

Personal Television: A Qualitative Study of Mobile TV Users in South Korea

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ABSTRACT

This describes a qualitative user study of mobile phone TV usage undertaken during September 2005 and centered on the real world Mobile TV usage of subscribers of the recently launched live service in Seoul, South Korea. Data collection and reporting methods were optimized to inform and inspire future [ANONYMOUS] product development.

The study identified four primary use cases: at home; during the evening commute; macro-breaks; and secret use. Both home and commuting use are likely to be significantly culturally dependent. Barriers to use include: battery life; screen size; lack of compelling content; poor coverage. Design implications are discussed. The study suggests that if the current barriers to use can be overcome Mobile TV is a viable competitor to existing forms of entertainment and media consumption.

Mobile TV provides the user with a choice of content in a setting of the user's choosing. These and related findings led us to believe that Mobile TV is more about personal experiences, than the need for mobility itself and we therefore consider Personal TV to be a better descriptor of this service.

Categories and Subject Descriptors

[H.4.3 Communications Applications]; [H.5.1 Multimedia Information Systems]

General Terms

Design, Human Factors

Keywords

Mobile TV, Personal TV, Radio, South Korea, Seoul

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1. INTRODUCTION

Digital Mobile TV is currently being hyped as the 'next big thing' for mobile phones. Given the difference between the mostly stationary television viewing habits and the mobility inherent with mobile phone use what kind of user experience is possible? To answer this question a [ANONYMOUS] research team conducted a field study of Mobile TV service subscribers to document their experiences and to consider the implications for future designs. Seoul was selected as a destination for the study because TU Media, the South Korean telecommunications operator launched a commercial live Mobile TV service in May 2005.

Readers should note that the experience of watching Mobile TV may vary significantly in different locations not least due to technical implementation, content availability, and cultural differences.

1.1 Background

Seoul has an official population of approximately 10.3 million; however when proximate satellite cities are factored in the size is closer to 48 million. The subway system is the easiest and fastest way to move around the city with minimum chance of delays and one-way commuting times of over an hour are common. The Seoul subway has good cellular connectivity and use of mobile phones for communication is a common sight. These factors suggest this to be a prime location to understand the potential of Mobile TV [1].

Consumers in South Korea have a number of ways to watch TV on their mobile phones: downloading via PC; streamed via web sites; video-on-demand; and via broadcast. Analogue services are offered in handsets such as the NEC N940 but are notable for their poor reception. Many conventional TV programs are widely available for live streaming and downloading from the internet shortly after being broadcast, with saved files transferred via USB or direct to memory cards.

From the user's perspective the digital broadcast of broadcast of live Mobile TV is similar to conventional TV prior to the personal video recorder (PVR). Once switched on a TV channel loads, the user can switch channels though the pausing of content is not available if the situation demands [2, 3].

The most widely proposed and explored delivery technology is DVB-H (Digital Video Broadcasting- Handheld) [4], so far tested

in a dozens of countries since it emergence in 2004. The Mobile TV trial in Korea however relied on an alternative standard - DMB (Digital Multimedia Broadcasting) [5]. DMB handsets and infrastructure are incompatible with those provided for DVB-H and vice versa. Unless otherwise specified Mobile TV refers to live Mobile TV broadcast.

1.2 Prior Research

A number of surveys, Mobile TV service pilots and simulation system tests have suggested that Mobile TV is widely welcomed by mobile phone users [1, 6-9].

In VTT Mobile-TV project, a prototype system was setup in 4 types WLAN hot-spot areas: outdoor, workplace, home and cafeteria. The user field trials found out: (1) it was considered similar to television, rather than wireless multimedia, even TV-on demand feature that were offered were liked by users; (2) user's normally watch short programs or segments from long programs. News was found most popular amongst adults; (3) it was used generally as a replacement for reading the evening paper (waiting for something, killing time); and (4) Watching Mobile TV was primarily a serial-solitary activity [1, 7].

That Mobile TV was considered to be like television rather than wireless multimedia underlines that conventional TV design principles should be considered for this new service [10, 11]. MobiTV, a streaming live TV mainly available in US, utilizes a number of interaction design conventions of regular TV including: that content is played by default once turned on; and that the user can switch or hop quickly to different channels [8].

Knoche ran a series of experimental studies to explore questions of image resolution, video bit rate, and text legibility and proposed that Mobile TV viewing was likely to be transient, involving low user commitment; that users were worried about being too absorbed and becoming distracted from other tasks [2, 12-14].

The Mobile TV forum initiated a dozen of DVB-H pilots worldwide. A large scale Finnish trial in 2005 suggested that: (1) familiar conventional TV programs were the most popular content, followed by sports and news channels; (2) that the primary context where Mobile TV was watched was traveling on public transport; and that it was also a popular compliment to home TV watching [6].

The prior studies observed participants who were recruited to use the service for the duration of the study. It is our understanding that this is the first study of actual subscribers of the service – with responsibility over their own phone bills.

In addition the nature simulated trials meant that the service coverage was available only in limited areas, for example, VTT Mobile-TV study deployment was limited to 13 WLAN hot spots [1]. Therefore that real use contexts and consumption patterns have not yet been systematically explored. As described in [15], the “design drivers” research is essential for product and service design.

1.3 South Korea Mobile TV Field Study

The aim of the South Korea Mobile TV study was to explore the range of factors that would affect the Mobile TV viewing experience from understanding how it affects mobile phone use,

and consider the aspects of this experience might be unique to the Korean context.

The research focus included understanding: motivations for using Mobile TV; barriers to use; contexts of use; user behaviors within these contexts and design implications for future products and services.

2. RESEARCH DESIGN

The research study was conducted in September 2005, 4 months after TU Media launched their Mobile TV trial.

2.1 Methodology

A major factor influencing methodology of the field study was the desire to minimize duplication of existing research. A major study in South Korea [16] had already collected quantitative data such as when people were watching what content, and the amount of time spent viewing that content at what times of the day. We therefore decided to conduct contextual interviews and observations and combine these with home based in-depth interviews.

During contextual interviews the research team spent time where participants used Mobile TV, entertained, and browsed content. The sessions, which were largely unstructured, were started in public spaces and lasted for up to three hours. Participants were also observed and were sometimes asked questions and to talk the researchers through activities.

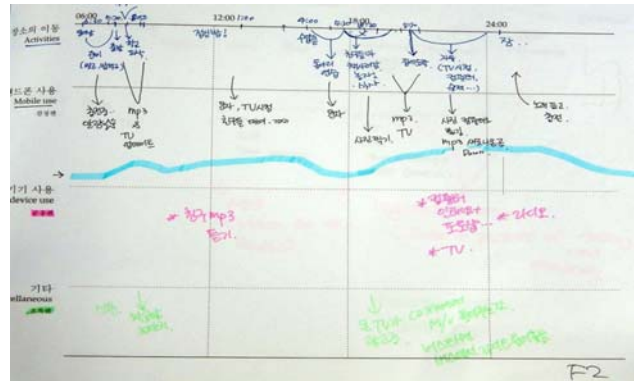


Figure 1: Day mapping

Home interviews started with participants noting down activities undertaken during the course of a previous day, overlaying information such as mobile phone, MP3 and Mobile TV use, contexts and so on. The resulting day-map was used as a prompt for interview questions. Home interviews were based around structured questions and lasted no more than 90 minutes.

Shadowing of participants was initially tried but abandoned because the quality and quantity of useful data generated from this method was insufficient for our purposes [17].

Complimenting the interviews, data was collected from ad-hoc observations, visits to carrier and mobile phone shop and service centers, cafes, bars, and using different modes of transport.

All interviews were conducted in Korean by a native speaker and later transcribed, and translated into English. Reviews were carried out to ensure the team understood the cultural significance of particular issues.

2.2 Study participants

4 male and 4 female participants were recruited, 7 of whom used live TV services (TU Media) and one of whom used a live streaming (June). The June user was recruited to obtain a sense of the differences between services though it was not our desire to make a rigid comparison. The mean age was 24.13 years old. 7 participants were not married, 6 participants shared their apartment with their parents (common in South Korea) and 5 did not have a TV set in their personal bedroom.

Table 1. Research participants, Mobile TV use

User No	Age	Weekly usage*	Device ownership
F1**	22	120 minutes	2 years
F2	17	720 minutes	3 months
F3	29	350 minutes	2 months
F4	31	240 minutes	3 months
M1	17	400 minutes	3 months
M2	19	150 minutes	2 months
M3	25	240 minutes	2 months
M4	33	400 minutes	2 months

* Weekly usage includes both Mobile TV and radio channels

** Live streaming (June) user

Participants used 3 types of mobile phone the Samsung June SCH-v330, TU Pantech & Curitel PTs130 and the TU SKY IMB-1000 (left to right, figure 2). The SKY IMB - 1000 was used by 6. Recruitment was arranged by a local market research company and participants each received in the region of 80 Euro as a reward for taking part.



Figure 2. Participant phone models

2.3 Research Team

The research team consisted of two user research specialists based in [ANONYMOUS] and [ANONYMOUS] respectively, and one native Korean concept designer based in [ANONYMOUS].

In addition 4 South Korean post graduate students from [ANONYMOUS] University HCI laboratory joined the study during the data collection stage. During contextual and home based interview sessions researchers were paired so that each interview-team included at least one female and at least one native Korean speaker.

3. DRIVERS FOR USING MOBILE TV

3.1 A Desire to Kill Boredom

Given the long commuting times by subway and bus and the widespread cellular coverage in these areas it is no surprise that Mobile TV was used at these times as tool to kill boredom.

Situations included extended waiting periods in a car whilst girlfriend is having a hospital appointment (Figure 3), waiting for friends in bars, plus use in the bathroom and whilst sitting on the toilet.

M4: "... wanted to watch real time TV programs when waiting for someone (having a hospital appointment), so I started to use mobile TV..."



Figure 3: Watching to kill time whilst waiting

3.2 Novelty, a Desire to Be First

The commercial Mobile TV service had only been available for 4 months at the time of the study and as such all participants were early adopters of technology. As well as the service, the sliding keypad in the SKY IMB - 1000 device (far right, figure 1) was the first of its kind form factor on the market. To some extent Mobile TV was considered just another gadget they had to try.

Novelty is enough to draw people into using a service. It may become the reason the same user's rejects that service later on. After just 3 months use, one participant (M2) expressed boredom with Mobile TV.

3.3 Staying up to Date with Popular Events

As with prior studies [1, 2] a driver for adoption was that it enabled users to stay up to date with popular events, in particular via music and sports and game shows. However news was not mentioned by our participants as being a popular content type.

M1 "I can know the popular songs faster than others by listening to the audio channels of Mobile TV"

One possible reason for lack of interest in news content was that our participants were relative young, preferring entertainment over more weighty content types. On the other hand participants may have preferred to access news via other content channels such as browsing the web at one of the many popular and oft frequented internet cafes.

3.4 Other Motivations

No participants mentioned compelling content as a reason to subscribe to Mobile TV services. As it stands other sources of content will easily dislodge the practice of watching Mobile TV. Exclusive content was available to our study participants - 'City Hunter' (a short drama) but the volume was very limited. Paid services were tried but more often than not cancelled.

TV channels that broadcast games such as Star Craft are especially popular with the younger generation of South Koreans and were noted by users as popular content. The game channel is available in the current Mobile TV offering.

M3. "After buying this Mobile TV phone, I watched the game channel only through it. I stopped the subscription to a paid Internet game site."

It is possible for future mobile phone subscribers to adopt Mobile TV through their regular mobile phone replacement cycle - in effect costs may be hidden by being bundled with other services.

M4: “When I first got the phone, I even didn't know that I have to pay for the Mobile TV service every month.”

One participant (F2) had her parents pay for her subscription by persuading them that she would use it to access educational content.

4. USE CONTEXTS

The research team noted four main use contexts for Mobile TV: at home; during the evening commute; during macro breaks; and lastly secret use. We also note that the shared watching of Mobile TV content and lending the device for watching were not uncommon.

4.1 Home

Amongst our participants, home use was the most prevalent context for Mobile TV watching which is somewhat surprising given the alternative forms of entertainment that were available in the home.

Although larger televisions may be available in the home space participants had control over **what was watched** without the need to negotiate with other family members, this factor is also cited as a source of inter-family conflict by Bruckland [18].

M1. “... When my parents are in home, I cannot watch game channel from ordinary TV. They do not like me to watch it. This is the reason why I watch the game program on the mobile TV.”



Figure 4. Bedroom

Another explanation for home use is that the user can control **where content is watched**. Our participants mentioned watching from their bedroom suggesting that convenience (conducting other activities in the same space, having access to a power source), comfort (bed is usually comfortable) and privacy to being important part of the experience. These factors are amplified when the rest of the home is under the control of parents.

None of the participants in our study mentioned viewing very personal media and we note that the bedroom is also conducive to its use. Watching during bathing activities was also noted.

F3. “When I take my Korean steam bath every day, I watch Mobile TV because it makes time go faster.”

In addition to the above issues home use is somewhat different to other contexts in that it supports a variety of viewing styles – such as lean back, lean forward and ambient viewing.

4.2 Commuting

Mobile TV was used during the commute via bus and train (figure 5), in particular during the evenings. The need to maintain eye contact with the road restricted use whilst driving.

It should be noted however that experience of watching Mobile TV during the commute can vary considerably influenced by factors such as: the predictability of journey times; whether seating is available; the need to switch seats; whether morning

and evening commuting - morning tend to have more time constraints; the weather - holding a wet umbrella, or coping with condensation on the inside of windows; temperature - devices can get uncomfortably hot - a feature in colder climates; traffic and road conditions such as stopping, starting, negotiating potholes; lighting and noise conditions, particularly as people get on and off, plus the conductor announcements; and lastly the density of the commuting space and whether other passengers can see what is viewed.

F4: “When walking in the street, I usually listen to the radio channels.

But I usually watch mobile TV in a subway on the way to home”



Figure 5. Commuting

4.3 Micro and Macro Breaks

We use the term micro and macro breaks to refer to moments of time between planned activities and tasks such as waiting for traffic lights to change, for elevators to arrive, for friends to turn up, a few minutes at the end of a lunch break, and cigarette and toilet breaks.

We make the distinction between micro and macro breaks to draw reader's attention to the length of time required to setup Mobile TV. This includes the time it takes to select the first TV channel, for the device to obtain a reception for that channel, channel changing and subsequent delays between changes, and the need to locate and use a headset mean that Mobile TV is more suited to longer, that is, macro breaks.

Furthermore the user may be required to engage in other status information tasks during these breaks – including keeping an eye out for friends or the arrival of public transport.

4.4 Secret Use

Our younger participants (F2, M1) detailed situations where watching TV was not socially acceptable but was never-the-less carried out – situations we refer to as secret use. Secret use was carried out in the classroom during classes (hidden in pencil case), in the library and supposed to be doing homework.

We extrapolate from this that secret use is likely to extend to other contexts such as sitting through a boring meeting or conference paper presentation. Secret use may occur in any context where viewed content is not socially or legally acceptable (including during home, commuting or macro-breaks).

In societies with high theft risk such as the UK or Brazil, the user may also wish to minimize the visible exposure an expensive device. Also watching TV implies that less of the user's senses are devoted to watching over other valuables, thereby possibly putting other objects at a higher risk of theft.

4.5 Shared Mobile TV Viewing

Contrary to prior research reports our study participants mentioned a number of situations where Mobile TV viewing was shared for co-viewing. As M1 puts it:

“During the school lunch time I share my Mobile TV with friends, usually up to four people”

Involuntary or passive sharing is also possible - for example being overlooked by other passengers on a bus. Within our study sharing occurred amongst members of the same close social circle, but its possible that televised event such as sports are likely to be triggers for sharing with a broader range of people.

Shared use implies a close physical proximity – dictated by the size of the screen and the angle at which viewing is possible and this echoes similar findings from a Finnish study [1].

The need for close physical contact may support or hinder use depending on the context. A flirting couple might enjoy the need to brush up against one another, but rivalous siblings may not.

The shared experience may not include audio content if the context inhibits audio output. When a headset is required the opportunities for sharing are further restricted.

4.6 Lending Devices

Our participants also noted situations where devices were lent to others – for example to watch a particular sporting event or to have a trial on the Mobile TV feature.

M3: “Sometimes my sister borrows my phone to watches Mobile TV, but I have never watched it together with her as the LCD is too small to share”

Device lending is limited to even a closer social circle than shared viewing. Our findings show that device landing has a strong influence on Mobile TV penetration. Three users (F3, F4, and M3) claimed lending device enticed some people around them to purchase Mobile TV.

5. BARRIERS TO ADOPTION

5.1 Lack of Decent Content

None of participants in our study talked enthusiastically about Mobile TV contents and it is fair to say that content available to South Korean subscribers can be considered equivalent to the 3rd rate TV channels available via cable TV. Popular content from other TV channels were not available. However radio channels available through the same application were considered popular and widely used.

What makes content compelling is subjective, and in part down to alternatives sources of the same medium (downloaded TV programmes, terrestrial, cable & satellite TV, video rentals, video on demand,, etc) and alternative media (web access, newspapers, music, gaming, people, etc)

5.2 Battery Life

Watching Mobile TV is a significant drain the mobile phone’s battery. Whilst out and about the user may be forced to choose between viewing content and staying connected. If the phone is lent to someone else for viewing the borrower may have different priorities remaining battery life when the phone is returned.

Battery life is less of an issue in the home context where the device can either be docked in a charging cradle or connected to the nearest available power socket.

A number of our participants carried spare batteries, but their use is far from straight forward –spares need to be kept charged, if a

spare has been carried for a while, it is not clear how much charge remains, they need to be taken out to be charged and the user needs to remember to place the battery back in the bag.

Any assumptions about battery life needs to consider alternative charging options – for example public charging stations are widely available in convenience stores and carrier service centers in Seoul, and cars are considered a good place to keep mobile phone’s charged.

5.3 Phone Size

With the exception of the Samsung June SCH-v330 phone used by one participant the Mobile TV phones were considerably bulkier than more regular handsets on the market.

Prior research suggests that a majority of potential Mobile TV users are willing to compromise on phone size in order to have Mobile TV functionality [9]. However even if the relatively bulky device is carried the issue is where it is carried.



Figure 6 device supporting

Numerous research studies on where people carry phones suggest that women are far more likely to carry phones in bags, and men in front pockets [19]. The bulk of the current crop of devices is not well suited for pockets suggesting that men are more likely to have to switch to using bags.

The bulk of the device means that watching for longer period is not possible without being able to support the holding limbs.

5.4 Setup and Channel Changing Takes Time

Whilst the rapid changing of TV channels is desirable [6] the situation for our participants was far from perfect – and they complained that channel changing was too slow.

The initial selection of a TV channel from a menu could take up to a minute and during subsequent channel changes delays of up to 10 seconds were not uncommon (the technical quality of service is likely to vary considerably according to where the device is being watched – we did not comprehensively study the time it took to connect to different channels in different contexts).

5.5 Lack of Decent Reception

One of the problems encountered by our participants was lack of reception in buildings – perhaps a feature of being a satellite-based service. Whilst TU media has installed so-called "gap fillers" (micro base stations) in shadow areas to improve signal quality our study participants still complained of a lack of coverage without first plugging in a relatively bulky external antenna.

Whilst participants acknowledged that the antenna accessory improved signal quality, none carried the antenna outside the home – it was considered too bulky to take on the off-chance that Mobile TV would be watched and that reception improvement was required.

6. DISCUSSION

Whilst the results of the research study were well received by internal stakeholders in [ANONYMOUS] - it is worth noting the limitations of this study – the collection of qualitative data from 8 relatively early adopters of DMB Mobile TV services. With these limitations in mind the study did collect very rich qualitative data, including over 3900 photos, and achieved its original aims.

6.1 The Future of Mobile TV

Motivations and barriers to use

Most barriers to use Mobile TV will diminish over time as technologies evolve – device will be less bulky, battery life should be extended and alternate solutions such as significantly shortening recharging cycles will also evolve. Today the experience of watching a drama may be strongly affected by battery consumption concerns. And given the extra hassles of maintaining two batteries we propose offering one extended battery a preferred option.

We noted that in some instances it could take up to a minute to connect to a TV signal after having selecting a channel to watch. This may not be a big problem for macro breaks but on a micro-break someone is going to have to be pretty sure that the content is desirable to watch before taking the effort to switch on.

Compelling content

Lack of compelling content was mentioned as a big barrier. The question is what makes for a compelling Mobile TV experience? And does Mobile TV need compelling programmes to survive or even thrive?

One bench-mark for compelling content is whether it is a stimulus for water-cooler conversations. The quality of the programmes available via TU Media was described by a local member of the research team as 3rd rate programmes normally available on free cable channels. Even if unique content is available there is unlikely to be sufficient market penetration for it to be a topic of communication around the water cooler. At this point the Mobile TV device is more likely to be a conversation starter than its access to content. We surmise that to be a success Mobile TV will require both popular content from other medium and content generated specifically for this service.

Alternative forms of entertainment

As flash memory and hard disk capacities become cheaper and components smaller the ability to transfer content from other content stores e.g. PC will be in the hands of more people. That enlarges the electronic eco-system where the Mobile TV will be used. Whether Digital Rights Management tools will allow user's to transfer content of their choosing is a separate issue.

6.2 Ubiquitous Mobile TV Viewing

In house

A number of studies have shown it is relatively common to charge a mobile phone close to the bed [19, 20]. Satisfactory viewing of a Mobile TV screen may require a longer cable than if phone was being used for other tasks such as an alarm clock. Any charging indicator light should not be visible (or should be

muted) when the Mobile TV is on – to avoid visual interference with what is display on the screen.

Outside the home Mobile TV use was very much a lean forward experience. Leaning forward is driven by: the need to multi-task e.g. sending and reading text messages; channel switching (no remote controls were available); minimal screen size; the need to physically support the device; the need to maintain security of the device. There are opportunities for lean back use in the home – where the device is placed in a cradle and watched.

The variety of viewing postures and the need to find and maintain a good reception somewhere in a room suggests support for multiple viewing angles. The user might be working on other tasks or have access to various devices and service. Presence of the eco-system should be considered when designing Mobile TV.

Secret use may be better supported in Mobile TV design, for example, by making it less obvious that the user is interacting with phone. However, a possible consequence of this is that when Mobile TV functionality becomes more mainstream users may wish to highlight that they are not watching TV but are actually engaged in more 'productive' tasks.

Out and about

Prior research suggests that mobile phones are carried and often used from waking in the morning to going to bed at night and all situations in between [20]. Mobile TV can be watched when actively mobile – walking or moving around. But the small screen size makes most content too difficult to watch and the sensory engagement required to watch conflicts too much with the task of walking to be enjoyable.

On numerous occasions we've watched user's read and write text messaging whilst walking - often using a person walking in front as a 'shield'. What's the difference between text messaging and watching TV? For one the user is in control of what happens next - television programmes continue at their own pace regardless of what the user is doing.

Another reason is the weight and the bulk of the device – a posture for continued viewing whilst walking would require the phone to be held out arm slightly raised in front of the body. When all our participants demonstrated viewing postures all did so showing the device and holding arm supported by leaning on surfaces. An arm outstretched it simply too much of a strain [12].

Sharing & lending

Sharing can be facilitated by use of a remote control to maintain a degree of control and distance during the sharing experience; allowing the user to silo personal content on the device – perhaps disabling features when the device is in TV watching mode; applying battery limits so that the TV cannot be watched when the battery runs 'too low'.

A key consequence of sharing and lending is a loss of privacy [22]. If the owner is co-present, there is a small risk of privacy being violated - with the exception that others can see who the incoming communication is from. However if the device owner is not present there may be a perceived risk that personal information such as photos, text messages and web page favorites

6.3 Immersion vs. Distraction

Is it possible for Mobile TV to be a replacement for regular TV? Our study suggests that it will supplement regular TV viewing – with user's opting to retreat to a place of their choosing to watch their preferred content without having to first negotiate with others. But Mobile TV will not replace regular TV. These findings were also supported by VTT studies [1].

During the Seoul study we wondered whether an immersive experience was possible with Mobile TV, and if so, was it desirable? Our conclusion was that it is possible – 'all' it takes is wearing sound insulating headphones and a reasonably moderate storyline, and in all but a few contexts desirable if the duration of the immersion is accounted for.

Immersed watching experiences risk leading to: personal danger to the user e.g. risk of theft or and associated assault; minor inconveniences such as missing a bus stop; awkward transition between the immersed experience and the reality of the user's context in particular in public environments; losing the ability to use the phone as a communication device until it is next charged.

Factors counting against immersion occurring include: the time it takes to become immersed in a programme – suitable for longer time periods but not necessarily for micro or even macro breaks; the small screen making it difficult to catch details; audio is not always possible in each context; contextual distractions – noise, lighting, other people; device based interruptions, such as battery low warnings; poor quality reception; and the availability of content at that exact time.

Not all TV requires the user's undivided attention to be enjoyed and ambient watching. For example, with the volume turned down is possible both at work and at home. But something more immersive will be desirable when lying in the warmth of a bed. Generally content that overly engages the user for long periods of time is undesirable in many of the use cases.

Given our desire to offer the best possible user experience, how can we support immersion whilst keeping the user in control in these situations? One simple measure is the option to ensure the time is visible at all times. Another is to be able to prioritize device based interruptions – a user may want to know about a low battery warning but cares less for SMS notifications until after a programme has finished.

Both the pre-recording and pausing of content are desirable on mobile devices. The trigger for deciding what to watch could come at any time and the device should ideally support both content recording and notifications. Any time-shifting capabilities put the user in control of when content is watched even if the pausing content is limited to a few minutes.

6.4 Mobile TV vs. Mobile Phone

Devices capable of watching Mobile TV may also offer superior experiences for existing phone features. The relatively large display can be suitable for web browsing and viewing other image contents. A high quality speaker can enhance the experience of listening to music or the radio.

A device optimized for Mobile TV creates conflicts over existing features and usage patterns [23]. The occasional shared Mobile TV experience comes with an associated risk of revealing private

information. The display size currently makes it difficult to carry though with sufficiently compelling content optimized for that screen size users will put up with significantly larger devices. Long periods of use in public environments may increase the risk of theft of other objects.

In cultures where Mobile TV content is both unique and compelling it may be desirable to make that content available to a wider variety of people. Transferring contents to larger displays e.g. TV using a wired or wireless solution is possible.

The display size requirement may make enlarge the phone size and make it difficult to carry. The desire to use it in public spaces may increase the risk of theft of device or other carried objects.

6.5 Cultural Differences

Choi et al (2005) did a cultural influence research on mobile data service design. By comparing with Japanese and Fin, they found that Korea is a collectivism culture and proved that Korean are more likely to avoid uncertainty in using mobile data service [24].

In our study, we found TV sharing and device lending very common in Korea. That can be partially increased by collectivism culture. So we may not be expecting it happens so often in individualism cultures such as Finland or Japan.

Against the traditional theories, Choi et al found that Japanese, Korean, and Fins share the time perception: monochromic. That means people carry out one task at one time and proceed in a sequential manner [24]. That indicates that the Mobile TV Korea finding concerning multi-tasking and waiting time perception can be expatriated to all countries.

In addition, Mobile TV use is also strongly influenced by different apartment layout, public transportation penetration, and other differences present in different regions.

In cultures such as the US people are more likely to have a TV in their bedroom and in these instances Mobile TV will need to compete more directly with regular TV offerings. This is particularly important for younger users of Mobile TV services who may have less 'rights' or control over other spaces in the home.

Commuting habits also vary significantly between cultures – both in terms of the time it takes to commute, and the mode of transport. Approximately 75% of US commuting done in single occupancy cars so the opportunity to watch Mobile TV at this time will be considerably less that in Korea. That cars are considered a viable source to charge mobile devices enables longer viewing in other contexts.

7. CONCLUSION

One consequence of having TV functionality on a mobile phone is that the device may be considered by peers to be more of a tool for sharing than a personal communication device. Watching broadcast TV is non-exclusive activity – and (with the exception of battery use) having 1 or 3 people watching a programme makes no difference to the subscriber's cost. In this sense the mobile phone loses gains some of the characteristics of TV which in turn changes what it is as a device.

What does the future hold for Mobile TV? As with any service it depends on the user's expectation of what is encompassed by that service. If, as in South Korea, Mobile TV includes radio use then it is probably already considered a success.

One of the primary benefits of Mobile TV is that it provides the user with a choice of content in a setting of the user's choosing. These and related findings have led us to believe that Mobile TV is more about personal experiences, than the need for mobility itself. Therefore, we consider Personal TV to be a better descriptor of this service.

We note that personal experience is not necessarily solitary, and the fact that Mobile TV is consumed on a device with a myriad of communications options suggests a direction for further investigation.

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