *When I received the phone I watched a couple of video clips right away – it was exciting to see live images on the phone and hear speech. After viewing a few videos I was a bit disappointed because they turned out to be rather boring. At first a duration of only a couple of minutes seemed quite short, but watching videos on that tiny screen made the time seem long.*

Another type of reporting found in the diaries involved evaluating the technical features and contents of the product. On one hand, technology was mentioned in comments about the ease of using the videophone. The device had been found easy to use, at least after first try. On the other hand, technical features were brought up in connection with defects and problems that had hindered the use of the videophone. Particular note was made of the inferior quality of sound and image and the long downloading time. The volume of sound, together with problems in adjusting the volume, had disturbed viewing.

The content of the video clips was also mentioned in the comments, both in a positive and a negative light. At first the videos had seemed interesting, but interest had changed to boredom already during the first day largely due to the uninteresting content of the videos. Especially the videos containing clips from TV programmes (Hyppönen Enbuske Experience) were considered boring.

The study participants had watched videos both alone and together with other people. They had usually tried out the device first on their own, but later in the day used it in company as well. They had demonstrated the phone to their family members and watched video clips in public transport vehicles. It had been especially important for young users to stand out from the rest; they had hoped that other people would take notice of their new phone. The quotation below describes the sentiments of a woman under 20 years and the attitudes of others toward her videophone.

There were many other people standing at the bus stop where I viewed the videos, but no one seemed to pay any attention to me and my phone. That really bothered me because I had hoped that people would be looking at my sophisticated phone with envy.

The first-day experiences included many situations in which video viewing had felt pleasant and also some in which it had caused negative feelings. Users considered watching a video clip as a good way of passing time especially when they were waiting for something. It had been relaxing to watch a video during a break at a meeting. Viewing a music video in the backseat of a taxi had felt nice and comfortable; one was left to oneself. Singing a karaoke song in the car while waiting for the children to get out of school had made time pass faster. Another positive experience concerned watching videos at home with the children; even very young children are interested in videos. Animated films, karaoke recordings and music videos were regarded as the most interesting.

Negative experiences had to do with viewing videos in public transport vehicles. Users felt that the video sound had disturbed other passengers. The following quote from the diary of a man in the age group 20–40 years describes his experiences of the first day from various aspects. The user had responded to Monday's task by listing the contexts in which video viewing had been fun or boring as pluses and minuses. The pluses include positive evaluations of the usage situation and of enjoyable videos, whereas the minuses list negative experiences particularly of the technical features of the device.

In the car, at home and at the sports centre:
+ *Fun to watch video clips on the phone*
+ *Funny cartoons*
+ *Way of passing time while waiting*
- *Downloading takes too long*
- *Poor image and sound quality; earphones might help to improve the quality of sound*

4.2   Reinforcing the experience

A general observation in examining the initial experiences and the entries later in the week is that all of the themes found at the end of the week are already found in the first-day diaries: enthusiasm and tiredness of viewing, watching videos alone and together with others, and positive as well as negative experiences. We will now complement and broaden these themes by making use of the diary entries at the end of the week.

ILL. 2. Coffee break.

The tasks for each day gave a certain situation in which to view video – such as at the coffee table, in public transport vehicles and in connection with hobbies. The diary entries show that videos had been viewed at home at the dinner table, on the sofa and in one's own room, in the school cafeteria, at the workplace during coffee break and during a meeting, at a friend's house, in a coffeeshop, at McDonalds', in the garage, in the car, at the bus stop, on a tram, on the train, on the subway, at the hairdresser's, at the barbershop, in a movie theatre, at a fitness centre, at a sports centre, during floorball practice, in the audience at a floorball match, in the locker room, in a shop, at a rummage sale, at a customer association's meeting, on a walk outdoors, and in Helsinki's nightlife.

When to watch?

The most important video usage, according to the diaries, was to avoid boredom, that is, get over unpleasant situations. Standing in a cashier's queue and being caught up in traffic during rush hour are good examples of such dull, disagreeable situations. Moreover, students and school children could take a break from their studies by viewing videos. The respondents felt that videos helped them to relax and turn their thoughts elsewhere; this usually referred to in situations in which the user had watched videos alone.

ILL. 3. Hobby.

Watching videos also helped to entertain children who were growing tired of watching family floorball, and others present as well. A woman over 40 describes this in the following:

The daughter of one of the mothers had already grown impatient – she was getting tired of watching the games. So it dawned on me: why not let her watch animated films while the boys were playing? I showed her the first video on the list of cartoons and she was really happy – and the mothers, too, were all excited. A few fellows from the opposing team also glanced as if to say: what on earth... The little girl watched another clip and I started playing a third one, but then the connection broke.

Besides helping to avoid boredom, video viewing can be considered a positive experience in itself. The best example of this were the karaoke recordings (Ill. 4); most of the users' favourable comments were, in fact, karaokes. People had viewed karaoke videos together and sung to their accompaniment in the school cafeteria, at a floorball tournament, in Helsinki's nightlife, and on the subway. Karaoke songs interested users of all ages and their companions as well. The first quotation below is from the diary of a woman under 20 and the second of a woman over 40.

ILL. 4. Karaoke on the subway.

We watched karaoke today in the school cafeteria. It was fun with all of us at the table singing together. The other diners looked at us with an expression of "good grief!" on their faces, but we didn't let that bother us.

I was fiddling with my phone when I heard one of the mothers say she was going to a party that evening where they had karaoke. It hit me that she could practice beforehand on this phone. I put the Juankoski piece on – and the mommies were delighted. When Juankoski was finished I put on Jari Sillanpää, and it got better and better. They really grew excited.

When not to watch?

Video viewing was considered unpleasant when it disturbed other people and when there was a technical failure. The respondents felt that videos had disturbed other people especially in public transport vehicles, which were otherwise regarded as natural places for viewing. Below is a description of a tram ride by a woman aged 20-40 years. This viewing situation had been recorded on the first day of usage.

> *Listening to a video clip without earphones on the tram feels as intimate as a phone conversation, and I'm afraid of drawing the attention of the weirdos in the backseat with this device. I note that the young man standing next to me in the middle part of the tram is watching my phone as he hears sound coming from it.*

Similar observations had been entered in the diaries on Wednesday, when the users' task was to watch videos in public transport vehicles. A man over 40 comments on what it feels like to watch videos in a public vehicle:

> *I wouldn't watch videos on a bus. What if the person sitting next to you is somebody who's exhausted after work and harassed by his boss, and who will only be irritated by the crackling sound. No thanks.*

Image and sound quality were criticized both in the first-time experiences, in entries from the other weekdays, and in Sunday's summaries. Users further commented about video downloading and the length of the clips. Downloading was mentioned if it had failed or if the user had grown tired of waiting.

Learning and teaching how to watch mobile videos

When the users received their mobile phones each one was given personal training in viewing videos on the phone as well as written instructions for use (see Appendix 1). Thursday's task was to teach someone else how to use the videophone. The study participants were asked to describe the learners' first reactions and any changes in attitude as the trial proceeded. In the summary questions they were asked to revert to their own learning experiences and to evaluate the clarity of the instructions for use and the ease of learning to view videos on the phone.

The use of the videophone was generally regarded as easy. Those who commented on the instructions for use considered them clear. Part of the respondents had not read the instructions but instead had learned to use the videophone by experimenting. The study participants had responded to Thursday's task by teaching video viewing to family members, schoolmates and colleagues, and friends. The device was deemed easy to demonstrate, or at least teaching had become easier after the user had first tried out the functions for him/herself. The diary entries describing the learners' reactions contain the same kind of expressions of enthusiasm and disappointment as the first-time experiences of the study participants themselves. Learners had at first been interested and eager to learn, but became disappointed when the videos did not meet their expectations or if viewing had failed due to technical problems. A man in the age group 20-40 years commented on the teaching situation as follows:

> *My colleague tried to watch a video but right then it got stuck, even though everything had worked fine before.*

Taking pictures and sending them

The special task for Friday was for the study participants to take a photograph and send it to someone from the phone. Taking the picture was considered easy and fun, but users had had problems in sending it because adjusting the settings were considered difficult. Not everyone had managed to send the picture, at least not so that the recipient had been able to open it on his/her own phone. The following words of a "lucky" man of 20-40 years describe his experiences of taking the picture and sending it:

> *Taking a picture is way simple. Sending is easy, too, if you've first known how to obtain and install the correct MMS settings. But the e-mail settings were already much more difficult. Luckily I managed to find settings that enabled me to send the photos to myself by e-mail. Saving the settings was absurd. I can't see why they had to be installed by the user.*

Despite initial difficulties in sending photographs, the camera was regarded as the best feature of the videophone. The comment of a woman under 20 represents the opinion of many of the study participants.

> *The camera is the only reason why I think it's worth buying a videophone.*

Making continuous choices

Viewing video on the mobile phone is based on making choices. The user has to access and select the services that he or she deems most interesting. What if a user does not want to be an active consumer who makes continuous decisions, but instead prefers to be passive and is happy with the choices made by others? In the following, a man in the age group 20–40 years compares mobile video to the radio. This quote is from the third day of usage, when the had gained considerable experience of watching mobile videos. By this time he had already grown tired of video and gone back to his previous form of entertainment – the radio. He mentions poor sound reproduction and the need for constant choices as weakness of mobile video. In the opinion of this user, the radio, which does not call for much active choice-making, gives the listener a chance to follow a narrative and, at best, offers surprising choices.

> *Sitting in my car again. The poor sound quality annoys me a lot. I prefer turning on the car radio. With the radio you don't have to be looking every 4 minutes for something to listen to or watch, because the radio will go on playing for a week on end if that's what you want. It's also nice not having to make choices for yourself since the programme hosts will carry the story forward and select the music – you have to have some element of surprise in your life.*

We also asked the study participants to estimate what they would consider a suitable monthly fee for unrestricted video viewing in the future. The estimates were mainly within the range of 10–15 euros regardless of whether the viewer paid the telephone bills him/herself or not. Users were not asked how much they themselves would be willing to pay for the video capability. A few of them actually wrote that they themselves ought to get paid for watching video (!). By talking about the future we implied that the service would then most likely function better technically and that video selection would be significantly wider and more interesting than at present.

The users' ideas for development were mainly concerned with the video selection and the technical aspects of viewing. In the diary summary they were asked for their opinion of the kind of videos that should be developed for mobile phones. Users asked for video clips on current affairs, and a continually renewed supply and wide selection of videos. They felt that the viewers' interest could be maintained if the selection were regularly updated. Other preferred videos included news clips and synopses of topical TV programmes and documentaries. Presentations of new films of the week were also mentioned as interesting video topics. Proposals for a wider selection referred to news as well as entertainment – for example, economic affairs, tourist attractions, sports, and pornography.

On the other hand, the responses also suggest that programmes designed for other media were not necessarily suitable for mobile phones. The following is the opinion of a man aged 20–40 years.

> *Contents taken from other media (like TV) can't be converted, just like that, for a mobile phone and a tiny screen, poor earphones or situations where you can't hear a thing. Either the contents should be designed so that they work on a mobile, or two parallel versions of manuscripts and films should be made already at the production stage.*

As for technical weaknesses, the poor quality of sound on the videos received the most criticism. To watch a video, one has to hold the mobile phone in front of one's face, which is not optimal for audibility. Users also believed that the poor quality of sound disturbed other people. The loudspeaker of the Nokia 7650 phone is not particularly good for viewing purposes, and there were no earphones or handsfree devices used in our study.

The phone settings installed for the purposes of this study worked well. However, viewers had problems in making other settings on their phones. For example, obtaining and saving the settings for MMS messages was difficult, even though technical support was made available. Saving the settings for sending pictures to e-mail addresses was also very troublesome. An experienced user also failed to install competing video replay software in the phone. The ease of phone settings is, therefore, an aspect which deserves special attention when new services are developed.
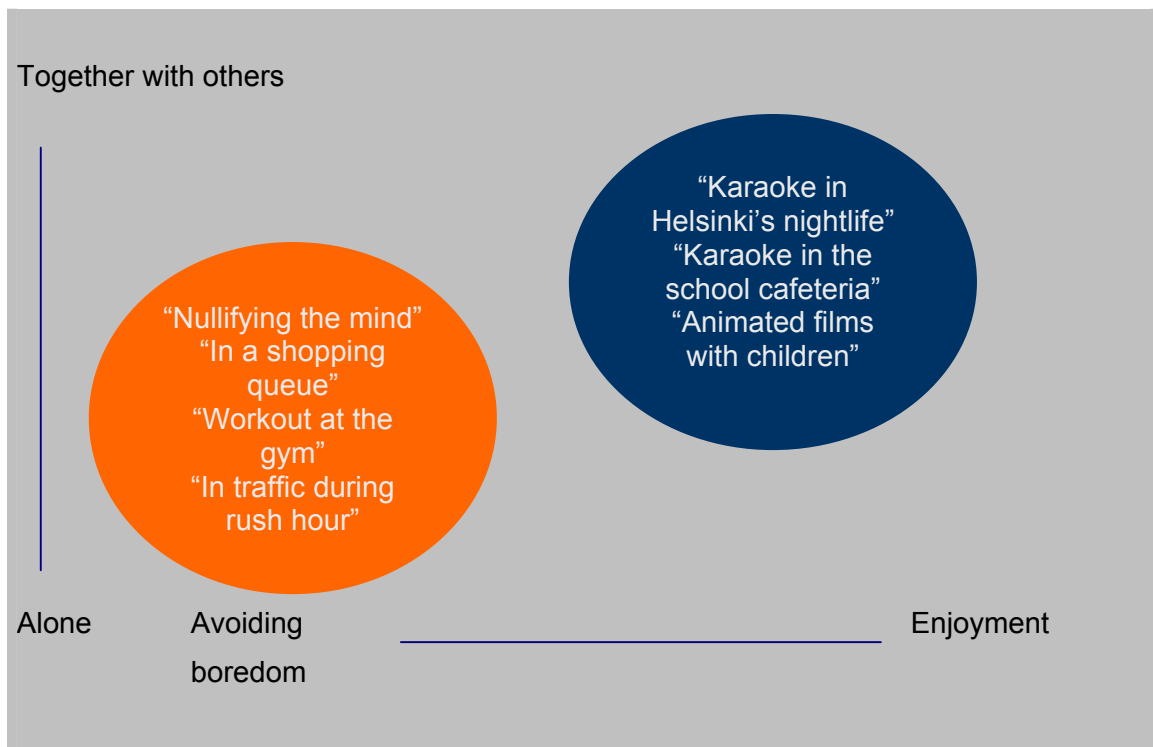
5   CONCLUSIONS AND DISCUSSION

The mobile communications sector prefers to emphasize independence of time and place, but the usage context of devices continues to be an important question (Myerson 2001). This is also true of the mobile videophone.

In this study we sought ideas about the kinds of situations in which the video capability of a mobile phone would be of use. We distributed mobile videophones to persons representing different age groups, requesting them to watch mobile videos in a variety of situations. They were asked to record their evaluations of the meaningfulness of the viewing situations into a diary.

It seems that there are at least two kinds of natural situations for using the videophone. People can entertain themselves by watching videos in a dull situation such as during a bus ride or while standing in a cashier's queue. Mobile video also offers an opportunity to share experiences by watching a karaoke video or animated cartoons together with others (Fig. 1).

FIGURE 1.

Together with others

"Karaoke in Helsinki's nightlife"
"Karaoke in the school cafeteria"
"Animated films with children"

"Nullifying the mind"
"In a shopping queue"
"Workout at the gym"
"In traffic during rush hour"

Alone   Avoiding   Enjoyment

                 boredom

5.1 Interpreting the viewing experiences

Our study focused on the use of mobile videos in different situations. We wanted to examine various everyday routines related to the use of mobile video. Instead of using a narrow consumer research approach we sought to identify what kind of routinized habits, practices and feelings were associated with watching mobile videos.

What can we say about the future use of mobile video on the basis of this study? We feel it tells most about initial-stage experiences of usage. Our research setting stresses the process of learning to view mobile videos and finding meaningful contexts in which to watch them. In fact, the study participants sought situations for viewing videos that were partly unfamiliar to them.

More natural long-term usage contexts could only be discovered after a longer period of use. There is a distinct need for more thorough research. This would, however, necessitate a wider selection of videos and a research method that would interfere less with people's normal everyday life. It would also be important to examine those services that are enabled and created by video capability. Perhaps the very meaningfulness of mobile video will emerge from such services.

By selecting an approach which emphasizes routinized habits and everyday practices we did not, in the first place, seek to evaluate the technical aspects of watching videos. Questions related to the user connection, bandwidth and pricing were only brought up in case they had a significant impact on the enjoyment of viewing. This delineation is a relevant one since the video application studied here was, in practice, a prototype. In other words, basically it did not function as well as the final version that would be launched eventually.

Our approach with its emphasis on routinized habits and practices proved successful in the sense that the evaluations recorded in the diaries recurred irrespective of the user. This indicates that we managed to obtain a set of data which represents a variety of user experiences over a short period of time. The independence of the user shows that we were able to achieve our aim: a general assessment of the situation as it is at present.

We sought a general assessment because our primary focus was not on individual persons and their preferences. A study of individual preferences would have required a much longer time span so that users would have been able to find viewing situations that were meaningful to themselves. Therefore, we will not even attempt to foresee how people's viewing situations will be shaped in the future.

5.2 Inventing the need for mobile video

As researchers, users and producers, we are currently in the process of inventing a new kind of need for mobile video. This is by no means a new situation in the light of history. Similar needs had to be invented for the telephone, radio, television and record player in their time (Pantzar 1996, 2000). Their real meaning to users only began to emerge with the passing of time. The struggle to define the need for the record player offers an excellent research model with respect to 3G mobile communications devices (Siefert 1995). Thomas Edison was developing a utility device according to industrial principles, and technical quality was the foremost concern in his phonograph records, not the singer (see also Basalla 1988). Emil Berliner, who eventually won the struggle, was developing the novelty on the terms of the emerging consumer society, believing in the power of megastars like Enrico Caruso.

The multiple dimensions and phases of inventing the need for mobile video can be compared to Siefert's (1995) findings concerning the development of the need for the record player. Next, it might be fruitful to consider what aspects we can define related to 1) naming of the novelty product, 2) its social positioning, 3) its functional positioning, 4) its product-group identity in the product chain, 5) its functional identity, 6) its narrative identity and 7) its user identity (Pantzar 2002).

In naming the product it is essential to decide, for example, whether to associate the product primarily with services or with technology (e.g. mediaphone or WAP browser). When service suppliers talk about entertainment it is a question of social positioning of the novelty. Determination of its functional positioning occurs parallel to determination of social positioning. Thomas Edison saw the place of the record player in the home next to the hearth, and in the shop in the same department as the piano. Similar issues will also affect the future of mobile video.

"Video" or moving image belongs to the terminology in the field, complementing "audio" or sound. Already at an early stage in this study, however, it became clear that the term video is not very suitable for telling an uninformed person what we are talking about. Video is something that is easier to associate with television, a video player or a DVD player rather than with a mobile phone. Only in the case of music videos is this identification more appropriate.

At the same time, in the absence of a clear functional use, mobile video begins to lose its attraction. There is no way the mobile phone, as it is now, can compete with established and advanced video viewing equipment on their terms. Instead, it might be better in the beginning to talk simply about mobile services and then concentrate development efforts in that direction.

The respondents evaluating the use of the device considered the selection of 45 videos in our study as insufficient. They wanted a more comprehensive, topical and regularly renewed supply. The mere technical capability of watching videos was not enough to maintain their interest. This indicates that the development of the mobile video service calls for considerable investment, if it is to be made popular.

The selection of mobile videos offered by Elisa.TV was far more narrow and of technically inferior quality than its video supply on the Internet (http://www.elisa.net/elisatv). This would imply that the quantity and quality of the supply can easily be improved, once mobile terminals, data communications connections and service concepts evolve further.

The limited selection of video clips affected the users' experiences about the meaningfulness of watching videos. Still, it was important for the study that there were any videos at all available publicly. It was more interesting to investigate a real situation than a test environment constructed specifically for the study. Fortunately, the limited video supply did not have so much influence on the meaningfulness of the viewing situation or the reactions of other people.

If the videophone follows the development of other modern media technologies, we may propose assumptions about its future. First, inventing the need for the videophone will probably take more time than we now imagine. A likely trend is from a toylike and experiential nature of the device towards a utility function. Poor technical quality and few utility applications are characteristic of the initial development stage of a novelty product.

Second, predicting the final shape of the utility function is next to impossible. The wired telephone, for instance, was originally foreseen as a rare device for one-way communication. The idea was that every village should have one so that people could gather to hear the news. Moreover, the telephone would make it possible to listen to opera concerts and theatrical performances.

What speaks in favour of the videophone, however, is the fact that it is not a totally novel invention. Today, mobile phones are very widespread, and connecting a video capability to them is not as great an innovation as inventing a completely new device. In this sense, video capability is just one new feature among the other features of a modern mobile phone.

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ANNEX 1:
Instructions for video and picture messaging services

The settings for the above services are already configured on your mobile phone.

(The joystick is used for navigation within the menus of the phone. Functions are activated by moving the joystick up/down or sideways and pressing it at the desired function.)

Video services

Open the menu by pressing the *Menu* key (image key). Select the *Services* icon. Under *Services* you find the bookmarks for *WAP services*. Select *Radiolinja WAP*. The phone asks you "*Phone connection required. Connect now?*". Answer *Yes*. You are now on the Radiolinja WAP main page. Select "*DJ Eskon viihde*" (DJ Esko entertainment) from the main menu and from there the page for *Elisa TV videos*. You are now on Elisa TV's pages and can save a bookmark for this video page by selecting *Options -> Save as bookmark*. This enables you to access this page next time directly without any intermediate phases.

There is an *Instructions for Users* section at the beginning of Elisa TV's pages. By moving the joystick down you can see the 5 latest videos. The video contents have been divided under 5 main headings (Karaoke, Entertainment, Music, ROCsport, Kids). There is also an additional *Instructions* section for the RealOne Player program installation. By selecting *Karaoke*, e.g., you see the list of available karaoke videos and can choose the one you want. The phone is set to to RealOne Player mode and asks "*Disconnect access point? Radiolinja WAP?*" Answer *Yes.* Next the phone connects to the desired video clip and starts playing it. You can adjust the sound volume by moving the joystick to the left or right. You can pause or stop the video while it is playing. When you press *Stop* the phone gives two alternatives: *Options* or *Back*. Through *Options* you can either continue playing or exit the player and return to Elisa TV's *Karaoke* menu. The *Back* key takes you directly to the Elisa TV menu. You can stop WAP navigation by selecting *Options* and then *Exit*.

Picture messaging (MMS – Multimedia Message Service messages)

Select *Camera.* To take a picture press the joystick. The photo is saved automatically in the *Images* application. Select *Options -> New picture*, if you want to take another picture. You can also send the photo immediately. The *Send -> Multimedia* function edits it to a multimedia message. Add any text you want and send the picture to the recipient's MMS phone by using the *Options* key. You can also send the photo as an e-mail message to the desired address. *Send -> e-mail* edits it to an e-mail message. Insert the recipient's e-mail address, add text, and send the message through the *Options* key to the recipient's mailbox. You can also access the *Images* application through the *Options* key. In *Images* you can view all the pictures stored in the memory of your camera. Through *Options* you can select more than one photos at the same time and send them together, e.g., as an e-mail message.

The RealOne Player program occupies a large part of the memory capacity of your phone. Therefore, in order not to run out of memory, do not keep more than 10-15 images maximum stored in your phone's memory. Running out of memory may block your phone, and it can only be unblocked by taking it to be serviced.

Also please read the enclosed Nokia 7650 User's Guide.

ANNEX 2:
Diary format

Please watch video clips in as many different situations as possible. We are looking for meaningful ways of viewing mobile video as a part of everyday life. Sometimes it takes time to find a suitable usage or context, so it is worth keeping on trying even though it may at first seem difficult.

We ask you to keep a diary about what you have viewed. You can write down your experiences any way you want, e.g. as a list of main issues.

We are especially interested in your experiences of different types of viewing situations. When was viewing fun and when was it not? You can also let your family watch videos for themselves and tell about it.

- What types of videos did you view today and in what kind of situations?
- What felt like fun and what did not?

Apart from viewing videos in general, we have given you a special task for each day. The aim is to ease the study process and enable us to compare the various experiences. The order and timing of the tasks is not significant, but we would appreciate your performing each of them.

Monday:	View 10 videos
Tuesday:	View videos at the coffee table
Wednesday:	View videos in a public transport vehicle
Thursday:	Teach someone to use the mobile videophone
Friday:	Take a picture and send it
Saturday:	View videos in connection with your hobbies
Sunday:	Write a summary

Summary

- What type of videos did you prefer viewing (e.g. sports, entertainment, music)?
- In what kind of situations was it especially fun to view them? Why?
- In what kind of situations was it unpleasant or not fun? Why?
- Was it more fun on weekdays than on weekends? Why?
- In your opinion, what kind of videos should be developed for mobile phones (e.g. short films, serials, news, X-rated videos)? Why?
- Did you grow tired of watching videos? Or did you already form a habit of viewing?
- Who else watched videos with you (e.g. spouse, child, colleague, fellow passenger)?
- How did other people others say about video watching?
- Were the instructions for use clear enough? How could they be improved?
- Was it easy to learn to view videos? Was it easy to teach others how to view videos?
- Was it easy and fun or difficult and uninteresting to take pictures and send them?
- What would you consider a suitable monthly fixed fee for unrestricted mobile video viewing in the future?
- Anything else?

The instructions for viewing videos are enclosed. Please note that due to the video program it is not possible to store many photos in the phone's memory. The following persons provide user support for video viewing: Petteri Repo (phone number) and Esko Kurvinen (phone number).

Besides watching video clips you can use your mobile phone to make domestic phone calls, take pictures and send text and picture messages free of charge. *International phone calls and calls to payable service numbers cannot and may not be made.* Please take good care of your mobile phone.

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