

DMB-Project MI FRIENDS

**Results of the
Accompanying Field Study during the World
Cup in Munich 2006**



The European DMB-Project

**Performance by SOFI Göttingen
by Appointment of**

the Bayerischen Landeszentrale für neue Medien (BLM)

DMB-Project MI FRIENDS – Results of the Accompanying Field Study in Munich

European DMB-Project MI FRIENDS
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Preamble

In March, BLM initiated the DMB pilot project MI FRIENDS because it was evident to us that in future mobile communication will play an important part in the media industry as a result of digitisation – the term is an acronym derived from the words „**M**obiles **I**nteraktives **F**ernsehen, **R**adio, **I**nformation, **E**ntertainment und **N**eue **D**igitale **S**ervices“ (*Mobile Inter-active TV, Radio, Information, Entertainment and New Digital Services*): The technology applied, Digital Multimedia Broadcasting (DMB), is a further development of the digital sound broadcasting standard DAB. It was, and still is, the aim of MI FRIENDS to develop and to test contents for mobile end devices, to try out business models, and especially to investigate user acceptance. There are several project partners, such as, the Bayerische Rundfunk, Antenne Bayern as well as many medium-sized media companies who joined the project alongside the subprojects in Munich, Regensburg, Lake Constance, and South Tyrol. An important partner for MI FRIENDS is the Korean Ministry of Information and Communication (MIC) and the associated research institute ETRI which together with the Korean electronics corporation LG support the project in regard to the overall technical development and the development of the end devices.

MI FRIENDS' first subproject started in early June 2006 in the metropolitan area of Munich shortly before the FIFA World Cup and finished on August 31. Within the scope of the Munich project almost 200 mobile phones were handed out to test users. The focal point of interest was to find out how an event like the World Cup affects mobile use and in which way the users' behaviour changes when the event is over. The following is a documentation of the results of this supervised study.

MI FRIENDS is an applied research project within which the participating medium-sized companies especially collect new findings which help them to prepare for new or evolving markets. Normally, the local and regional broadcasting service providers do not have the funds to be able to enter into new areas of operation completely at their own risk, and this is why BLM sponsors this pilot project. We do realize that mobile broadcasting will not yield great profits right away. On the other hand, we are positive that this is an innovative business sector which has a promising future. In the first instance, the MI FRIENDS project serves to get our local and regional providers ready to deal with future developments and to face a market which is becoming increasingly competitive.



Prof. Dr. Wolf-Dieter Ring
President of the Bayerische Landeszentrale
für neue Medien (BLM)

MI FRIENDS Project Characteristics

Introduction

The growing mobility of the information society worldwide is bringing about new challenges in regard to adapting the conception and providing media and information services for mobile use. In order to achieve this, it is necessary to have an early inter-disciplinary cooperation between domestic and international companies in the broadcasting and telecommunication industry as well as research institutes.

For the purpose of mastering this task the European DMB¹ pilot project MI FRIENDS² was launched and developed, and was coordinated by the Bayerische Landeszentrale für neue Medien in accordance with article 30, Bavarian Media Law (BayMG). In November 2005 MI FRIENDS received the European CELTIC label, combined with the EUREKA signet. The European CELTIC Initiative³ supports comprehensive research and development projects in the telecommunications sector.

The purpose of the project, which is scheduled to run until the middle of 2008, is the development and testing of innovative mobile media offers in cooperation with the value chain of relevant media, starting with the development of contents and distribution up to the development of end devices. Here, the interest is focused on the individual as a media user within the local-regional area.

Being a European project, MI FRIENDS consists of an alliance of more than 70 designated project partners from nine countries headed by German companies and research institutes. Amongst the partners are traditional media companies such as public and private broadcasting service providers and publishing houses as well as medium-sized content and technology providing businesses. The overall project comprises four subprojects which are being conducted in Munich, Regensburg, at Lake Constance, and in South Tyrol.

A key issue of MI FRIENDS is the integration of medium-sized companies. There are two reasons for this: Firstly, being integrated in the forthcoming growth market of „mobile media services“ offers medium-sized businesses new opportunities in the media industry. Secondly, the integration and support of regional and local mobile media offers constitutes the greatest possible variety of offers on this new market and gives the small and medium sized companies permanent access to it.

¹ DMB – Digital Multimedia Broadcasting

² The term MI FRIENDS stands for Mobiles Interaktives Fernsehen, Radio, Information, Entertainment und Neue Digitale Services.

³ CELTIC is a EUREKA cluster project which was launched as early as in November 2003. CELTIC stands for 'Cooperation for a sustained European Leadership in Telecommunications'. The initiative is sponsored by the majority of the major European players in communications technology. The main objective of CELTIC is to keep up the European competitive capability in telecommunication by means of cooperative research and development.

Contents and Services

Main focus of the project is the design of radio and tv programmes which cater to the requirements of the users and at the same time are compatible with the individual end devices. Furthermore, it is a basic objective to develop new services which offer distinct added value to the user, like, for example, intelligent storage concepts which permit the automatic recording of program sections. Like this users have access at any time to contents of relevance to them. Also the results should be transferable to alternative transmission technologies (for example, DVB-H).

Technology

Basically, the pilot project does not favour any particular technology. However, a comparison of the digital broadcasting technologies shows a temporal advantage of the DMB technology which is based on the digital broadcasting standard DAB. Considering the present frequency situation especially the DAB frequencies in band III and L-band are currently available. At the same time, due to its wide range, the DAB network has the capacity to broadcast mobile services not only to high density areas.

Already there are several end devices available at short notice thanks to the commercial start of T-DMB in Korea in December 2005 and in Germany early in June 2006. While the basic technology exists, a great many features of practical implementation need to be revised. During the course of the project answers should be found to a variety of complex additional questions regarding interfaces, aggregation of contents, optimization, quality-of-service-tests, and possible additional inter-active options. Also, at a later stage additional broadcasting technologies like DVB-H will be integrated and the combination with mobile radiotelephone technologies like UMTS or GPRS in a terminal will be tested.

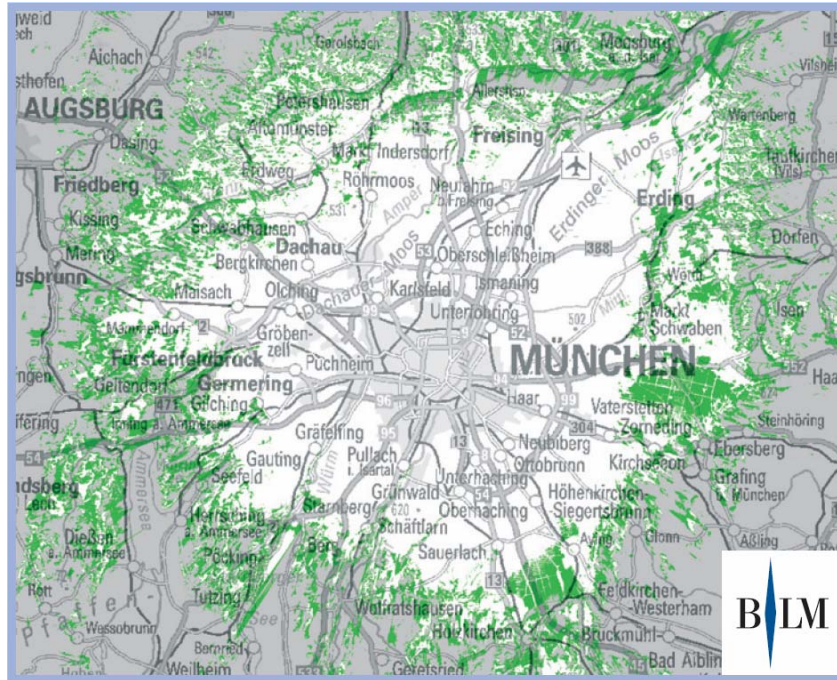
Economic Outlook

Starting with an analysis of the existing business models and value chains in the separate areas of broadcasting and telecommunication, new forms of cooperation between the partners will be worked out and tested. This includes the analysis of models which generate revenue, such as Pay-per-View or Pay-per-Channel, and the development and testing of innovative forms of advertising and inter-active services.

DMB-Project Munich

The Munich subproject of the European DBM project MI FRIENDS which had started shortly before the World Cup on June 7, 2006, was completed as scheduled on August 31 2006. Within the scope of the project six TV channels and two audio channels were broadcast in the metropolitan area of Munich for a period of three months.

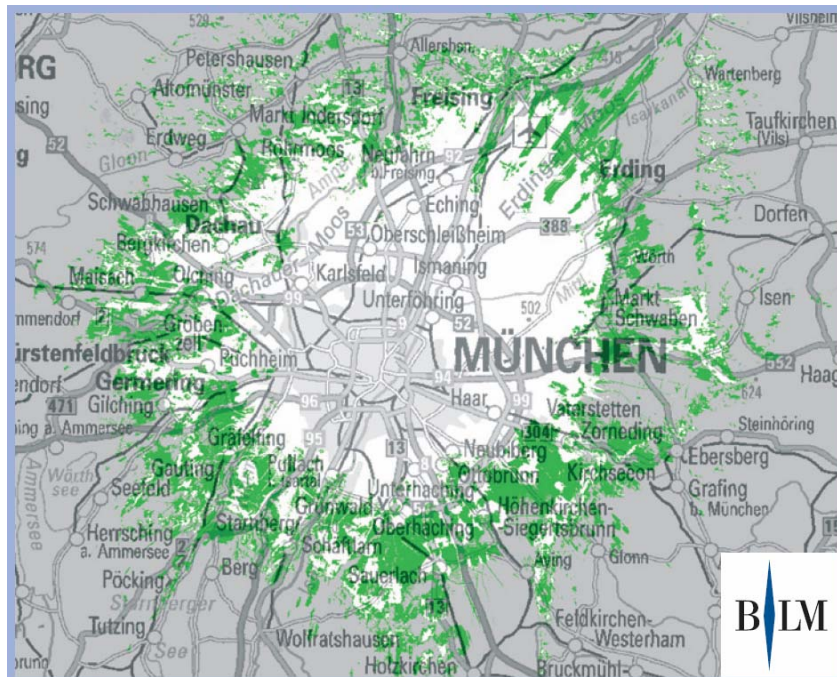
The video- and audio services in DAB/DMB standard were broadcast via channel 11D from the Olympiaturm location and via channel 12A from the locations Funkhaus Bayerischer Rundfunk and München-Freimann.



Picture: Band III / Block 11D „Olympiaturm“ Broadcasting Station

Picture: Likelihood of range „Portable Indoor“ after RRC04

Map provided by: © Bayerisches Landesvermessungsamt München 4059/03



Picture: Band III / Block 12A „Funkhaus BR“ and „München-Freimann“ Broadcasting Stations

Picture: Likelihood of range „Portable Indoor“ after RRC04

Map provided by: © Bayerisches Landesvermessungsamt München 4059/03

The programme providers of the Munich project were ANTENNE BAYERN, Bayerischer Rundfunk, Dienstleistungsgesellschaft der Bayerischen Lokalradioprogramme (BLR), Deutsches SportFernsehen (DSF), Das Erste, Focus TV, Deutsche Welle, münchen.tv,

Plazamedia TV & Film Produktion, NOVA RADIO, and talkSPORT, the British digital radio broadcasting station.

The two channels 11D and 12A were assigned to the programme providers as follows:

Programs on channel 11D accounted for by BLM:	
Sport and local (TV)	00:00 – 11:30 Uhr DSF (simultaneous)
	11:30 – 12:00 Uhr WM Special PLAZAMEDIA
	12:00 – 16:30 Uhr DSF (simultaneous)
	16:30 – 17:00 Uhr WM Spezial PLAZAMEDIA
	17:00 – 21:00 Uhr münchen.tv
	21:00 – 00:00 Uhr DSF (simultaneous)
MI FRIENDS Mix (TV)	Deutsche Welle, FOCUS TV, Antenne Bayern, NOVA Radio; loop system, one our each <i>Contents: Information, entertainment, service round the World Cup, health information, nightlife tips, and music</i>
WM Radio (Radio)	Offer by the service providing company of Bayerische Lokalradioprogramme (BLR) in cooperation with the local Munich broadcasting stations Radio Arabella, Radio Charivari, and Radio Gong 96,3 and the Münchener Abendzeitung. <i>Contents: News and entertaining information round the World Cup</i>
talkSPORT (Radio)	Simulcast transfer of the British Sporttalk broadcasting format
Programs on channel 12A accounted for by the BR:	
Das Erste (TV)	(simultaneous)
Bayerisches Fernsehen (TV)	(simultaneous)
BRpocket (TV)	A selection of program offers by the Bayerisches Fernsehen
Das Modul (Visual Radio)	BR's digital radio program with supplementary picture information

In addition the reception of the commercial „watcha“ program by MFD Mobiles Fernsehen Deutschland GmbH⁴ and the nationwide and local DAB programs⁵ receivable in Munich was offered.

Based on an April 2005 memorandum of understanding by the BLM and the Ministry of Information and Communication (MIC) of the Republic of Korea on the subject of sponsorship and cooperation in regard to DMB the Korean project partner LG and the Korean company of SK Telekom provided 400 test receivers for the start of the DMB project in Munich.



Foto: T-DMB-Phone LG V9000

On top of the mobile TV format the T-DMB - phone LG V9000 supports the mobile radiotelephone standards GSM, GPRS, and UMTS. The portable battery capacity permits up to 2 hours of TV reception on a 2.2" revolving colour display with a 240 x 320 pixel resolution.

To establish utilization and acceptance of the program offers transmitted via DMB, 190 test users were equipped with DMB mobile phones from early June until the end of July 2006. The user study was ordered by BLM and performed by the Soziologisches Forschungsinstitut Göttingen (SOFI).

Altogether the following partners were involved in the Munich DMB project:

ANTENNE BAYERN, Bayerische Landeszentrale für neue Medien (BLM), Bayerische Medien Technik GmbH (bmt), Bayerischer Rundfunk, Bayern Digital Radio GmbH, Dienstleistungsgesellschaft der Bayerischen Lokalradioprogramme (BLR), Deutsches SportFernsehen (DSF), Deutsche Welle, Electronics and Telecommunications Research Institute (ETRI), Factum Electronics AB, Focus TV, Institut für Rundfunktechnik GmbH (IRT), LG Electronics, Ministry of Information and Communication, Republic of Korea (MIC), münchen.tv, NOVA RADIO, onTimetek INC., Perstel Inc., PIXTREE Technologies, Plazamedia

⁴ N24 (TV), ZDF (TV), a music program developed in cooperation with MTV (TV), BigFM2see (Visual Radio); <http://www.watcha.de>

⁵ ROCK ANTENNE, Radio Galaxy, Fantasy Bayern, Deutschlandfunk, Deutschlandradio Kultur, Gong Mobil, NOVA RADIO, Digital Classix, Radio Deluxe, Bayern2Radio, Bayern 4, B5 aktuell, Bayern Mobil, Das Modul, BR Verkehr.

TV & Film Produktion, Satelli-LINE Infodienste GmbH, Soziologisches Forschungsinstitut Göttingen(SOFI), talkSPORT.

Purpose of the User Study on the European DMB Project MI FRIENDS

As follows from the project description the MI FRIENDS project is meant to be inter-disciplinarily orientated. By linking broadcast and telecommunication new mobile multi-media offers for local and regional use are developed and tested within the core of the project with the user being the focus of it all.

The necessity for User Driven Innovation

In the complex field of „Digitalisation of Broadcast“ new mobile broadcasting offers and services are a world-wide innovation which offer opportunities but also involve risks in respect of successful introduction onto the market. Technological innovation does not automatically mean success on the market. „75 percent of all launches developed following traditional patterns are commercial flops – often because they do not meet the requirements of the users“⁶. Vice versa some launches which are user driven are unexpected successes, such as, for example, the SMS services which originally were granted little chance of success on the market by manufacturers and experts. Being aware of the situation the MI FRIENDS projects strongly focus on user driven innovation. For this reason the user study plays an essential part in the project.

The fact that the innovation cycles keep growing shorter necessitates a large amount of information on the requirements of users which have to be aligned with the technical possibilities. The Munich DMB project user study attends to these information requirements and has submitted the first findings of value. Because of this it is an essential component for the development of a user driven innovation⁷.

From „Near to Market“ to „Fit for Market“

Right from the beginning MI FRIENDS was conceived deliberately as a „near to market“-project. For this reason it is an important challenge for MI FRIENDS to recognize technological and market related uncertainties already at an early stage, to analyse and to reduce them as much as possible⁸. This applies both to the contents and the terminals. In a case like this user research can provide useful results. Continuous user research offers a chance to analyse the conditions for a successful launch from the media users' point of view.

Approach to User Research in the Munich DMB Project

Bayerische Landeszentrale für neue Medien (BLM) as principal and SOFI Göttingen as consignee for this study consider the user research on hand on the Munich DMB project as an initial step towards the complex subject matter of user attitudes with mobile multi-media offers.

⁶ According to Prof. Dr. Eric von Hippel, MIT Sloan School of Management, Cambridge, from McKinsey Wissen 12/2005, S. 40ff.

⁷ Also see Frank T. Piller „User Innovation – Der Kunde kann's besser“ in „Die wunderbare Wissensvermehrung“ by Drossou, Krempf, Poltermann, Hannover 2006

⁸ dt.

Because of the special situation created by the 2006 World Cup, the user research concentrated on the subject of „mobile television“. Radio and new mobile multi-media offers were examined in detail during the second step only. Future research will focus rather on these offers.

The BLM considers the „early adopter“- i.e. „lead user“-approach an appropriate measure to gain further knowledge about the use of mobile multi-media offers. Especially the selected group of 190 test participants with their high technology affinity and the strongly developed information activities appears to be the most suitable for the development of user research. After all, early adopters and lead users feel a stronger desire for innovations and usually are ahead of the market trend. This proves to be helpful especially with a near-to-market project like MI FRIENDS and further to the assessment and preparation of the opening up of new markets in the years to come.

This MI FRIENDS-Munich user study is an initial assessment of the current „mobile broadcasting“ situation which is purposely presented in a descriptive way. In the sense of a case study the results will permit first conclusions and will initiate further questions. However, due to the type of random sample selected which did not intend to represent the population the findings may not be generalized, also at this stage such a generalization would be premature. At the same time the findings and evaluations will be important stimuli for further research on MI FRIENDS subprojects. On top of this the findings will provide valuable information on the way to a user-friendly medium in regard to the technology applied and the contents to be developed.

Summary and Perspectives

With this user study on the Munich DMB project BLM sees itself as being on the right path to deal step by step with matters regarding the successful launching of new mobile broadcasting offers. This approach corresponds to the intention of Article 30 of the Bavarian Media Law (BayMG) on the performance of pilot projects and operational experiments in regard to the development and testing of new programme offers and media services.

From BLM's point of view the knowledge acquired is promising and a way to success for the entire project. In addition „watcha“, the offer by MFD Mobiles Fernsehen Deutschland GmbH which is already on the market may provide useful ideas for a future-oriented further development. Based on these results supplementary research issues may develop during the next few months for further investigation.

After further investigations have been made and the results were implemented there is a possibility to acquire comprehensive empirically founded knowledge on „mobile media“ within the local-regional area. Due to their composition and structure the subprojects of MI FRIENDS may possibly be transferred to other European regions, too. This might result in a successful launch. BLM will further follow the path and extend the efforts of creating a user driven innovation within the scope of the MI FRIENDS project.

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Executive Summary

The MI FRIENDS mobile broadcasting offer launched during the 2006 World Cup was tested by 190 participants for a period of 8 weeks. The transmission range covered the metropolitan area of Munich, the offer consisted of a large selection of programmes including the wide-ranging public stations (das Erste, ZDF), two large private category programs (N24, MTV), plus the MI FRIENDS program offer which is still in an experimental stage. All participants were supplied with a TV-competent – then prototype - mobile phone. The first four weeks were influenced by the World Cup as a media event. This special had finished during the second phase, also the interest in the innovative technology vanished; in fact, the situation was back to normal. Consequently the design of the study permits a comparison of use in different circumstances.

The participants in the pilot project were recruited by means of an advertising campaign in Munich during the three-week period prior to the start of the World Cup.⁹ They were selected out of a pool of applicants in accordance with socio-demographic characteristics. The sample does not represent the whole of the population but reproduces a typical target group of mobile TV services in this early stage of their introduction. A test-related limitation applies to young persons under the age of 18 who did not qualify for legal reasons¹⁰. Two thirds of the participants recruited proved to be particularly interested in technology, they have an A-level education and a full-time job; 40% are apprentices or go to university. The average age of the participants was 30. Most of them were out of their homes a lot, i.e. they had less time than average to watch television.

Overall Analysis and Intention of Use

- From the test participants' point of view TV for mobile phones is an attractive service. Three factors are responsible for this positive rating:
 - Surprisingly good presentation quality, i.e. display and transmission qualities;
 - simple handling by pressing buttons, an easy, fast and direct way of tuning into the program;
 - availability of known TV programs, established TV brands as a basic offer;
- The basic acceptance of mobile TV is limited by the test-related coverage and the choice of terminal:
 - 70% of the participants could not watch TV in all the places they would have liked to. Most of all these limitations occurred at locations, i.e. in situations on the move: during daily underground transfer, during train rides, while travelling out of Munich and in some city (centre) buildings. These limitations apply to situations which are judged particularly suited for mobile TV viewing. As a consequence the limited range has a negative effect on the use and the intended use of the service in the future.
 - More than 50% of the participants preferred to use their own mobile phone for the non-TV functions than the TC-compatible terminal because the test

⁹ Surely the three weeks of advertising were short, but the limited time frame was a result of problems with providing/making available 200 DMB-compatible mobile phones which comply with the German standards. This was possible only three weeks before the start of the project.

¹⁰ The participants were liable for the mobile phone which was still a prototype at the time.

unit did not meet their other requirements regarding design and functionality (brand affinity). Towards the end of the test they hardly watched TV on the mobile phone because often they do not carry the second mobile phone with them and did not want to make the effort of changing the SIM card from one phone to the other.

- To the majority of the participants mobile television is no more than an add-on feature. At the end of the test this service had become more important to those participants who could be regarded as regular users and who had developed specific utilization patterns and –habits during the course of the test.

Outlook: A larger transmission area and a better choice of TV-compatible mobile phones would give the use and especially the intention to in future use the service a great boost.

User Locations and Situations

- Mobile television was used predominantly away from home. Most of all the participants used the mobile TV-phone while travelling by bus, by city train or by underground, at bus stops or train stations during the respective waiting periods – i.e. especially during their daily commuting. Train rides and longer travelling periods are at the top of the wish list because the limited transmission area did not allow for reception outside of the cosmopolitan area.
- For watching TV on the mobile phone is concerned, irrespective of the location all situations during the course of the day were important where no other tasks required attendance, for example, while waiting for something or while taking a break. For the first time it was possible to watch TV independent of the actual location. Particularly during the World Cup the participants used the mobile TV phone because they did not want to miss a game. Independent of such media events there were gaps in the daily schedule which were suitable for watching TV, this being a major incentive.
- Use during leisure time the service was attractive also; for example, while being outdoors while the weather was nice but not wanting to miss certain programs or wanting some extra entertainment.
- The workplace or university are important locations for regular use; however, in comparison to use on the move it was not mentioned half as often as commuting or waiting.
- On average there was less mobile TV viewing at home than at work. During the test period, whilst at home the mobile phone was used mostly outdoors. Additional reasons for its use did not want to disturb the other people living in the apartment or that the stationary TV was being viewed by someone else.
 - Use in a bar or restaurant was rare during the post-World-Cup test phase.
 - To watch TV on the mobile phone in public was not accepted easily once the World Cup was over. One had to use headphones, and some users felt that they took some getting used to.
- The end-of-test review of the daily schedule shows that during the eight weeks of testing about one third of the participants had developed regular user patterns and habits:

- The first peak user time was in the morning between 7 and 9 o'clock predominantly watching the news while commuting.
- Mornings and afternoons use took place mostly at work/at university („break“-peaks) watching the latest information, followed by some music videos.
- In the afternoon and early evening on the way home use was more frequent, watching the early evening soaps as well as the news.
- The evening peak times were during the news programmes when the participants who were not home yet watched on the mobile phone. Later they might watch a limited number of informative programs.

Usage Time

- The length of time spent watching mobile TV in both test phases was under half an hour a day and so clearly below the average time spent watching TV on a stationary set. The average usage time was subject to (further) wide variations:
 - During the World Cup the participants spent on average 25 minutes watching TV on their mobiles; 50% for up to a quarter of an hour, 25% up to half an hour; the remaining 25% longer than half an hour
 - At the end of the test the participants spent on average just under 10 minutes watching TV; only 15% of all participants watched TV for longer than a quarter of an hour
 - At the end of the test regular users with a high expectation for usage continue to watch TV for a longer period, on average just under 15 minutes.
- Depending on regularity of use and/or how habits affecting daily usage develop:
 - At the end of the test (after eight weeks) regular users spent 15 minutes each day watching mobile TV.
 - At the end of the test infrequent users spent on average only 5 minutes each day watching mobile TV.

Information on regular user behaviour and therefore over longer periods of time is needed to be able to formulate any comments about average daily use. We cannot make any statements from our study (as is presumably the case overall during the current development phase). The average values given above are therefore only a rough indication.

Frequency of Use

Frequency of use as opposed to usage time is an indicator of the scope and intensity of use.

- During the World Cup phase almost all the participants watched TV on their mobile phones, two thirds watched mobile TV daily.
- Immediately after the World Cup 85% of the participants continued watching mobile TV at least on a weekly basis, 26% used it daily.
- At the end of the test 54% of the participants watched mobile TV at least on a weekly basis, 11% daily. The sample group fell into two halves: regular users with a high expectation for usage and infrequent or non-users with less inclination for mobile TV usage.
- At the end 30% of the regular users watched TV daily.

Duration of Discreet Periods of Use

The duration of discreet periods of use is an important indicator for the type of mobile reception, as well as content design and broadcasting formats, etc.

- Discreet periods of use are short and rarely longer than 15 minutes. Length of time depends on the situation, i.e. a change in circumstances for watching TV during the course of the day.
- With regular use after several weeks there is a tendency for the periods to become longer, although only with a small participant group and longer than 15 minutes.
- Differences in duration of use depend on the level of interest in programme content, whether the viewer needs to concentrate or can be doing other things, whether to keep up-to-date with current events or for light entertainment. Periods of use are longer if the participant has a special interest in the topic, if it is light entertainment or as an accompaniment to other activities.

Conclusion: Mobile reception differs greatly from traditional TV reception.

Outlook: Periods of use that are short because of the situation are likely to remain so in the future. At the same time improvements to the service could contribute to longer periods of use, e.g. wider reception range, more light entertainment, specific adaptations to match the formats and design with mobile reception, easier use for watching mobile TV while doing other things.

Main Use of Mobile TV as an Up-to-Date Information Medium

- Up-to-date news and current affairs programmes dominate mobile TV use:
 - During the World Cup over 80% of the participants regularly watched both news and sports programmes; at the end of the test 57% of the participants continued to watch news programmes and 33% sports programmes.
 - The main reason participants had for watching mobile TV was “to keep up-to-date with current events” (91% during the World Cup phase and 71% at the end); the news broadcaster N24 was frequently used at a disproportionately high level.
 - Mobile TV use throughout the day is characterised by main news bulletins and magazine programmes. In the morning and around lunchtime mobile TV use is concentrated on the latest news events and supplemented with music; in the afternoons and evenings the main news bulletins are watched in addition to documentaries and light entertainment.
 - The formats adopted by news and current affairs programmes are particularly favourable for short periods of use throughout the day: the contents of individual sequences are short, not interrelated, are spoken (i.e. can be followed just by listening), conform to a familiar broadcasting structure, are easy and quick to navigate around and where important information is repeated. All these characteristics make mobile TV easy to use and add strength to establishing its position as an up-to-date information medium.
 - The emphasis on news and information on mobile TV was not restricted to the World Cup phase but was also characteristic of the weeks following the tournament, as well as corresponding with the participants’ expectations in the questionnaire before the test. News and information therefore stand in

contrast to the participants' "normal" TV use in which light entertainment plays an important part. This indicates that the emphasis on watching news and information programmes on the mobile was not due to the heavy presence of this type of programme, although its presence did reinforce news and information as a viewing preference.

Selective use of Light Entertainment Programmes

Light entertainment programmes were selectively used: at the top of the list came music; fictional programmes were concentrated on (early evening) TV series, here it is important to take into account the limited offer for light entertainment programmes under the test conditions.

- A third of the participants regularly watched music programmes in both test phases, almost double compared with TV viewing at home, at the same time music and radio were the most important forms of media use throughout the day. Increased use of music programmes on the mobile phone is therefore not linked with traditional TV viewing but more with the various forms of radio and music reception.
 - Watching music on the mobile was found to be a pleasant and suitable form of entertainment because of its flexibility. The special interest channel (MTV), which broadcasts uninterrupted music video clips, was frequently watched in the test.
 - The daily logs reveal that watching music throughout the day acted as background accompaniment. This was to increase in importance towards the end of the test (the same also applied to listening to the radio on the mobile).
 - TV music, like radio, was frequently used as background entertainment during the daily commute or at the workplace or university. Watching TV on a mobile as background accompaniment to other activities is however difficult: antenna problems; the device cannot be fixed or realigned.
- TV series were the most watched fictional programmes.
 - However, fewer than 10% of the participants said that they watch TV series on a regular basis.
 - TV series as opposed to feature films were found to be suitable for mobile TV. They are short and in principle the viewer knows what is happening – viewers can tune in and quickly follow the action, in a certain sense they are also "up-to-date" programmes.
 - The daily logs reveal that a specific group of regular users of mobile TV were extremely frequent viewers of early evening TV series, which at this period of the day were not an insignificant share of usage time; early evening TV series are broadcast when many participants were on their way home.
 - Many light entertainment formats adapted for "normal" TV programmes are less suitable for mobile use; this is particularly the case with feature films and programme content requiring a longer time span and high visual attention.
- The light entertainment offer in the test was limited and the majority of the participants missed out on the large private broadcasters. It may be assumed that a better offer adapted to meet the interests of mobile target

groups would lead to greater use of light entertainment programmes during the day. Whether this would remove the main use of mobile TV as a news and information medium is an open question.

- In the first phase a good third of participants named entertainment and relaxation as reasons for using mobile TV; in the second phase it was a quarter of all participants, although among regular users it was a third. Entertainment gains in importance with regular use.
- “Whiling away the time” was a main reason for using mobile TV and this corresponds with usage time during waiting periods. Here the contrast with stationary TV use is clear since whiling away the time at home by watching TV plays virtually no part for the participants.
- In terms of content, mobile TV concentrates on established TV programmes; news and current affairs formats are particularly suitable for mobile TV. Light entertainment programmes were used less; some light entertainments formats are in a tense relationship with the various types of mobile reception.

Up-to-date news and information serve to validate the benefits of this electronic medium and the current availability of the end device. Use is similar to that of the radio but with the additional feature of picture/film; use is also similar to that of web TV but with the advantage of being quicker and easier to use plus a recognized quality that consumers can rely upon while on the move.

Radio use

Irrespective of the test offer, listening to the radio during the day and while travelling represented one of the most significant forms of media use among the participants. Over half therefore made more or less regular use of the radio offer on the mobile TV. Approximately 22% said that they definitely wanted to listen to the radio on their mobiles in the future and a further 47% said that they might want to. However, mobile radio use was concentrated around current DAB radio offers. The DMB radio offer had little impact on participants; there were also additional and extensive problems with reception and only a small number of participants were actually able to test DMB.

Intentions for Use and Willingness to Pay

- Half of the test participants said that they would continue to use mobile TV after the test.
- As expected, the willingness of the participants to sign up to a TV service at the end of the test depended on their experiences. During the World Cup three quarters of the participants wanted to continue using the service after the end of the test (25% said they definitely would and 52% said it would be a possibility). However, at the end of the test these figures had halved to 12% and 37% respectively.
- Many participants were still undecided and wanted to make their decision based on further improvements to the offer:
 1. wider coverage and improved reception quality,
 2. affordable mobile TV
 3. better mobile TV
 4. better program offer

- Almost all participants were prepared to buy a TV compatible mobile phone at an average price of EUR 50.
- 80% of participants said they would be prepared to pay extra monthly charges for the service. However, the majority of the participants did not want to see the monthly charge exceed EUR 5. Even during the World Cup phase only 25% said they would be prepared to exceed this amount. Neither did the participants want to see a significant increase in this monthly EUR 5 threshold even with an increase in the number of programmes available.

Content and Service Development

- The desire for new contents and services in mobile TV grows out of the experience gained in the specifics of mobile TV reception, which lead to a tense relationship between traditional TV programmes and mobile user behaviour. The development in various types of mobile reception will lead to new requirements in technical features and content. But this also means that new contents and services in mobile TV cannot be easily anticipated, even by well-informed and technically aware participants who must still be able to try out these contents and services.
- In terms of programme offer, the participants look to the established TV broadcasters first and foremost and would like to see their services expanded. Adapting the programme offer in terms of the daily schedule to the interests of the new target group would, however, be important. In addition, more than half of the participants would like to see an additional news and information content on offer. Additional news and information using videotext as a model was high on the list; in other words additional programme related or in-depth information downloadable on demand.
- In terms of new technical features, interest is directed predominantly at opportunities to store programmes on the user's end device and to download time delayed programmes (VCR functionality). The background to this is based on the experience that individual time-play-spaces for mobile TV use throughout the day frequently do not fit in well with the fixed broadcasting times of TV programmes. Storage functions would significantly increase time flexibility. Opportunities for personalised storage of specific contents (tagging) would certainly be a sought after feature.

The results of the user research and investigation in the Munich-based MI FRIENDS project prove that in principle mobile TV is already an attractive service. The study findings prove that specific types of mobile TV reception are developing, which will however require further development in offers for mobile communication services so that mobile TV may possibly be developed into a mass medium comparable to the stationary TV set and the radio.

Introduction

The spread of offers for mobile communication systems on mobile phones in Germany began with the 2006 FIFA World Cup, albeit with limited reception and user numbers. Several pilot projects in four venues took place during the World Cup, the largest project including 400 users and conducted over more than two months by MI FRIENDS, Munich. The first MFD commercial offer began shortly before the World Cup in five towns and cities. The situation was similar in other European countries (DocuWatch 03/2006, Media Perspektiven 11/2006, bmcoforum 2006).

Characteristic of this early stage of development is the fact that little is known about how mobile TV is actually used on a day-to-day basis or the kind of offers potential customers would like to see, including programme content and additional services, such as electronic programme guide (EPG) or personal storage possibilities for delayed reception (tagging). The results from earlier studies investigating mobile TV usage reveal contradictory findings. In the individual studies carried out, mobile TV use is influenced on the one hand by a restricted range as result of test conditions, limited programme offers and end devices. On the other hand fundamental characteristics of use are heavily contested, e.g. whether mobile TV is predominantly used throughout the day while on the move, or perhaps when the user is not on the move but still makes use of mobile TV at home, in the evening, and during leisure time. All studies report clearly shorter periods of time spent watching mobile TV compared with watching television on a stationary set. The possible consequences of shorter usage periods (e.g. for programming) are, however, hotly debated. For programme makers this debate raises the crucial issue of whether traditional TV programming can be transferred to mobile services on a one-to-one basis or whether special formats for mobile reception need to be developed and adapted to the small mobile screens and shorter periods of use. The fact that mobile TV use has been characterised by limited offers and those user groups unfazed by technology seems to add plausibility to the argument that mobile TV use as witnessed to date may not be a strong indicator in terms of predicting future use.

The following study does not claim to provide definitive answers to the issues raised. Reliable predictions are still not possible. Firstly, the development of mobile communication systems offers has only just started and secondly, users need time to try out the new possibilities in their daily lives and to develop user habits. What does seem certain is that traditional TV use cannot be directly transferred to the mobile phone. Watching TV on a mobile phone is a completely new experience for users. In all cases the TV programme seen on the small display screen appears quite different, even if the programme is the same one as seen on a stationary TV set. Furthermore, the external ramifications, situations of use and times of day are unusual in many cases.

The user study in Munich focused on an empirical investigation of user behaviour. The use of mobile TV and radio services by 190 test users over a period of eight weeks will be described as accurately as possible and will include an analysis of user experiences, a record of their assessment and comments, as well as bringing their requests and suggestions to the attention of mobile communication systems service providers. The aim of the study was

not that of providing market forecasts but empirical results to be used in the development of mobile communication systems and their services.

The user study was carried out within the framework of the MI FRIENDS project association in close collaboration with project partners. This included an exchange of interim findings and feedback from questions throughout the study. This context and active support provided by the project partners enabled a very intensive investigation of and research into user behaviour. We would like to thank the commissioning body and all project partners. Particular thanks must go to Peter Kettner, who initiated the project and was its driving force, Andreas Klein who provided not only strong organisational assistance but also helped in the design of the study, the development of questionnaire instruments and ongoing discussions to evaluate findings and results, and lastly Walter Möller, Project Manager, and Reiner Müller, Technical Manager at BLM.

Report Structure

The report is divided into nine sections and begins with a presentation of the study design method and the investigative steps adopted. The second section will describe the sample group of participants and present their expectations of mobile TV before the test. The actual use of the mobile TV offer in both phases of the test will be investigated in sections four and five: section four will look at the first test phase during the World Cup. The assumption was confirmed that any possibility to watch TV intensively and at any time during the World Cup. The results of the test phase will be collated at the end of this section to discover what can be learned from the World Cup effect for the future design of mobile communication systems and offers. Section five will investigate mobile TV use in the second test phase after the World Cup. „Normal“ conditions reveal that usage does not depend on the quality of the offer alone but is also heavily determined by the way in which participants organise their daily lives. Watching TV on a mobile phone within the context of everyday life either enhances daily routine or otherwise occurs only on the rare occasion. The sample group of participants in the second test phase was divided into two equal groups: regular users and infrequent or non-users. In section six we will describe what factors determine continued use of the mobile phone for watching TV in the second phase and how it is used. The results from the daily logs linked to this area will also be presented. The use of DMB and DAB radio offers in conjunction with mobile phones will be presented in section seven. Section eight will consider the type of features that participants would like to have available and issues connected with programme offers will also be raised for discussion. Section nine will present the results of how the participants intended to use mobile TV and the improvements they would like to see made.

1. Study Method and Implementation

The study design was based on a usage test carried out over a number of weeks. Mobile TV and radio services offered as part of the Munich-based MI FRIENDS sub-project were the items tested. The aim of the accompanying user test research investigation is to offer a description of the participants' personal experiences and an investigation of their service requirements for user-based development.

A central design element was timing. The test started with the 2006 FIFA World Cup and ended roughly three weeks after the tournament. We made the assumption that the World Cup as a media event would increase mobile TV and radio use, as it would TV and radio use overall¹¹. We wanted to make use of this additional incentive, firstly to recruit an interested and possibly diverse test sample and secondly to use the World Cup effect to proceed to an adoption process. We feel that we were successful on both counts. The study design meant that a comparison could be drawn between the first test phase where usage was extremely intensive and a "more normal" second phase following the World Cup. At the same time a preliminary outline of regular mobile TV use could be captured during the eight-week period of investigation.

200 DMB-compatible mobiles were available and were distributed among participants for the duration of the test. These mobile phones were not yet available on the market and were particularly attractive to users with a technical interest in the use of mobile communication systems. Participants were provided free of charge with an all-inclusive service package, including end devices, under the proviso that the device would be returned. Participants were legally obliged to be over the age of 18 to take part in the test. Although under-18s are undoubtedly an important target group for mobile TV and radio services, this group could not be considered under test conditions. The test participants were not designed to be a representative sample of the population but were selected from over 500 applicants based on socio-demographic markers. Participants were intended to represent the broadest possible range of potential customers at the start phase of the service (early adopter). Roughly 500 applications were received following active marketing campaigns. Given the framework conditions, the timeframe for recruitment was very tight and had to take place within two weeks to ensure that the test start date would coincide with the opening of the 2006 FIFA World Cup. That this was achieved was undoubtedly due to the fact that there was widespread interest in mobile TV at the forefront of the World Cup. Despite the time pressure, various strategies were adopted in order to recruit the widest possible test sample group, including mailing lists; word-of-mouth advertising, contacts from participants already recruited (multipliers), recruitment campaigns at various workplaces, and flyers distributed in Munich city centre. Test participants were selected from among the applicants on the basis of age, gender, profession, and technical know-how, with the aim of achieving the widest possible distribution. The core members of the sample group (approx. two thirds) comprised young professionals and students with a level of technical prowess. These people correspond to early adopter types and represent an important target group in

¹¹ cf. Geese/Zeughardt/ Heinz (2006), Gerhard (2006), Mai (2006).

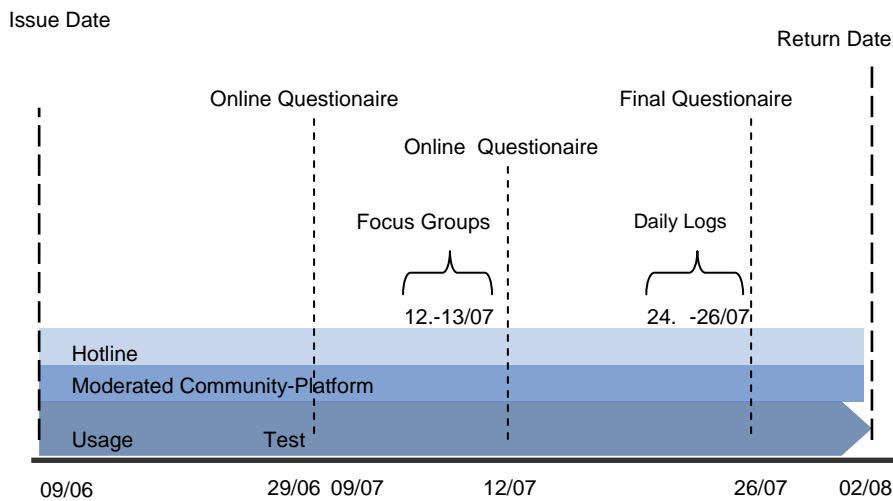
the start phase. A third of the sample group comprised older participants with less technical prowess (see section 2 for a description of the sample group).

During the eight-week period of the study, participants tested mobile TV intensively and took part in a number of questionnaires and interviews. Their experiences and evaluation of the offer during the test phase were recorded in four questionnaire waves, numerous interviews, and focus group discussions. The questionnaires focused on the users' expectations of mobile (DMB) communication systems services using mobile phones, actual use during the test period, an evaluation of the offer, and intentions for future use. The results are expected to provide information on the requirements relating to technical infrastructure, end devices, service features and programme offer.

Active participation by the sample group in the test itself, as well as responding to successive questionnaires, was crucial for the successful implementation of this user research investigation, which lasted a number of weeks. Communicating intensively with the participants was therefore a vital design element of the study. This included distributing mobile phones to participants individually and instructing them in how to use the device, regular e-mails and interviews, plus a telephone hotline and online forum.

The following is a chronological overview of the study, showing each phase of the investigation:

Chart 1: Study Timeline



The initial questionnaire was taken at the same time as the mobile phones were distributed and before participants had had a chance of gathering personal experiences. This questionnaire collected socio-demographic information, details of general media and mobile communication systems use and what the participants expected from the new service. The questions relating to participant expectations were designed in such a way that comparisons could be made with the experiences of actual usage later in the test. This would then allow us to compare expectations with actual experiences.

The first questionnaire during the test was conducted after a three-week test phase and was completed online. The questionnaire focused on intensity of use, reasons for use, situations of use, features used and other features

participants would like to see available, as well as intentions for future use and willingness to pay. These aspects were extended with a series of open questions in which the participants were able to record their experiences, assessments and comments freely. Participants made extensive use in answering these open questions.

The second questionnaire was conducted after five weeks of testing with emphasis on radio use and a few questions on TV use at the end of the World Cup. Both the third questionnaire and the final questionnaire were also conducted online. The response rate was very high, particularly with regard to the open questions and this in itself can be traced back to the fact that the test participants are predominantly skilled internet users.

The questions as described above were repeated in the final questionnaire, which was extended with questions about the participants' expectations and conditions for future use. The return rate for all questionnaires was over 90%.

Some participants had to end the test early either because their device was faulty or because they were no longer residing in Munich (e.g. holidays and business trips).

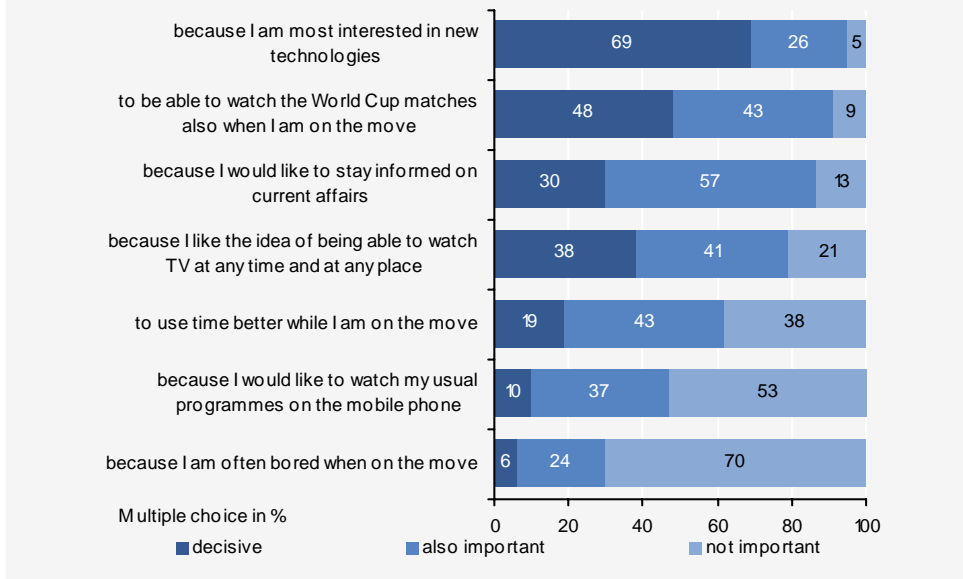
In addition to the four questionnaires, nine focus group discussions with a total of 65 participants took place during the second half of the test period. These discussions were documented and evaluated. The participants also kept a daily log over three days during the last week of testing. 71 daily logs were suitable for evaluation¹².

2. The Sample Group

Interest in mobile TV in Germany before the World Cup and clearly before the test participants had been recruited was very large. The activities of the various DMB and DVB-HD groups had also contributed to this interest. In particular, many fans of the World Cup would have been interested in the prospect of following every match on a mobile phone if there were no other opportunities available for watching the games. Participants for the test were selected on the basis of socio-demographic markers from the 500 applications received. The participants did not represent an average sample of the population but instead were a core group of people currently interested in this particular service and therefore potential customers at this phase. Those interested in mobile TV bore specific characteristics that we would like to illustrate as follows: their interest in the test was based on a general interest in new mobile communication systems and media technology, as well as the World Cup. The participants were attracted by the idea of being able to watch TV whenever and wherever and not purely because of the World Cup, but from the notion of being able to keep up-to-date with current events at any time. In characterising the sample group it was important that 70% of the participants had an interest in new technologies and services before any specific interest in mobile TV and/or the World Cup (chart 2).

¹² Logs not suitable for evaluation were those where no test use took place on the relevant days.

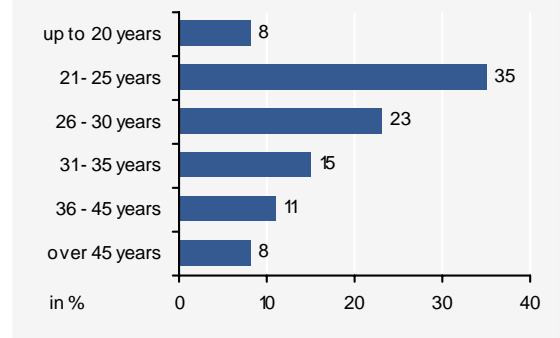
Chart 2: "What was the deciding factor that made you want to take part in this test?" (n=182)



The particular situation before the World Cup made it possible to recruit an early adopter sample group covering a comparatively wide socio-demographic spectrum.

The average age of participants was 30. The youngest participant at the time of the test was 18 and the oldest was 62. The 21-30 age group accounted for 58% of the participants and represented the main group within the test sample. The 31-45 age group and the over-45s represented 26% and 8% respectively (chart 3). Participants under the age of 20 and those over the age of 45 are clearly under-represented, each with an 8% share of the age distribution. The younger age cohort was excluded because of the framework conditions of the test, which required participants to

Chart 3: Age groups of participants



assume liability for the hire and return of the mobile phone. For insurance purposes, this condition could not be amended for under-18s.

40% of the participants were women and 60% men. Gender was a main selection criterion. Only in this way was it possible to achieve a favourable gender ratio for this type of test. It must also be noted that although the women in our sample group (according to our own data) were somewhat less technically astute than the men, their technical know-how was still greater than that of the female average in general. The same also applied to the older test participants.

2. The Sample Group

According to our experience, the failure to bring new technologies outside the realm of early adopter groups despite all efforts applies to early diffusion of new technologies in general and must therefore be taken into account in evaluating studies among early adopter groups.

The overwhelming majority of test participants were highly educated and this is also consistent with early adopters. 45% were university graduates, 24% had the higher secondary level *Abitur* qualification (presumably many still studying) and 13% were graduates from technical universities. Approximately 12% had a qualification from a secondary intermediate school and 2% had attained the school-leaving certificate (chart 4).

This high level of education is reflected in terms of professional status: 37% of the participants were white-collar employees and 6% of whom filled scientific/technical roles. 31% were students, 18% self-employed or in management positions and 8% were at school or on work placement schemes (chart 5). The majority of participants were heavily involved in professional and/or educational development. Their interest in mobile TV was a result of the fact that they are frequently on the move and do not (or cannot) watch a lot of TV at home during the week.

In terms of income distribution, we were able to achieve a wide spectrum. 17% of the participants had a personal monthly net income of EUR 500, 21% up to EUR 1,000 and 22% up to EUR 2,000. The higher income groups were comparably well represented with 18% of the participants earning up to EUR 3,000. 12% of the participants had a monthly net income in excess of EUR 3,000 (chart 6).

Chart 4: Education of participants (n= 187)

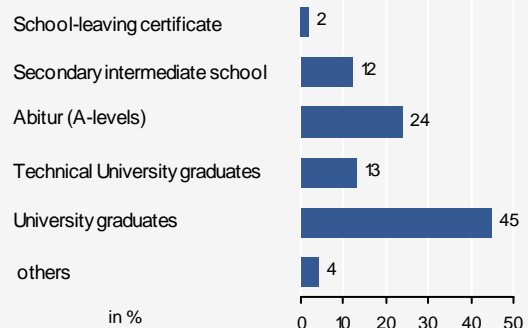


Chart 5: Professional status of participants (n=187)

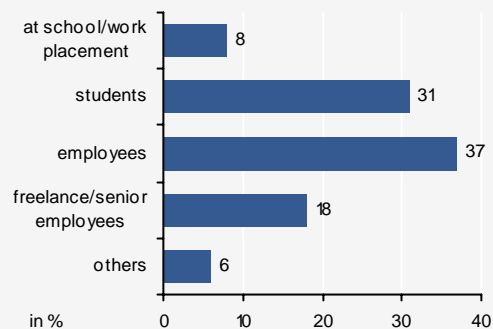
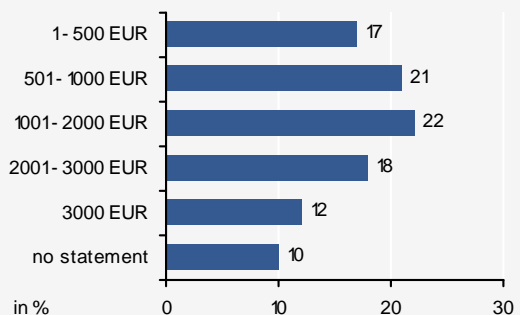


Chart 6: Income range of participants

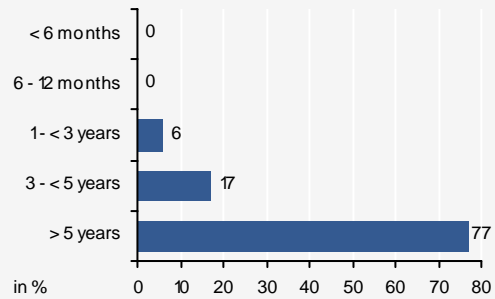
(n=185, personal monthly net income in EUR)



Use of Mobile Communication Systems

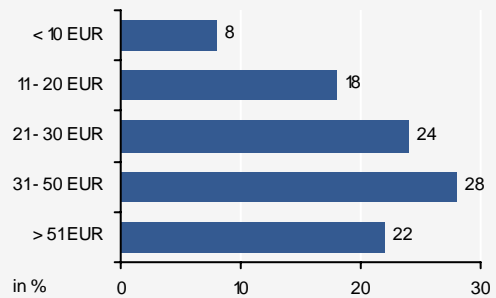
As expected, the participants' use of mobile communication systems was clearly greater than the average. All participants owned a mobile phone. At the time of the test period 85% of the participants were under contract with a telecommunications provider and only 15% used pre-paid cards. All participants had been using mobile telecommunication for more one year and 77% for at least five years (chart 7).

Chart 7: "How long have you had a mobile phone for?" (n=187)



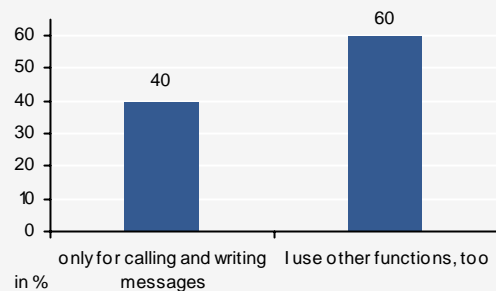
On average, half of the participants paid EUR 30 per month for mobile phone use, 28% up to EUR 50 per month and 22% would normally pay more than EUR 50 per month (chart 8).

Chart 8: "How much do you normally pay per month for your own mobile phone?" (n=187)



Before the test over half of the participants (60%) were already using other functions on their mobile phones in addition to text messaging and phoning (chart 9).

Chart 9: "Mobile phones today can do much more besides phoning, despite the fact that not everyone makes use of all the available functions. How do you use your mobile phone?" (n=188)

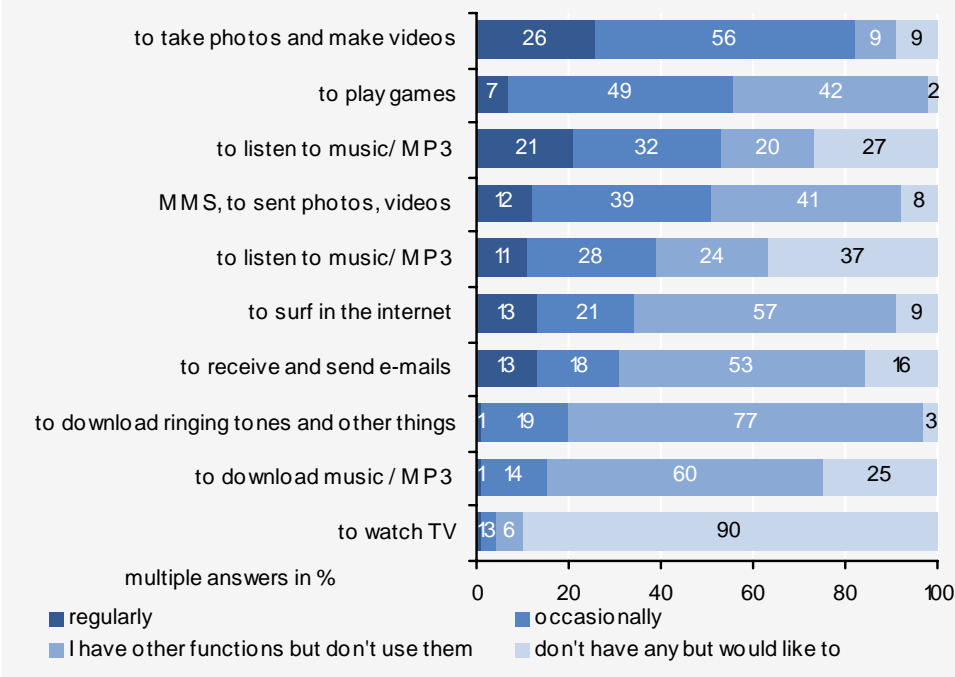


2. The Sample Group

This is an important feature of our sample group since people who use their mobile phones to make calls and send text messages are the overwhelming majority of mobile communication systems users¹³ We suspect that users of mobile TV at the time of market launch and as in our sample group would be those consumers particularly interested in trying out new features and who already use more functions on their mobile phones other than those for phoning and writing messages. We will see later that this type of consumer is highly critical of the technical functionality of the mobile phone whereas those who use their mobiles predominantly to make calls exhibit positive surprise at how easy the TV functions are to operate and are therefore more inclined to use the service as an additional feature. As expected, men are more feature-oriented than women when differences in mobile phone use between the sexes are considered. Among the participating women 44% were already using additional functions on their mobile phones, while the figure for men was 71%.

In terms of the additional functions used, photos and videos come at the top of the list at 82% (regular /occasional use), followed by games at 56%, and music and MP3 at 53%. At the same time we asked about functions not on their mobile phones but which the participants would like to see. Mobile TV was far and away the most popular choice at 90% (chart 10).

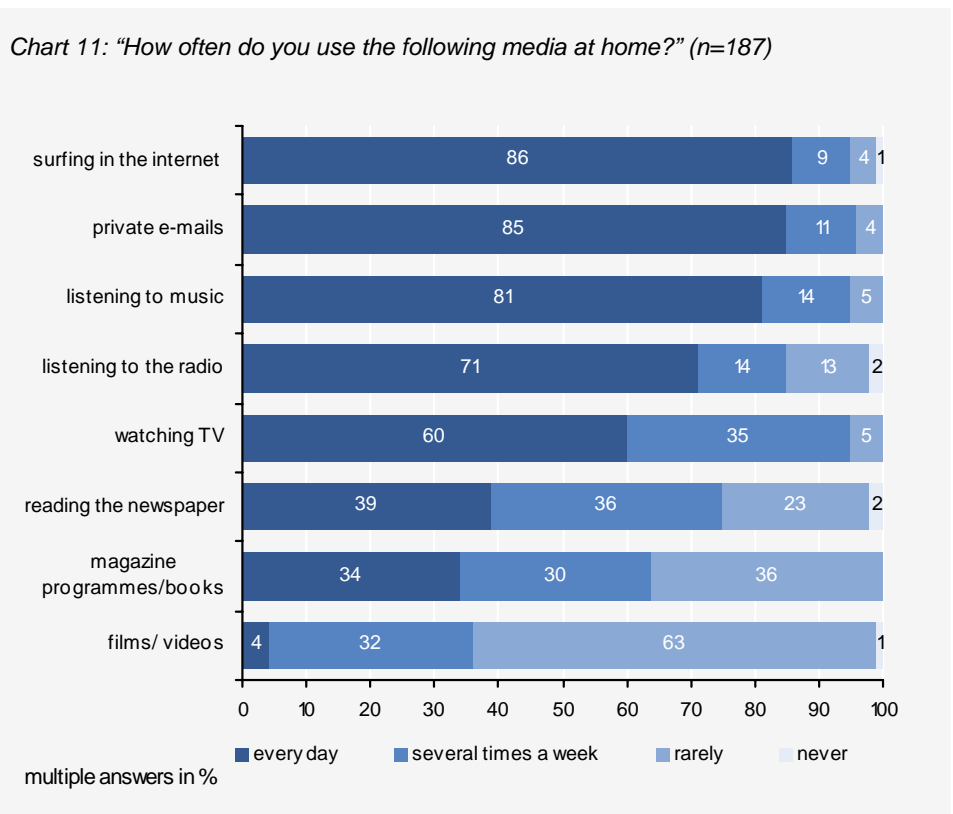
Chart 10: "Which other functions do you use on your mobile phone, if at all? (yes/no; selected functions?)" (n=190)



¹³ cf. Telecom Handel No 1/06 (9 January 2006), p. 29: Market Figures, Use of the Mobile Phone.

Media Use

The increased significance of the internet as an essential everyday means of information and communication is reflected in terms of media use among the participants. 86% of the participants spend time surfing the net at home every day and 85% read e-mails at home each day. In terms of daily use, the internet comes before the TV in our sample group (chart 11). Taking overall weekly use into account and not only daily use, both TV and internet achieve 95% usage. Our sample group therefore shows a clear bias for internet use and these values are significantly higher than the population average. The highest value for average “occasional online use” among working people is 67%, followed by men at 56% and women at 44%.¹⁴



The length of time spent using the internet on a private basis among our sample group could not, however, exceed the length of time spent watching TV. In terms of media use among the participants, it was important to bear in mind their high level of education since this increases internet use to the detriment of TV use. The average time spent watching TV among our sample group was roughly one hour less than the average according to age group (see below – occupation, level of education, and professional status are not taken into account). Almost all participants were in employment or training, over half were highly qualified employees, self-employed or managers. Many of the students were also in employment. From our conversations with the participants, we know that many of them were frequently on the move (e.g. rarely at home) and that the overwhelming majority was highly committed on a professional and

¹⁴ cf. Reitze (2005), p. 83.

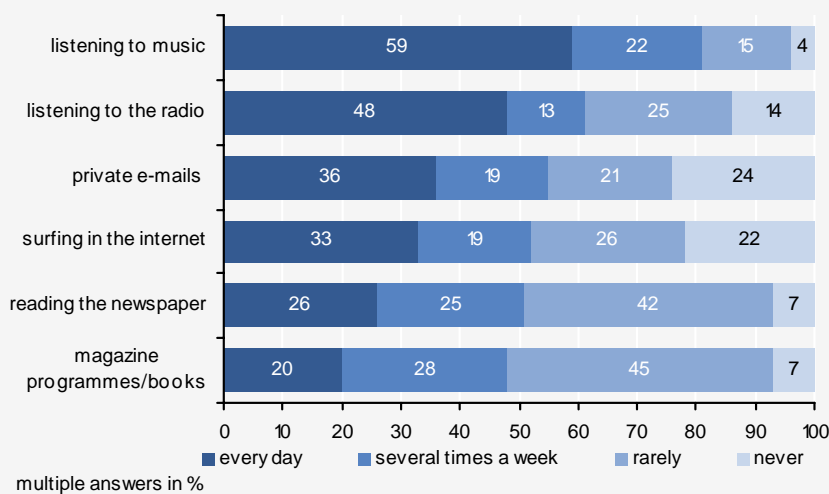
educational level. As a result, they had comparatively little free time in general to watch TV at home every day. This fits in well with the fact that watching TV as a time-filler played only a subordinate role for most participants (cf. chart 15). The everyday situation of the test participants as outlined here is, we believe, important for understanding their use of mobile TV because this form of broadcasting makes it clear that we are not on the whole dealing with people who are “down on” TV but with individuals whose daily routine does not fit in easily with extended periods of viewing at home. At the same time this results in a particular interest in mobile TV that makes these individuals interesting as a target group for offers in mobile telecommunication systems.

Mobile Media Use

The test participants use various media intensively throughout the day. We intentionally decided to extend the scope of mobile media use to include media use in the workplace and other locations where stationary TV sets are not available.

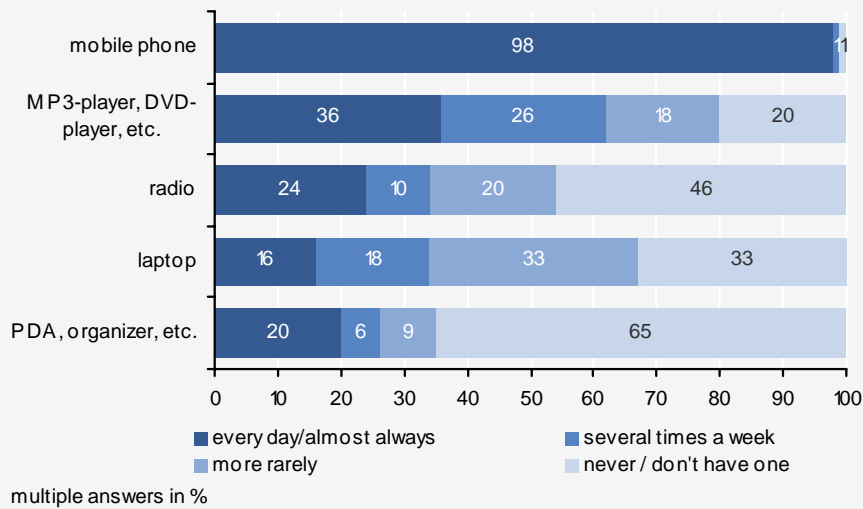
Overall, listening to music and the radio were clearly at the top of the list at 59% and 48% respectively (chart 12).

Chart 12: “Which media do you use during the day when you’re on the move?” (n=185)



Various devices were used: 37% of the participants were already using their mobile phones regularly or occasionally to listen to music or MP3s, 25% made use of VHF radio on their mobile phones while travelling. 98% of the participants carried their mobile phones with them on a daily basis or otherwise all the time. 36% carried a MP3 player or similar each day and 24% had a radio (chart 13).

Chart 13: "Which of the following devices do you carry with you when you're on the move?" (n=184)



Of course, this may also be a stationary radio during work, at another location or in a car. A third (33%) of the participants surfed on the net throughout the day, even if it is likely that the majority have stationary access to the internet at work since only 9% used their mobile phones for regular access to the internet. A quarter of the participants (26%) reported reading a newspaper while travelling.

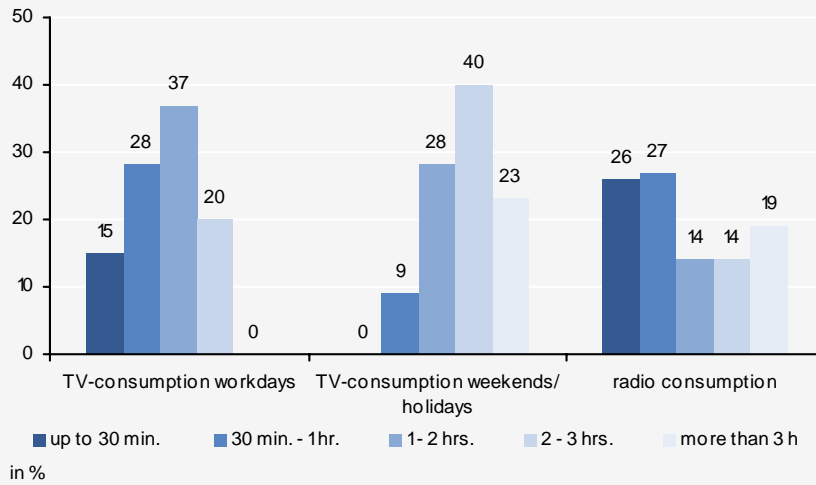
TV Use

60% of the participants said they watch TV at home every day and 35% reported watching TV at least a number of times each week. Almost all participants said they regularly spend on average between one and two hours watching TV on weekdays and between two and three hours at weekends. The test participants therefore spend an hour less watching TV than the average German according to age group.¹⁵ We suspect that that this may be completely consistent with a target group interested in mobile TV offers. It is possible that this target group is not recruited from consumers whose daily routine obviously fits in with longer periods of TV viewing but rather from a group of consumers who despite being regular viewers are not able to watch as much TV because of their daily routine. Two-thirds (63%) of the participants said they receive German national television via cable and the remaining participants via antenna (including DVB-T) and satellite connection.

¹⁵ cf. Reitze (2005), S. 68.

2. The Sample Group

Chart 14: "How much time do you spend watching TV on average? How long do you spend listening to the radio?" (n=177)

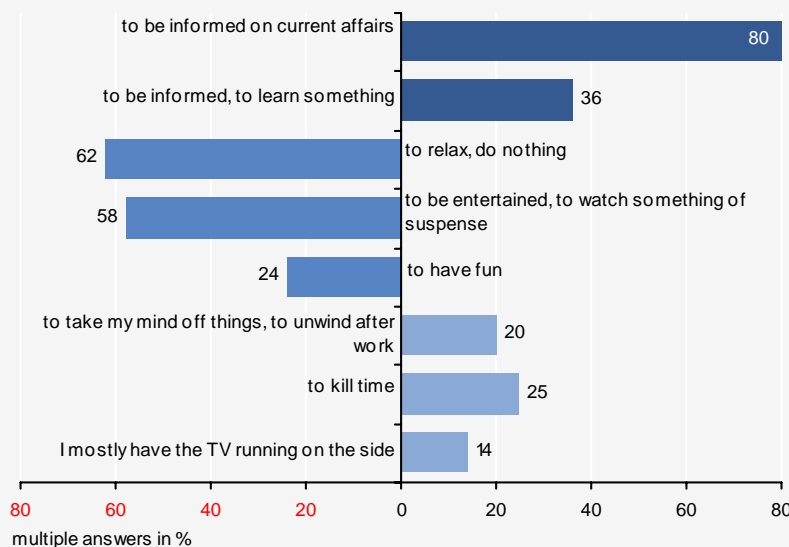


In terms of listening to the radio, the sample group is divided into those who spend a maximum of one hour each day listening to the radio (53%) and the remaining participants (47%) who exceed this listening time (chart 14).

As with the majority of the population, the reasons for watching TV include an interest in the latest news and information at 80%, followed by a strong need to relax and unwind in front of the TV at 62% and entertainment at 58%.

The participants therefore have targeted viewing habits with a focus on either news and information or relaxation (chart 15). Whiling away the time for our sample group is not an important reason since their time is restricted and the tendency to leave the TV just running is not widespread.

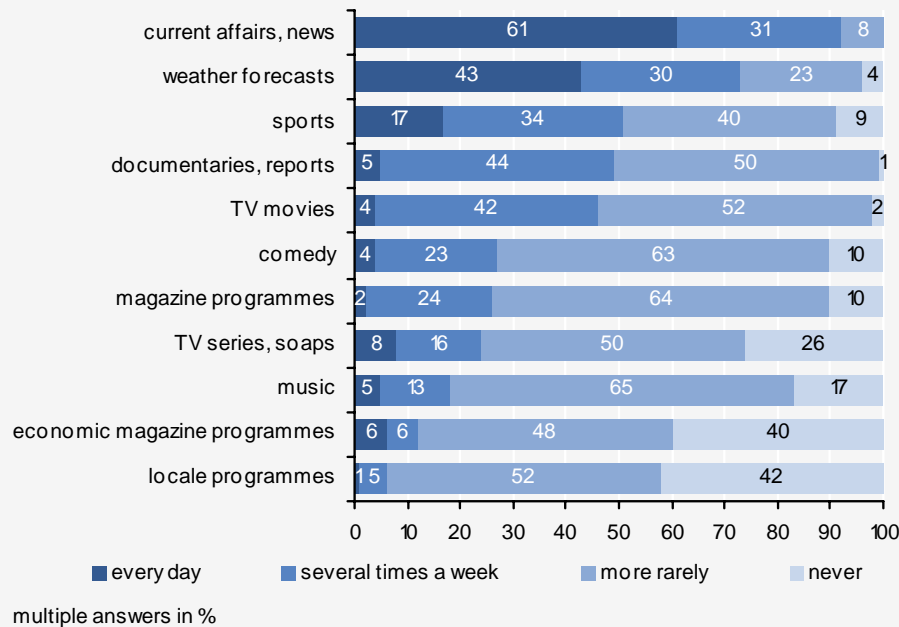
Chart 15: "There are many reasons for watching TV at home. Please tell us how often you watch TV based on the following reasons." (n=184)



2. The Sample Group

When asked which programmes they normally watch, almost all the participants put news and current affairs at the top of the list as expected. What is noticeable is that a comparatively high proportion, over a third at 39%, does not watch news programmes on a daily basis.

Chart 16: "Which programmes do you normally watch?" (n=186)



After news and current affairs came sport, investigative journalism, and feature films at 51%, 49% and 46% respectively as the programmes watched either on a daily basis or several times a week. 27% said they watch comedy programmes and/or television series and 24% reported watching soap operas (chart 16).

Unexpectedly, there were no significant differences in the viewing habits between the men and women. This is a further indication that the female participants represent a specific group of women who are not only technically astute but who also lean heavily towards programmes of an informative nature.

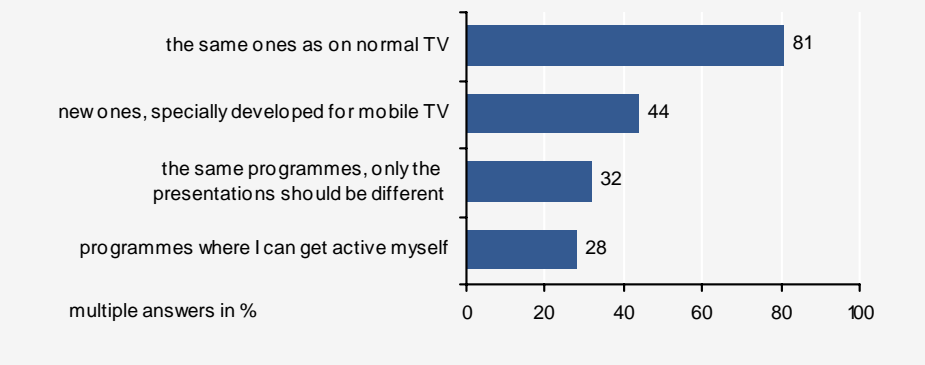
In the following section we will relate the results from the initial questionnaire carried out before the test to the participants' expectations of mobile TV and radio services. The expectations collected before the test are, from our point of view, comparable to the results collected from people following a one-off questionnaire about mobile TV without the participants having had any actual personal experience of the service. The design of our investigation aims to compare expectations with actual experience during the various test phases. We want to establish those expectations that have been fulfilled during the course of the test and those that are not. Although this could indeed give rise to disappointments, it could also highlight positive experiences, which can then be tied in to future developments in available services.

3. Participants' Expectations of Mobile TV and Radio Services

Mobile TV is an attractive proposition for the participants because they expect to be able to watch known TV channels on their mobiles. When asked about which channels they would like to see on their mobiles, 81% of participants responded that they would like to receive the usual TV programmes at all times and from any location.

The majority of participants considered new programmes or formats adapted specifically for mobile use not so much in terms of an alternative to but as an additional feature of the offer. An interest in new programme development was more important for participants than any adaptation of current formats at 44% and 32% respectively. Interactive programmes came at the bottom of the wish list at 28% among our sample group of participants (chart 17).

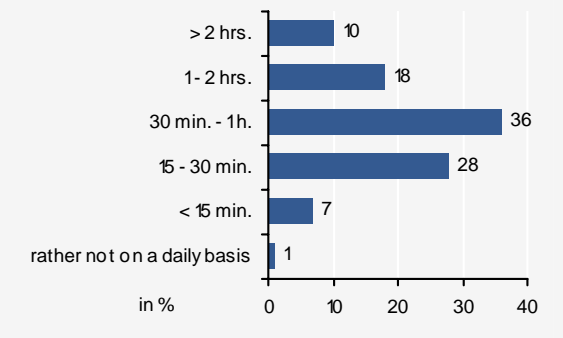
Chart 17: "Which kind of programmes would you like to see on mobile TV?" (n=180)



A further finding with regard to the participants' expectations was that although they wanted to see familiar programmes, they still anticipated major differences between watching TV on a conventional set and on a mobile phone. This is demonstrated in the length of time spent watching mobile TV, as well as in the anticipated situations and reasons for mobile TV use. The average amount of time participants intended watching mobile TV was a little over half an hour per day, or in other words half as long as watching normal TV (chart 18).

Participants did not see mobile TV as a substitute for traditional TV at home and neither did they expect to see evening TV use spill over into daytime hours, particularly on weekdays, because of new technical possibilities. For the benefit of later comparison, we would like to point out at this stage that a mere 8% of participants anticipated using mobile TV for less than 15 minutes whereas a good quarter of the participants imagined spending more than an hour each day watching mobile TV.

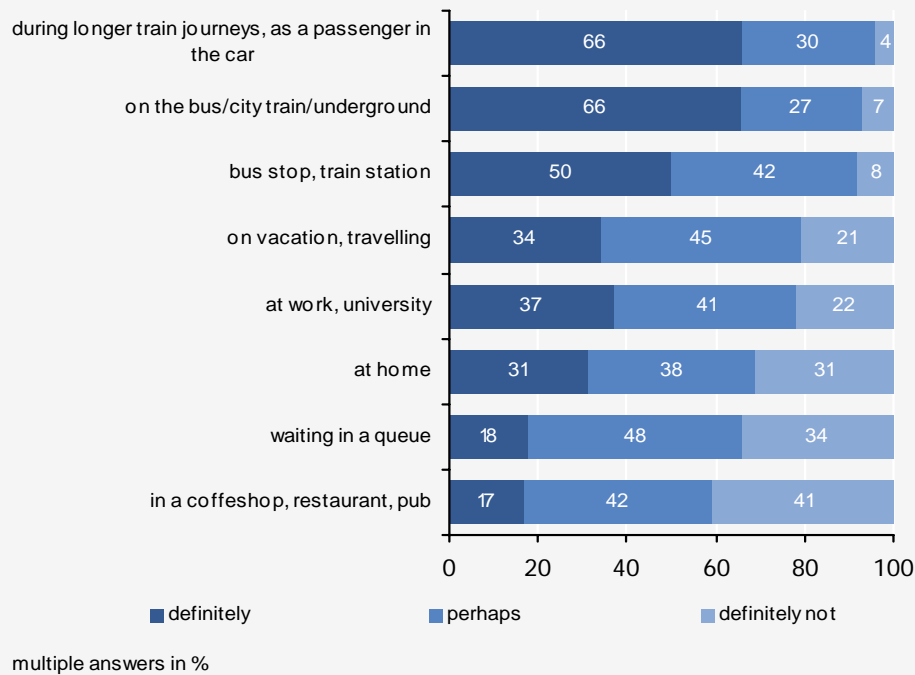
Chart 18: "Roughly how much time a day do you think you will spend using mobile TV?" (n=180)



Intended Situations of Use

Travelling represents the main situation for intended use of mobile TV (chart 19). Two thirds of participants predicted that would watch TV on public transport, in the car or when travelling by train. 50% thought that they would watch TV while waiting for a train, tram or bus.

Chart 19: "Where do you think you will probably use mobile TV?" (n=183)



Media use while commuting and travelling are typical situations for mobile use, although reading the newspaper and listening to music and the radio etc. have until now been the norm. Watching TV has not been a possibility until now. From a subjective point of view, mobile TV opens up new and exciting possibilities for the participants. We will see later on the importance of whether the offer actually covers the intended situations of use when participants come to make their assessment of the service. Longer train and car journeys outside Munich failed to fulfil expectations.

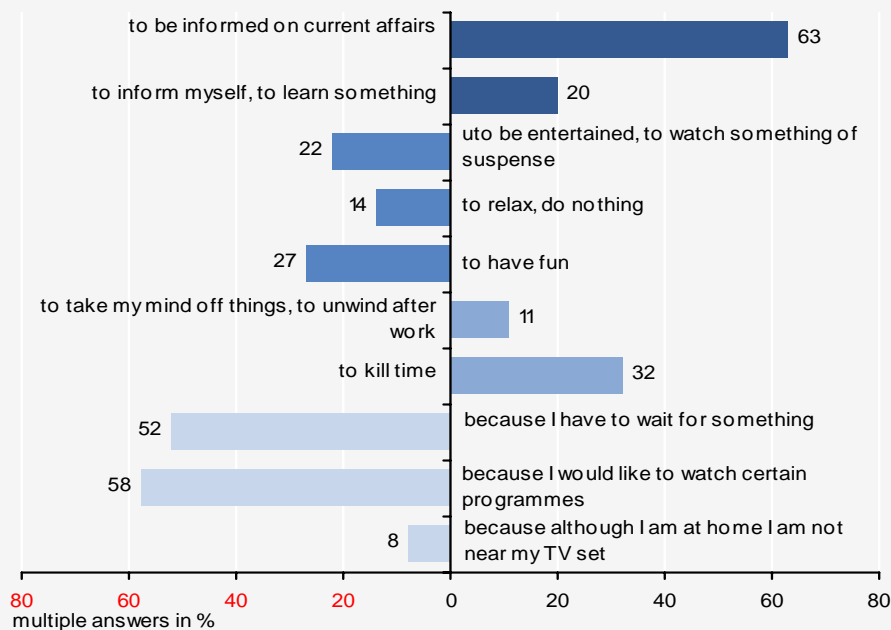
Intended Reasons for Use

In addition to the traditional reasons for watching TV as given in the above chart, we also added three mobile specific reasons to the pre-test questionnaire: "because I'm waiting for something", "because there are specific programmes I would like to see" and "because although I'm at home, I'm not in front of the TV set". The reasons in the following chart are arranged in the same order as those given for conventional TV viewing (cf. Chart 15). The bars to the left and right on the chart highlight the different dimensions: news and information on the right, light entertainment on the left, filling in time on the right, and mobile specific reasons related to mobility appearing on the left.

There are two clearly visible differences when the reasons given for watching conventional TV and mobile TV are compared: firstly, the mobile specific reasons for use, which include “making use of down time” and “watching specific programmes, despite not being at home”, as well as the significantly weightier reason of “filling in time”, form a strong set of reasons that are characteristic of mobile phone use.

Chart 20: “What advantages do you expect mobile TV to offer? What are the reasons that would probably encourage you to use it?” (n=185)

I would use mobile TV ...



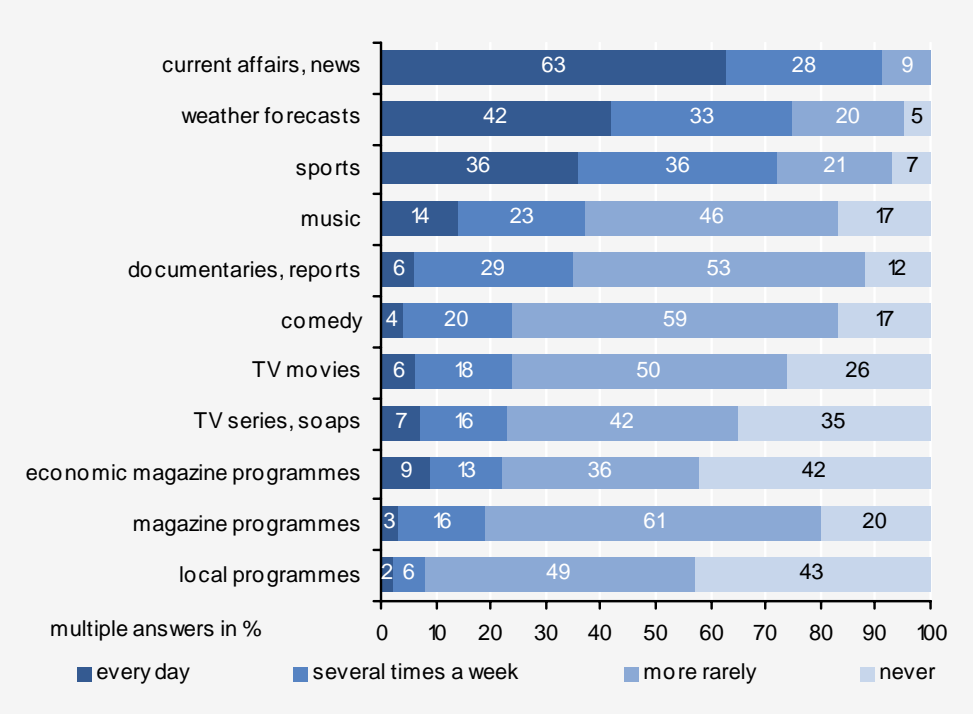
At the same time interest in news and current affairs continues to be the main reason for using mobile TV.

Secondly, light entertainment reveals another difference between mobile and conventional TV use. This type of programme is at the lower end of the scale in terms of intended use. With conventional TV use, programmes for relaxation and entertainment come in second and third place at 62% and 58% respectively after news and current affairs (cf. chart 15). Yet in terms of intended mobile TV use, relaxation and entertainment are in sixth and eighth place at a mere 14% and 22% respectively. Filling in time and having fun are more important at 32% and 27% respectively (chart 20).

Intended Use of the Programme Offer

The participants' expectations in terms of programmes and programme types that they would like to watch on their mobile phones vary greatly from the programmes normally watched. Only sport was more important because of the World Cup and feature films were at the lower end of the scale (chart 21).

Chart 21: "Which type of programme would you like to watch on your mobile?" (n=182)

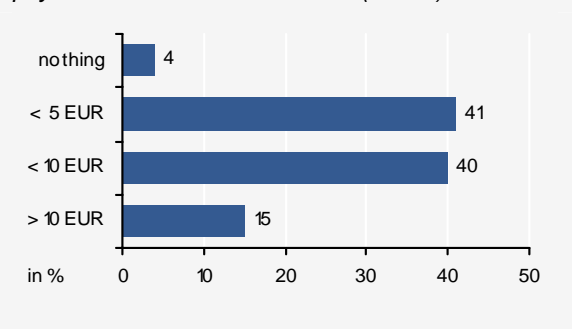


Willingness to pay prior to the Test

The willingness to pay prior to the test and therefore before the World Cup was between "up to EUR 5" at 41% and "up to EUR 10" at 40%. Later in the test it was noted that willingness to pay EUR 10 or more for the service had increased to 55%, just over half the participants (chart 22).

One can draw the conclusion that the participants expect mobile TV to offer them the opportunity of broadening their existing use of media to new everyday situations and at different times of the day. The anticipated changes in TV use are not based so

Chart 22: "How much more would you be willing to pay each month for mobile TV?" (n=187)



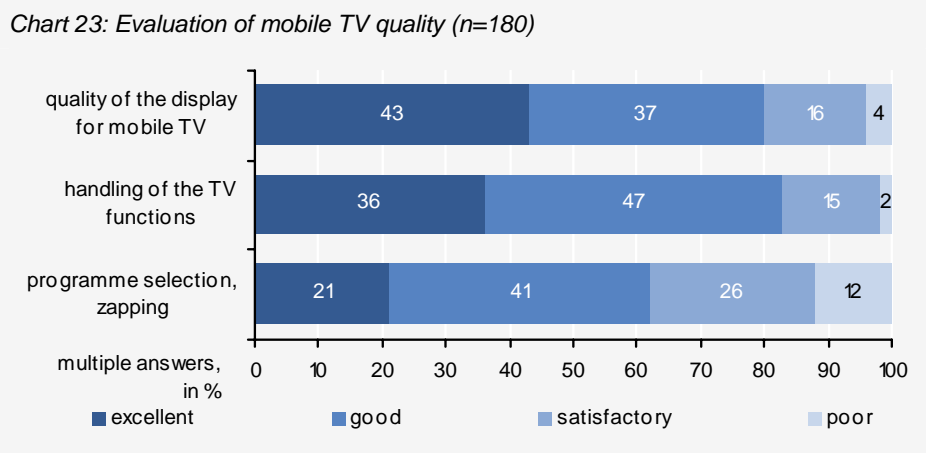
much on content (here, participants expected to receive the familiar range of programmes as part of a basic package), rather on the length of time spent using the device and the intended reasons for doing so. Compared with conventional viewing habits, relaxation and entertainment come lower down the list of reasons after news and current affairs. The emphasis on known TV programmes is expressed in the fact that "being able to watch specific programmes while on the move" was the reason most frequently given from the list of additional reasons related specifically to mobile use. In the pre-test questionnaire the forthcoming World Cup was a large-scale media event and keeping track of the tournament at any time was a decisive factor for the participants. The wish to "fill in down time while on the move" and to "while away the time" were of equal weighting with the need for news and current affairs in the reasons given for mobile use, irrespective of the World Cup. This

particularly applied to commuting on public transport and travelling – filling in down times by keeping up-to-date with the latest news and events.

4. Mobile TV Use in the First Test Phase

The participants in the Munich user test came to the following conclusion: mobile TV is an interesting way to watch TV. It is not for nothing that mobile TV is frequently referred to as *Mäusefernsehen* (literally “mouse television”) in German public debate. There are major differences compared with stationary sets: the display screen is very small and the device must be continually held so the image can be seen. Overall, situations of use are generally far removed from stretching out on the sofa in front of the TV at home. Nevertheless, the overwhelming majority of participants described mobile TV quality as “good” to “very good”. Quantitative and qualitative findings reveal that there are three crucial aspects for this assessment of mobile TV.

The first relates to good picture quality on the mobile phone. Almost all participants were surprised at how much detail can be seen if the viewer looks closely enough. Secondly, being able to use the device quickly and easily is important. Unlike some mobile functions, watching mobile TV is operated by simply pressing a button and then seeing the programme appear immediately on the display screen (chart 23).



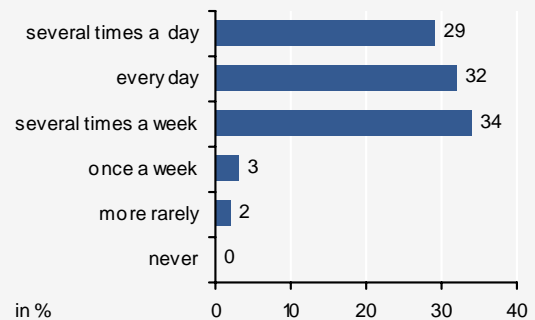
Thirdly, selecting a programme is no harder than using a remote control. There are no tedious navigation procedures to follow unlike internet TV or UMTS and even changing channels is like conventional TV. This makes mobile TV a “relatively normal” way to watch TV. In addition, programmes and channels that are known and trusted can also be watched. These programmes are familiar and viewers know the ones they are interested in and on the whole the scheduled broadcast time too.

As illustrated above, the participants did not, however, intend watching the full range of programmes on their mobile phones. The participants already knew before the test that they would not use mobile TV in the same way as conventional TV. The question to follow on from this has more to do with what the participants would actually watch under conditions such as these.

The initial positive impression from the test awakened the participants' curiosity. The fun of trying out the device and of course an interest in the World Cup featured heavily in the first test phase. During this phase participants intensively investigated the technical quality of the service, the device itself, the programme on offer and above all the situations related to daily use. As expected, the interested and predominantly technically aware test group of participants with above average educational achievement were open enough and keen to experiment, yet at the same time were also critical when discovering and naming particular shortcomings.

Usage during the World Cup was extraordinarily intense and mobile TV proved itself to be a suitable medium "to keep up-to-date with events" while on the move (chart 24). Although the effect of the World Cup had a strong influence on mobile TV use, it also had the hidden benefit of letting participants investigate mobile TV intensively. The effect of the World Cup allowed us to observe situations of use that would otherwise have been unusual at such an early introductory stage. Interesting conclusions related to the effects of media events can be drawn by comparing both phases. This comparison also prevents any hasty statements such as mobile TV is not watched for more than 15 minutes. Under certain conditions mobile TV is watched for longer periods of time. In the following sections use of mobile TV services by the participants during the World Cup will be more closely analysed in terms of intensity, reasons and situations of use.

Chart 24: Frequency of use during the World Cup (n=179)



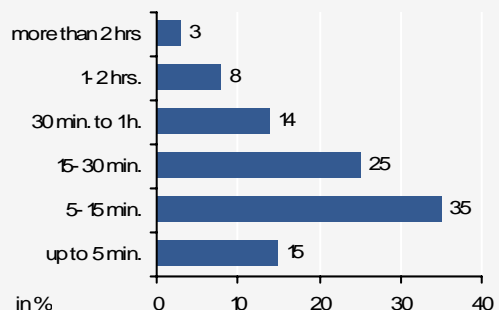
Intensity of Use during the World Cup

In the first four weeks participants used their mobile phones for watching TV extremely frequently, as well as intensively and for comparatively long periods of time. A feature of the initial test phase was that frequency of use soared: two thirds of participants watched mobile TV every day. In terms of daily use a large share of participants spent up to a quarter of an hour watching mobile TV each day (chart 25). Almost half the participants used their mobile phones during the World Cup to tune in briefly and/or get the latest information. A quarter watched more than 30 minutes a day.

Participants in the group just mentioned included the 11% of participants who watched mobile TV for over an hour and some for the entire duration of a World Cup match.

However, the difference between the participants' expectations before the test (cf. chart 18) and the time actually spent using the device was marked and noticeable. Almost all participants (92%) expected to watch mobile TV for longer than 15 minutes per day when in fact only 50%

Chart 25: Period of mobile TV use during the World Cup per day (n=182)

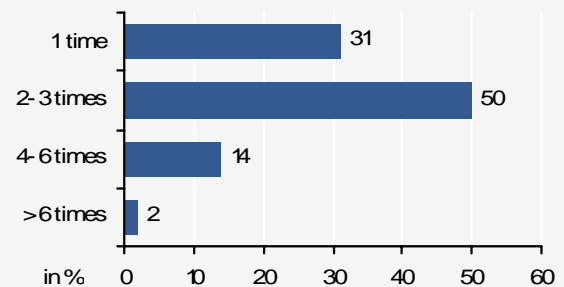


4. Mobile TV Use in the First Test Phase

watched for more than 15 minutes during the World Cup. It appears that despite massive interest during the World Cup, mobile TV use was clearly only for a comparatively short period. The reason for this as we have already seen is not due to a lack of quality in the service rather that this medium is possibly not suited to long periods of relaxed and easy viewing. In practice, mobile TV is less to do with how TV is watched in the home. It is demanding and something the user needs to adjust to and in a certain sense learn how to operate. If there is something interesting to watch, such as the World Cup games, the mobile phone is switched on more often but is not left running for long.

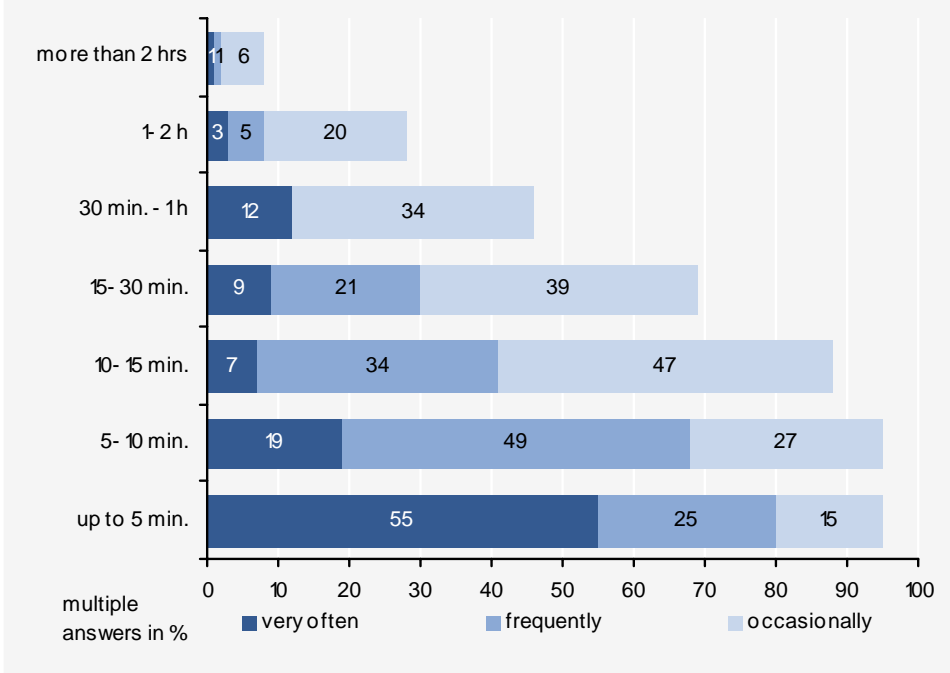
During the World Cup half the participants tuned in several times a day (chart 26). The number of times participants used their mobile phones on a daily basis was unusually high and this was presumably due to the fact that the World Cup and the novelty of watching mobile TV came together at the same time. Both these reasons meant that the participants were motivated to switch on their mobile phones repeatedly and for short periods of time, if only perhaps to show other people.

Chart 26: Number of times used per day during the World Cup (n=174)



This, therefore, resulted in an accumulation of short discreet periods of use (chart 27). Mobile TV was frequently switched on for periods of less than five minutes. Periods of use lasting up to 15 minutes were common. Longer than 30 minutes was rare.

Chart 27: "Thinking about individual situations of mobile TV use, how long did you spend watching on average?" (n=154)



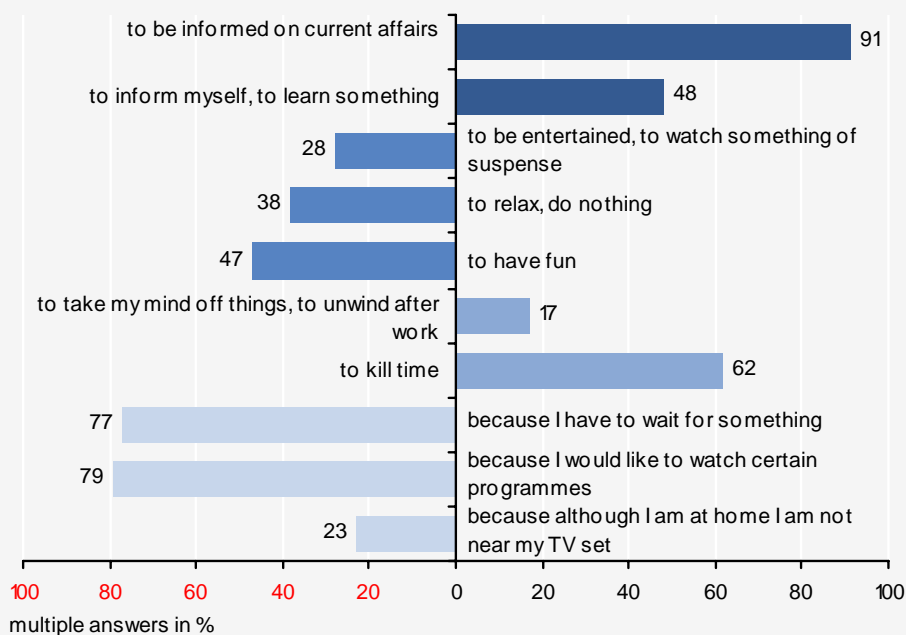
More interesting than how rarely participants watched mobile TV for longer than 30 minutes is the fact that participants did use this medium and the manner in which it was used. In general, World Cup matches were not watched in their entirety but only in part. The mobile TV was switched on a number of times if the situation the participant found him/herself in was propitious.

Nevertheless, the results show that periods of mobile TV use were generally much shorter than watching TV at home or listening to the radio. There are three reasons for this: firstly, most situations of use *per se* were time-restricted, e.g. bus journey time or while waiting for the next tram; secondly, watching TV on the small mobile screen is demanding and watching over a longer period of time demands a relatively high level of concentration; thirdly, mobile TV responds to other interests different to the ones enjoyed at home, e.g. the apparent interest in “tuning in quickly” while on the move and without wanting to take in a whole programme. This was very important for the participants during the World Cup and served to validate fully the benefits of mobile TV. This can be clearly seen in the reasons given by the participants for using mobile TV during this period. We will return to these reasons in greater detail later.

Reasons for Use during the World Cup

During a media event like the World Cup the possibility of being able to tune in at any time is particularly attractive. Almost all participants (91%) quoted “keeping up-to-date with the latest events” as the most important reason for use (chart 28). The second most important reason given by participants was that of “watching specific programmes despite not being at home” at 79%. This coincides with the wish of not wanting to miss anything and to be there almost “live” as events unfold. 77% of participants watched mobile TV while waiting and two thirds (62%) to fill in or make good use of down time while on the move.

Chart 28: Reasons for mobile TV use in the first test phase (n=185)

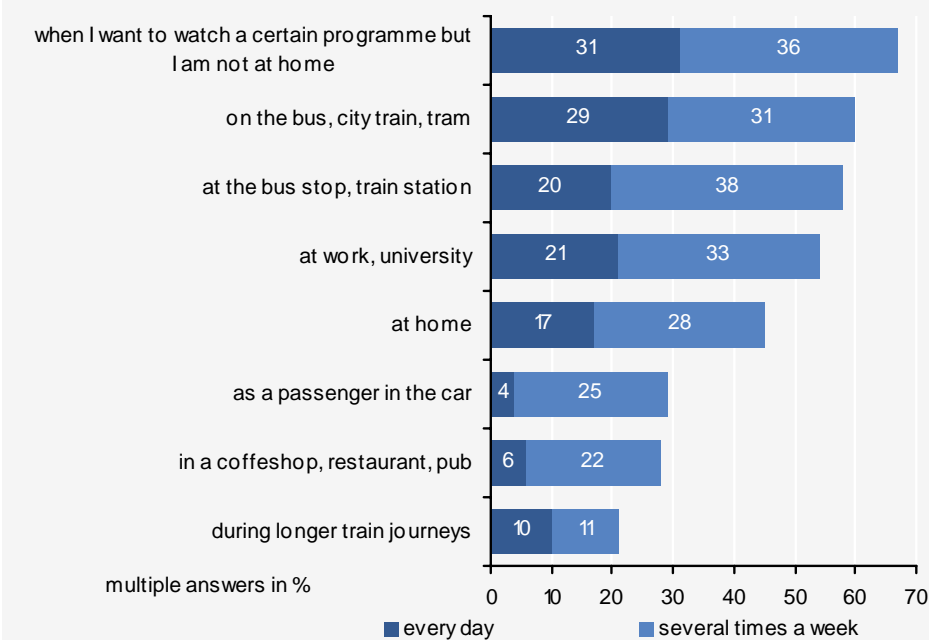


The reasons for mobile TV use during the World Cup largely correspond with the participants' expectations before the test. The need to keep up-to-date with current events was greater than expected. Reasons such as waiting, filling in time and wanting to watch specific programmes (otherwise known as "mobility reasons") were greater than expected and obviously interacted heavily during the World Cup. Even watching mobile TV for fun was greater than expected during this phase of the test. The traditional reasons for watching TV at home, such as entertainment and relaxation, were clearly less important in the use of mobile TV. As expected from the participants, the reasons for mobile TV use are structured differently from those of traditional home viewing.

Situations of Use during the World Cup

Situations of use correspond to the reasons given in which the mobile phone is used to watch TV. It is not so much the situation in which the participant finds him/herself that matters but the overall wish to be able to tune into World Cup broadcasts even at times when the participant is not at home. These situations, which, as expected, are particularly suitable for mobile TV use, were largely taken advantage of as the participants had anticipated in the initial questionnaire (cf. chart 19). This was especially the case when commuting on public transport or while waiting at bus and tram stops. One out of two participants also watched mobile TV regularly during working hours (chart 29). Previously at the top of the list for situations of use was "long train journeys and while travelling as a car passenger" but these situations became less important under test conditions because the reception range was restricted to the Munich city area and therefore excluded long distance train travel.

Chart 29: Situations of use during the World Cup (n=167)



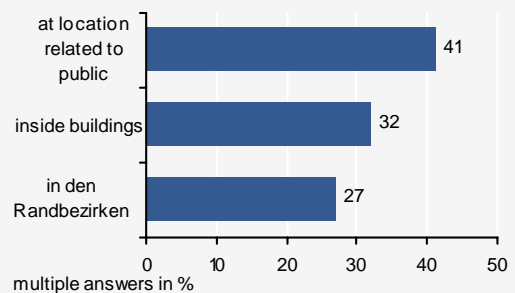
Apart from “normal viewing times”, other rules also applied and were tolerated during the World Cup: watching TV at work, in public and in the presence of other people. A quarter of participants even watched mobile TV with other people or let others look in. Many participants reported that mobile TV was a main talking point. During the World Cup a third of participants tuned in and used their mobiles as an additional TV. 20% switched their mobiles on in the stadium or when they were watching games on a large screen in a public viewing area; 8% used it in addition to their conventional TV set while at home.

Matches and match reports that took place on work days were broadcast live during the day and participants wanted to follow events if they were not at home and could not sit in front of the TV set. To be able to do this at pre-determined times throughout the day, people would always have to tune in no matter where they were at a specific moment in time or failing that completely re-arrange their schedule around the World Cup. Mobile TV was therefore typically used (almost) everywhere at this time. There was hardly a situation that was not out of bounds – at the same time it is difficult to identify typical situations of use for mobile TV during this phase of the test.

The participants regretted that it was not possible to use mobile TV on long train journeys during the test period. This is where there is certainly significant potential for future growth if network development moves forward. The lack of reception on the Munich underground and on sections of the suburban rail network also came in for heavy criticism. This situation was particularly irritating to those participants who spent a significant amount of time on public transport every day. This situation led to their main expectations remaining unfulfilled.

77% of participants replied “yes” when asked if there were any locations where they would have liked to watch mobile TV had reception been available. When then asked to name the relevant locations 41% said public transport with 21% relating to the Munich underground network. Bad and/or poor reception particularly in city centre buildings and in suburban areas were criticised by 32% and 27% of participants respectively (chart 30).

Chart 30: “Are there any locations where you would like to watch mobile TV, but there is either no reception or it is otherwise poor?” (n=170)

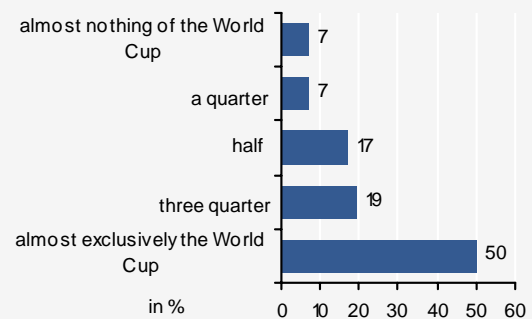


Use of World Cup specific Programme Offers

The programmes and channels on offer as part of the test were extremely attractive to participants, especially as up-to-date reports on the World Cup were a focal point of TV and radio use at this particular phase of the test.¹⁶ Live broadcasts were the main area of interest and this was the reason most frequently given for watching mobile TV at this phase of the test so “specific programmes could be watched despite not being at home”. The German national broadcasters, ARD and ZDF, transmitted the matches live and were by far the most watched channels. Over half the participants watched both channels daily and almost all participants tuned in at least several time a week.

For the majority of participants, watching mobile TV during the World Cup was an extremely popular medium for keeping up-to-date while on the move. Almost every participant (92%) watched World Cup games on their mobile phones. Not only does mobile TV fulfil a need for news and information, the visual impression it makes on the viewer also conveys direct emotional content. Use of mobile TV therefore focused heavily on the World Cup. During the initial test phase over half the participants overwhelmingly watched World Cup matches or reports on their mobile phones (chart 31).

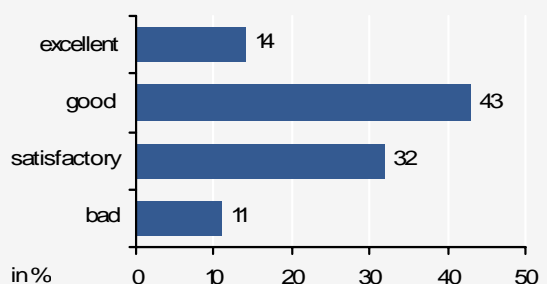
Chart 31: “What was the proportion of time you spent watching the World Cup in the last week of the tournament” (n=182)



We will demonstrate below that widespread interest in the World Cup had a positive effect on the other programmes and channels available to view. The effect of the World Cup in encouraging the participants to tune in also led them to watch other programmes.

In hindsight, the positive assessment of mobile TV during the World Cup phase appears hardly surprising although opinion was divided when World Cup fans or sports enthusiasts were asked whether they would watch football matches, the Tour de France or a handball game on the display screen of a mobile phone. The image on a mobile phone appears to be too small to be able to follow the match. Match broadcasts on a conventional TV set with a large screen include many wide shots and fast-moving picture sequences; at tense moments in the game the limits of mobile broadcasting quality become apparent. Despite this, most of the participants’ assessments of the matches they watched on their mobile phones were rated “good” to “very good”(chart 32). Conversations and focus group discussions with the participants revealed that their positive response did not affect their awareness that there would be limitations to watching mobile TV. Areas of criticism were fully addressed. Watching football on a mobile phone undoubtedly does not have the same quality as a

Chart 32: “How do you rate watching the World Cup on mobile TV?” (n=161)



¹⁶ cf. Geese u.a. (2006) und Mai (2006).

conventional TV set and this is why some participants described using their mobile phones as “a last resort”. This assessment must not, however, automatically lead to disappointments. We therefore investigated more closely how the participants watched mobile TV during the World Cup.

Firstly, watching football on a mobile phone has a different aim from that of watching football at home on a large TV set. Mobile TV primarily allows the user to get a good idea of the game and experience the tension and excitement as it unfolds. Having the latest information and being part of the action are the attractions of this particular medium. Watching TV on the small display screen of a mobile phone is undoubtedly a compromise when compared with conventional TV, but mobile viewing is used for other reasons and under different conditions.

Secondly, those using mobile TV tend not to watch it too closely over a continuous period of time but rather have short bursts of concentration in which the game is followed rather than listened in. Watching mobile TV is on the one hand demanding and on the other requires attention depending on the situation. However, there are two reasons why the viewer is able to follow the game: firstly, football match broadcasts come with commentary and the viewer to listen to the commentator during the match, secondly every match has fewer moments of intense excitement. The important thing is that the viewer does not miss the crucial moments of the match. This is where the football broadcasting format has a number of specific advantages: the viewer can tell from the noise of the fans in the stadium and the commentator’s intonation if a something exciting is about to happen. And even if the viewer has missed a spectacular scene, s/he can assume that the scene will be shortly repeated, usually in slow motion.

These qualities of the football format are particularly advantageous for mobile TV because the situations themselves often have no exclusive bearing on the programme itself. In many of the situations given above the viewer is still engaged in other activities at the same time, such as travelling on a bus, at work, eating or walking somewhere. Mobile TV often comes hand in hand with doing something else at the same time. These situations are subject to distractions, interruptions and to which the viewer must respond.

Football matches are ideal for watching TV while doing other things because the score appears on the screen and where moments of tension and excitement are audible and repeated. In other words the game can be easily heard and the exciting moments seen again in the repeat.

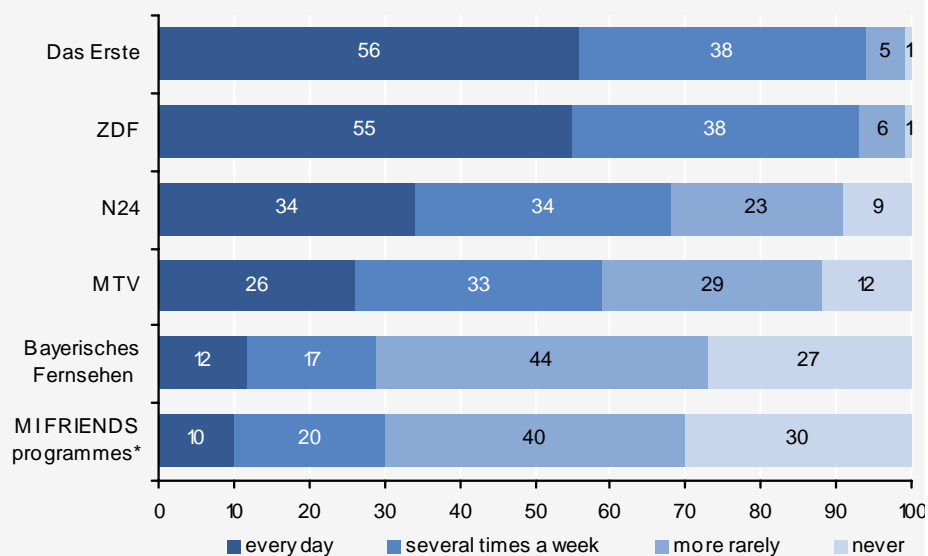
In other broadcasting formats there are frequently problems to do with losing track of the plot, which in turn makes the programme less fun to watch. Football matches belong to a broadcasting format where the viewer can easily tune back in again. The small print size of the score superimposed on the screen was heavily criticised by the participants. In addition the participants saw it as a very attractive proposition to be able to get a quick glimpse of the current state of play while on the move; match scores were what spurred interest in the World Cup. An interesting question leading on from this is what this particular format can teach about content design for other programmes.

Use of non-World Cup specific Programme Offers

The intense interest in the World Cup and the novelty of mobile TV had a positive effect on the use of other non-World Cup specific programmes as demonstrated on closer examination of the broadcasters and formats watched by the participants.

During the World Cup ARD and ZDF aimed to achieve daily mobile coverage of 56% or 55%. Almost every participant watched both channels several times a week (chart 33). The German news channel N24 was also watched daily by over a third of participants and two thirds tuned in several times a week. Viewing music channels on mobile TV was significantly more attractive to participants than watching them at home on a stationary TV set. (cf. chart 16). This can be primarily traced back to the fact that MTV was intensively used. Over a quarter of participants watched MTV on a daily basis and over half tuned in at least several times a week. Included in these figures are many participants who do not watch MTV at home.

Chart 33: „Which mobile TV programmes do you watch?“ (n=157)



multiple answers in %

* MIFRIENDS- programmes consist of: "MIFRIENDS Mix", "BRpocket", "Sport & LokalTV", "Das Modul".

30% of participants regularly tuned in to the regional TV channel *Bayerisches Fernsehen* and a similar number frequently watched the MI FRIENDS programme offer specially put together for the test.¹⁷

¹⁷ It must be noted that the MI FRIENDS programmes set up for the test were not updated in their entirety on a daily basis.

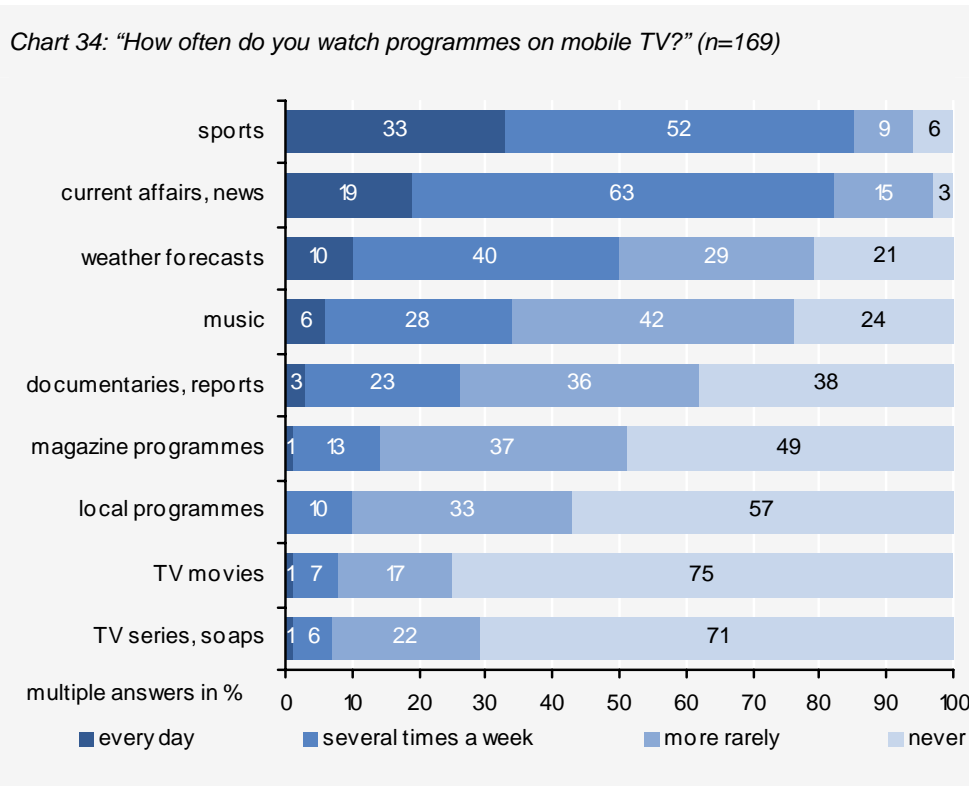
What is striking is that after ARD and ZDF two special interest channels occupy the third and fourth places in the list of most popular channels. The results from the questionnaires (particularly the answers given to the open questions) and focus group discussions reveal in both cases that content, i.e. news and music, and the broadcasting format are particularly attractive for mobile TV use.

The programme format of N24 corresponds to the participants' interest in the latest news and information (see also reasons for use). The latest news and information from the World Cup also played a role but was not a decisive one. When participants were asked in the open question about the programmes they enjoyed watching on their mobile phones, N24 received a positive assessment because the viewer is not bound to specific times of day. N24 regularly broadcasts the latest news and information and there is a high probability that news can be watched by switching on the mobile phone as and when the opportunity arises, e.g. on the bus in the morning or over lunch (see the daily log results in section 6). The short duration of news reports fits in well with the timeframe for mobile TV use, which is heavily determined by daily situations and the short periods of use as described. Short content-bound sequences are typical of the news format and fit in with short periods of use. In addition, the viewer can find his/her place easily if s/he has missed the start of the programme and this also applies to other news-based formats (see below).

MTV was frequently watched to while away the time while on the move and is an alternative to listening to music on a MP3 player (not always to hand) or radio. This also has the advantage that the viewer can tune in to music clips at any time and is not bound to specific times of day. A crucial factor is that people want to listen to music in different situations throughout the day and already do so with a radio, MP3 player and other similar devices (cf. chart 12). In addition MTV is highly suited to mobile viewing while on the move; the user can *listen* to the music and occasionally glance at the video: "MTV is the most interesting if you're on the move". Watching music on the mobile phone is also used as a distraction when waiting and as background music during work for instance.

Mobile Use of Different Programme Types

During the World Cup sports programmes came at the top of the list before news and information programmes (chart 34).



82% of participants watched news and information programmes daily or several times a week. Participants not only watched World Cup related news but also general news broadcasts. 19% of participants even watched the news daily on their mobile phones. Overall intensive use during the World Cup had a positive effect on all programme types. This compares with use of programme types after the World Cup in the second test, of which more in section 5. What is particularly striking is that documentaries and magazine programmes were watched in addition to news and information programmes.

Conversely feature films and TV series were at the bottom of the list, particularly when compared with conventional TV use. When interpreting these results it is important to bear in mind that the major private channels, RTL, Sat1 and ProSieben, were not represented in the test, leaving a significant gap in the choice of light entertainment programmes popular with the test group. Comments on the use of light entertainment programmes and their significance in mobile TV will not be unqualified because had there been a wider range of this programme type, participants may possibly have made use of them.

Many participants tried out the various offers in the first test phase. This included programmes that participants had not expected to be particularly attractive for mobile TV use. From the focus group discussions we know that this viewing experience was not positively rated, particularly with regard to features films, which on the small monitor cannot be easily followed without some effort by the viewer. A lot of information about the story is visually

represented and if the viewer loses track it is difficult to pick it up again. What is interesting though is being able to watch the start of the feature on mobile TV while on the move and to finish watching the programme at home.

The lack of EPG during the World Cup did not prove to be a major problem. Over two thirds of the participants, or 71%, said that they would either watch the same programmes or 65% said that they knew when and on which channel a programme they would like to see is actually on. What is interesting, however, is that almost the same number of participants (57%) obviously had no problem channel hopping on their mobile phones. This finding is quite clearly down to the DMB service and user comfort specifically designed for this type of use in the test device.

High Expectation of Mobile TV Use during the World Cup

The overwhelming majority of test participants wanted to pay for mobile TV in the future. During the World Cup 77% of participants said they would definitely or possibly continue using mobile TV after the test, while only 23% said they would not use it (chart 35).

Intensive use during the first test phase and the positive experiences in terms of service quality therefore led to a high expectation of future mobile TV use. What is striking, however, is that most participants had not yet made a definite decision and that this would be dependant on a number of conditions. One of these conditions was price.

The participants' willingness to pay was also very high with 82% of participants wishing to purchase the service. The majority, however, was not willing to pay more than EUR 5 (chart 36). Just under a quarter at 23% said they would pay merely an additional EUR 2, while 36% were willing to pay up to EUR 5 and a mere 23% over EUR 5.

Despite the positive assessment and intensive use during the first test phase, willingness to pay had clearly dropped compared with the initial pre-test questionnaire. At this stage 96% said they were willing to pay for the service. Significantly, 55% of participants said they were willing to pay over

EUR 5 for mobile TV (cf. chart 22). This figure was now just under a quarter.

It is possible to summarise by stating that during a media event like the World Cup there is a ready willingness to pay a subscription for the use of mobile TV in the future. Yet it appears that personal experience of the service means participants willingness to pay an additional monthly charge falls below the EUR 5 threshold. Justification for this stance was given in the focus group discussions when participants said that the programmes watched are either free and/or already paid for through TV and radio licensing. A charge of EUR 2-5 was accepted for transferring programmes to a mobile phone but from the

Chart 35: "After returning the mobile at the end of the test, do you think you will continue using mobile TV?" (n=174)

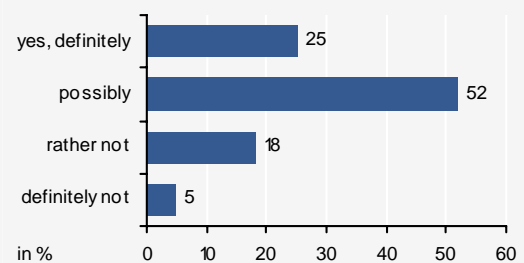
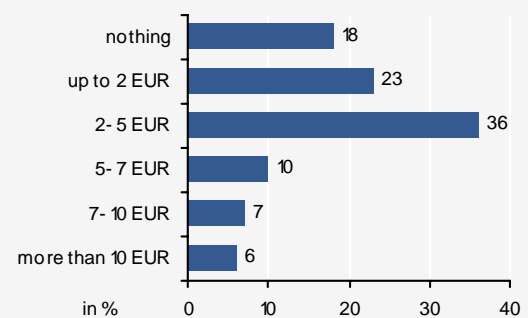


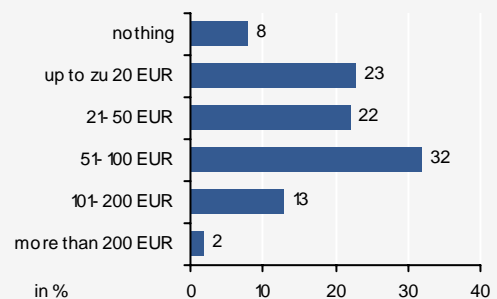
Chart 36: "How much would you be willing to pay as a basic monthly fee for mobile TV on top of your existing monthly mobile phone charge?" (n=179)



impression we gained during discussions with the participants this fee was not seen as a charge for televisual content.

Almost 92% of participants in our technically astute sample group were willing to spend. Just under half at 45% were willing to pay up to EUR 50 extra on taking out a contract, while 32% were willing to pay between EUR 50 – 100 and 15% more than EUR 100 (chart 37).

Chart 37: "How much would you be willing to pay for a TV compatible mobile phone taken out on contract?" (n=172)



Experiences of Mobile TV during the World Cup

We believe there are a number of useful pointers for the future development of mobile TV based on user experience during the World Cup:

- The main reasons for using mobile TV during the World Cup revolved around the ability to keep up-to-date on the latest events and to be able to watch specific programmes despite not being at home.
- Mobile TV is a medium that is always at the owner's disposal. It is a particularly attractive medium for live events. A high level of user interest is characterised by the fact that people do not want to miss specific programmes. The World Cup *per se* is an exceptional situation. Nevertheless it may be assumed that smaller events will also increase use, e.g. events for specific target group could be used to generate interest in mobile TV.
- Mobile TV is a (stop gap) solution for situations where a conventional TV set is not available. Football matches watched on a mobile phone were favourably evaluated although this medium did not deliver the same TV experience as watching a match on a large TV set at home. The experience of watching mobile TV is different. It enables the owner to keep up-to-date with the latest events without being tied down by a conventional TV set in a specific place.
- Even during the World Cup the actual time spent watching mobile TV remained significantly below the users' expectations prior to the test. Mobile TV becomes an attractive medium through daily use. It is, however, harder to watch for a long period of time than expected. One may conclude that mobile TV is in principal not suitable for long periods of use although we feel that this is a hasty interpretation. Watching mobile TV is demanding if the viewer wishes to do it in the same manner as watching TV at home. However, the more interesting question is whether mobile TV will develop into a different form of TV viewing, requiring less in the way of continuous concentration and also the possibility of improved with mobile situations of use.
- The format used for broadcasting football matches has special qualities that make mobile TV easier to watch. Advantages include the possibility of quickly tracking the state of play from the current score superimposed on the screen,

action replays of the most interesting scenes and running commentary. The advantages of this type of broadcast enable the programme to be enjoyed as background accompaniment. These aspects are immensely significant for the development of intensive mobile TV use.

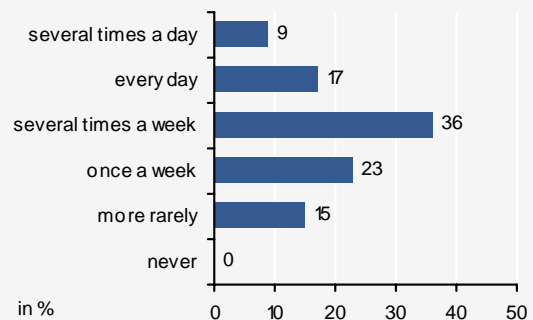
- The possibility of watching TV while travelling provides added scope for organising one's daily schedule and acts as compensation for any reduction in quality and/or the disadvantages of watching mobile TV. A typical example of this is reflected in the following quote as given by the participants: "I don't have to hurry home to catch a particular programme. I can start watching it on my mobile while travelling or watch it outside for a while before going in."
- The extremely good weather during the test period also contributed significantly to mobile TV use while the participants enjoyed their free time. Fine weather can be a significant factor in making mobile TV an attractive proposition. There are presumably other external factors too that make watching mobile TV an attractive proposition in terms of providing added scope for organising one's daily schedule.
- The high level of interest in mobile TV during the World Cup reinforced the use of other contents. The World Cup (and certainly not unlike other media events) had an important knock-on effect. Intensive use of specific contents increased the use of other contents. This is a known effect in TV reception. Based on current findings, however, the question still remains open whether this effect is limited to news and information broadcasts or whether it also applies to light entertainment programmes. This appears questionable especially for contents related to viewer relaxation and distraction.¹⁸

¹⁸ The findings relating to the dominance of news and information programmes in mobile TV cannot be applied to other target groups without further investigations. This applies particularly to younger and/or female target groups. In a qualitative study into the use of UMTS TV services we conducted among teenagers, we found a significant trend among female participants under the age of 20 for escapism in the form of TV series and similar light entertainment watched during the daily commute on public transport and after school.

5. Mobile TV Use in the Second Test Phase

An important reason for watching mobile TV weakened at the end of the World Cup. The extraordinarily high level of use during the tournament returned to a more normal level once the World Cup came to an end¹⁹. The majority of participants did not watch mobile TV every day but continued to watch it regularly a number of times per week. This development in mobile TV use can be regarded as a process of normalisation following a large-scale media event, as is also evident in other media. After the World Cup only a quarter of participants watched mobile TV on a daily basis (several times a day and daily, chart 38). The figure during the World Cup was two thirds (cf. chart 24). The participants' interest in mobile TV did not, however, come to an abrupt end after the World Cup. Two thirds continued to watch mobile TV several times a week.

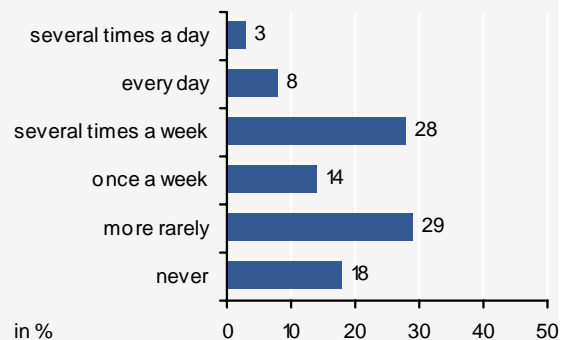
Chart 38: Frequency of use directly after the World Cup (n=182)



As the test proceeded frequency of use did however decrease. At the end of the test only 12% of participants watched mobile TV on a daily basis although 28% continued to use it several times a week (chart 39). If daily and weekly usage is taken together, half of the participants were still watching mobile TV at the end of the test. At the same time 18% of participants ceased using mobile TV in the second test phase or 29% continued watching it but only infrequently.

The second test phase is characterised by the participants testing mobile TV use under normal conditions and seeing how the actual service and programme offer fits in on a personal level with everyday life. We will analyse this process more closely in the following section. At this stage, however, we can say that the development in frequency of use as outlined here shows that the sample group of participants at this phase falls into two equal groups: potential users and those inclined not to use mobile TV.

Chart 39: Frequency of use at the end of the test (n=179)

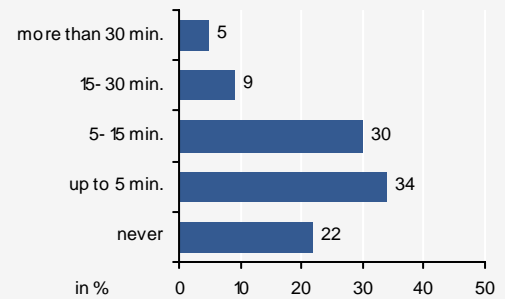


¹⁹ The third questionnaire wave took place in the week immediately following the World Cup.

Usage Time

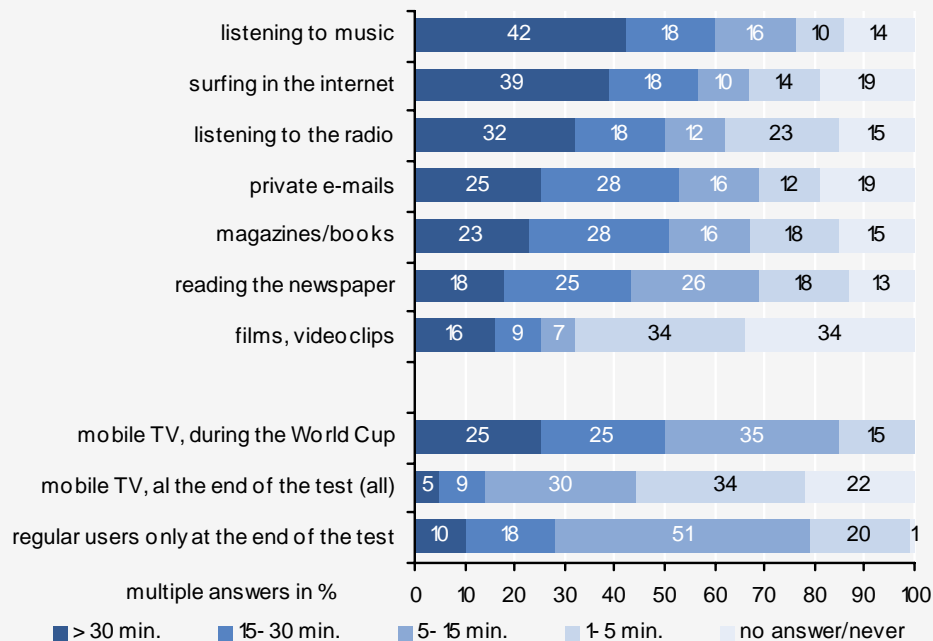
On average the participants switched on their mobile TVs not only less frequently but also for shorter periods of time during the second test phase. The average daily usage time in the second test phase dropped from approx. 15 minutes during the World Cup to approx. 7 minutes by the end of the test. The share of those who watched for longer than 15 minutes fell from 50% during the World Cup (cf. chart 25) to 14% by the end of the test (15-30 mins and over 30 mins, chart 40). Conversely the share of those switched on for less than 5 minutes increased to 34%. By the end of the tests 22% had ceased watching mobile TV altogether.

Chart 40: Use of mobile TV per day (n=177)



The extraordinarily high level of use during the World Cup and the subsequent process of normalisation are evident when compared with other media used while travelling or on the move during the day or at the workplace. The first seven bars on chart 41 indicate the daily amount of time participants spent using various media. The three bars at the bottom of the chart represent the time spent watching mobile TV firstly during the World Cup and secondly at the end of the tests as based on all test persons and only on those test persons who were still regular mobile TV users at the end of the test.

Chart 41: "How much time do you spend using other media if you are on the move during the day?" (n=182, 177, 179, 71)



During the World Cup mobile TV was used for almost the same length of time as other forms of media used throughout the day. Overall, 85% of participants watched mobile TV for longer than 5 minutes on average each day compared with 76% for music and 62% for radio. At the end of the test mobile TV use fell

significantly to 44% of participants compared with other media although this was not the case among 80% of regular users who continued to spend longer than 5 minutes per day watching mobile TV (last bar).

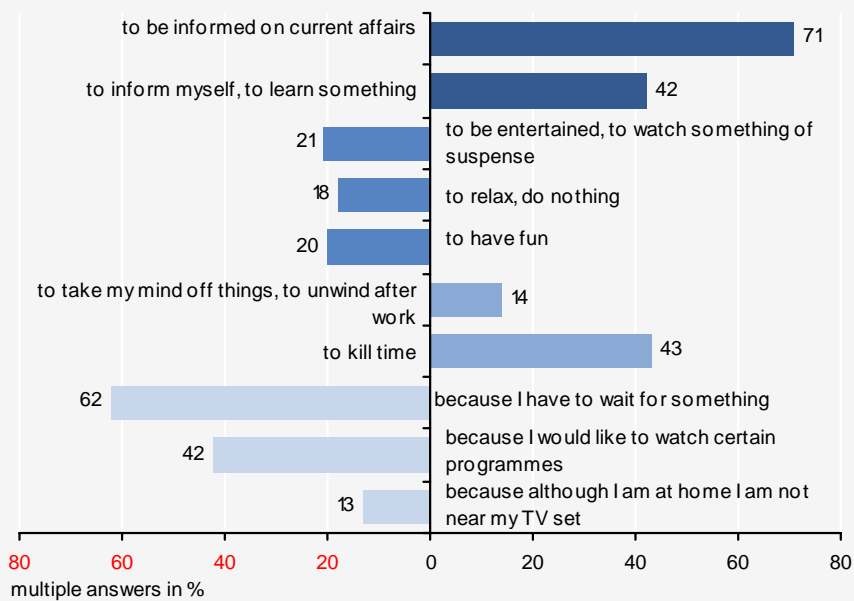
In the following sections we will describe regular user behaviour in terms of reasons for use, situations of use and the contents used during the second test phase.

Reasons for Use in the Second Test Phase

During the World Cup the number one reason for using mobile TV among 91% of participants was “to keep up-to-date with the latest events” followed by “because I want to see specific programmes” at 79% (cf. chart 28). In the second test phase “wanting to keep up-to-date” was still in the number one position but had dropped significantly from 91% during the World Cup to 71%. “Because I want to see specific programmes” fell from 79% to 42% to occupy the middle ground with “filling in time” and “wanting news and information”. In second place with 62% quoted as a reason for mobile TV use was “because I’m waiting for something” (chart 42).

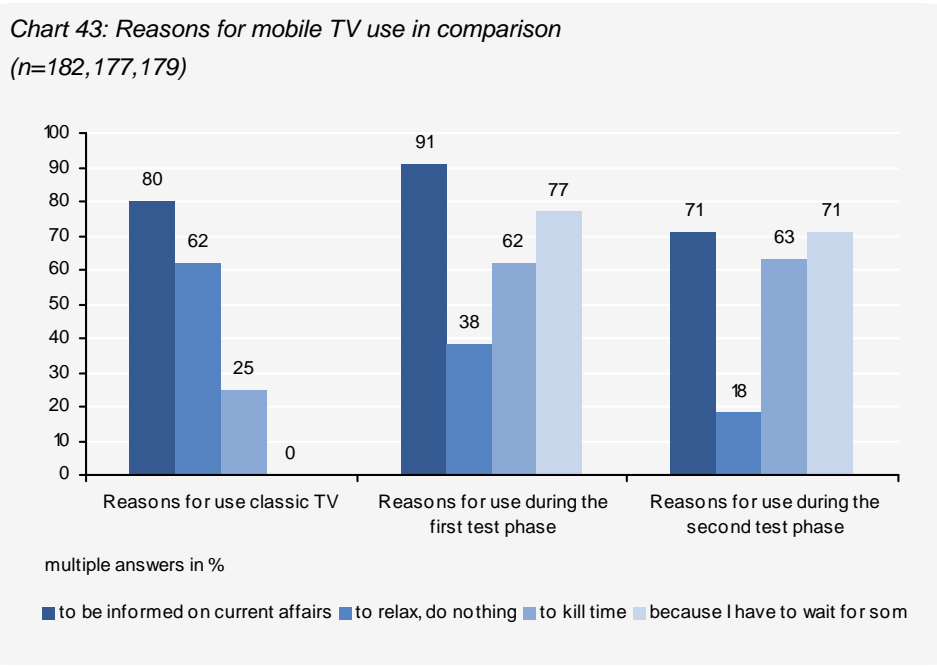
Chart 42: Reasons for mobile TV use in the second test phase

(multiple answers; n=172)



These changes in reasons are due to the fact that “wishing to see specific programmes” became less important. The main reason for this change is undoubtedly due to the loss of many World Cup live broadcasts throughout the day. Interest in news and information then became the dominant reason for use. For many of our participants waiting did not in any way imply that they wanted to fill in time with any programme. We frequently observed that waiting times were combined with a need for news and information.

Compared with the reasons for use in terms of conventional home viewing, it was apparent that “entertainment and relaxation” as a reason for watching mobile TV took on a subordinate role whereas with conventional TV “entertainment and relaxation” are almost as important a reason as news and information. There are above all two reasons for this: firstly, the situations of use are much shorter than the traditional formats for light entertainment and secondly, having to concentrate on the mobile phone for an extended period of time is demanding. One participant described it thus: *“It’s hard going watching TV on a small screen; it’s not relaxing and although the quality is very good I don’t think it’s very relaxing. I wouldn’t sit down to watch it for an hour because it’s just too hard going.”* This experience does not necessarily go against the positive assessment of the display screen but is rather based on anticipated situations of use as reflected in the participants’ expectations of mobile TV use. Even at this stage in the test “entertainment” and “relaxation” were rarely quoted as a reason for use compared with conventional viewing. Chart 43 illustrates the most important reasons for use for a clear comparison. The wish to keep up-to-date with the latest events was consistently at the top of the list.

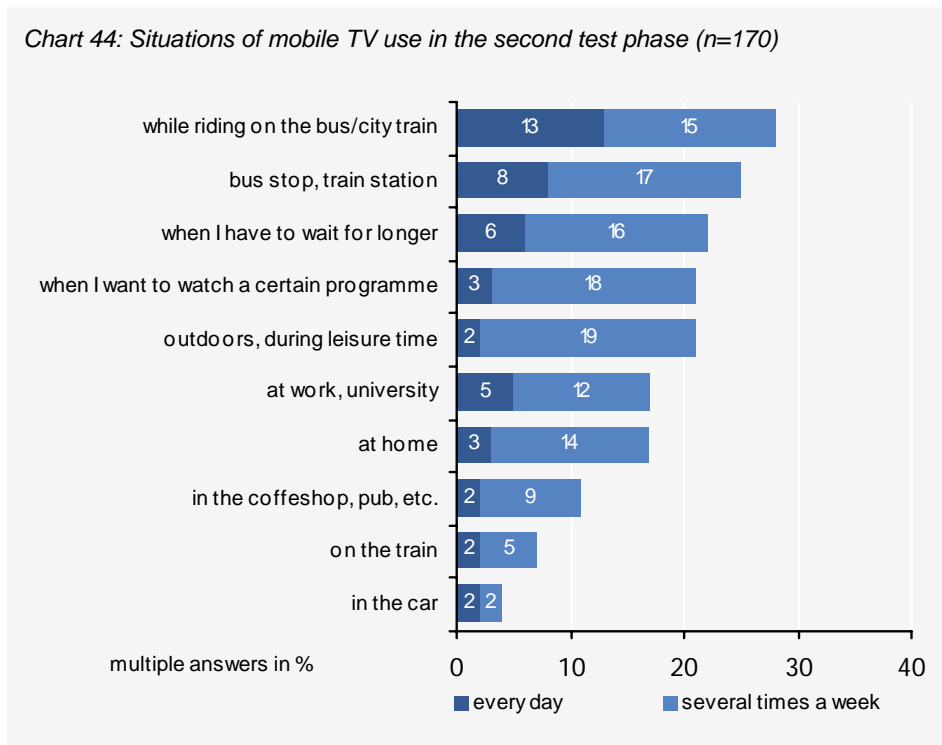


During the World Cup it was the most important reason for watching mobile TV. Compared with conventional viewing seeking relaxation from mobile TV clearly occupied a lower position with 38% of participants quoting it as a reason during the World Cup and 18% by the end of the test. “Filling time” while waiting was the second most important reason given for watching mobile TV.

Situations of Use in the Second Test Phase

In the second test phase mobile TV use focused more heavily on waiting for and travelling by public transport than during the World Cup. (chart 44).

Chart 44: Situations of mobile TV use in the second test phase (n=170)



The daily commute for many participants is a time they would (also) like to use well and mobile TV can also be used as part of this classic time of day for media use. The participants took advantage of watching mobile TV while travelling to keep up-to-date with news broadcasts, documentary reports or magazine programmes. Some participants reported that using mobile TV in the morning either replaced or complemented reading the newspaper. Other participants made use of mobile TV to “watch music” on the bus instead of listening to music or the radio.

Mobile TV use aimed at filling in waiting periods in general was in third place. Many periods spent waiting do not occur regularly but crop up unexpectedly. Unplanned periods of waiting are particularly unpleasant and mobile TV is ideal because the owner generally has his/her mobile phone to hand.

Receiving specific programmes that the viewer would like to see no matter where s/he is at a particular time is in fourth place. Making good use of mobile TV to fill in periods of time while waiting becomes more important once the World Cup induced impetus to watch specific programmes whenever and wherever wear off.

Interestingly, watching mobile TV during leisure time is in fifth place, coming before “during work” and “at home”. Examples include walks in the park, time spent with the family and at the swimming pool. In sixth place and as already mentioned comes the workplace or university. Many participants spend their working day in front of a PC and use the internet as a preferred source of news and information only replaced by mobile TV should the internet go down.

Mobile TV appears to be at best an attractive additional or accompanying medium. Students used mobile TV somewhat more frequently at university where access to PCs and the internet access were not was not continually available.

Mobile TV is used at home almost as frequently as at the workplace, although not on a daily basis compared with conventional TV but as specific occasions arise. The younger participants and/or students living in shared accommodation used mobile TV at home so as not to disturb fellow housemates at specific times or because there was no TV in the kitchen. Almost half of “home use” during the test took place outside on the terrace, balcony or garden. The extremely good weather again played a crucial role throughout the entire test period. Having mobile TV meant that participants could enjoy the good weather and not forego early evening TV series or the main news at 8pm.

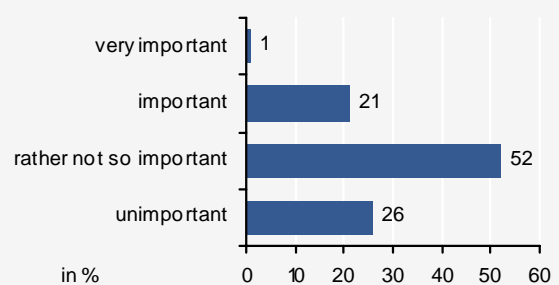
By comparing both tests phases it is possible to summarise by stating that the incentive to use mobile TV in the second test phase was heavily influenced by specific situations (especially the daily commute) and not by the wish to watch a particular programme while on the move. What is striking overall is that mobile TV use in all situations is clearly some way behind the participants’ own expectations. Almost all participants (93%) expected to use mobile TV on the bus, suburban rail network or underground and while 60% did so (29% on a daily basis and 31% several times a week) during the World Cup this figure dropped to just under 30% in the second test phase even though this was the situation most frequently used by the participants.

If the argument is correct that watching mobile TV is a particularly situation-based occurrence in which the user is not (fully) occupied throughout the day and where there is no external impetus from a media event, then it is questionable whether situation alone is enough to encourage mobile TV use based on the findings related to situations of use as indicated above.

Watching mobile TV remained an additional feature for the majority of the participants in the second test phase. Participants enjoyed using it as the opportunity arose, but they did not feel it was important (chart 45). It is a good add-on feature but is not essential.

The programme content on mobile TV is subjectively important to the participants. This then gives rise to the question of whether the type of programmes on offer is attractive enough from a participant’s point of view in order to establish mobile TV as a medium.

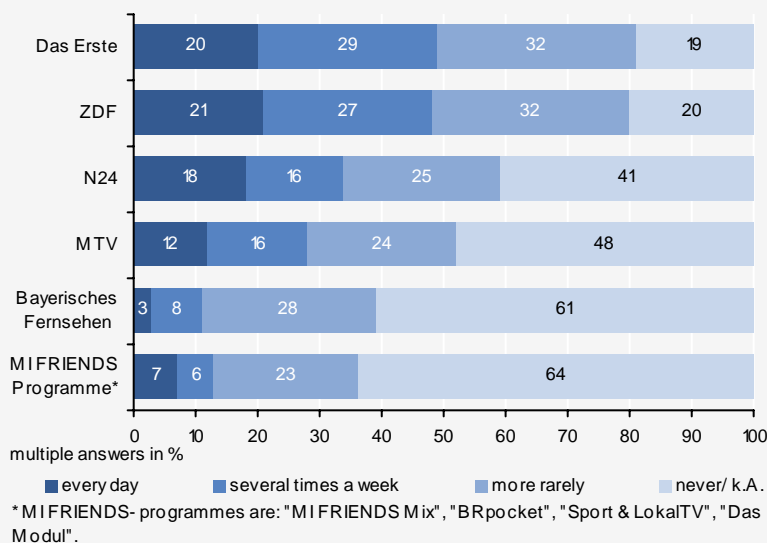
Chart 45: After several weeks of testing mobile TV, how important do you think watching mobile TV is to you? (n=180)



Programme Offer Use in the Second Test Phase

Those TV channels known to participants from conventional viewing were at the forefront of mobile TV use. ARD and ZDF were watched the most frequently, followed by N24 and MTV (chart 46). The cross-media presence of the established channels obviously speaks for itself and mobile TV use reinforces the effect of this strong media presence because participants do not want to spend too long searching in the comparatively short periods of use but select the channel they already know and normally watch. ARD and ZDF were watched by approx. half of the participants at least several times a weeks and N24 by a third. In fourth place came MTV with 28%.

Chart 46: Which mobile TV programmes do you watch and how frequently? (n=181)



The order of popularity did not change after the World Cup despite the fact that World Cup matches were no longer part of the schedule on the national channels. However, the share of daily users had roughly halved. The gap between the two major broadcasters and the other channels narrowed. Overall, use of the channels was less compared with the first phase.

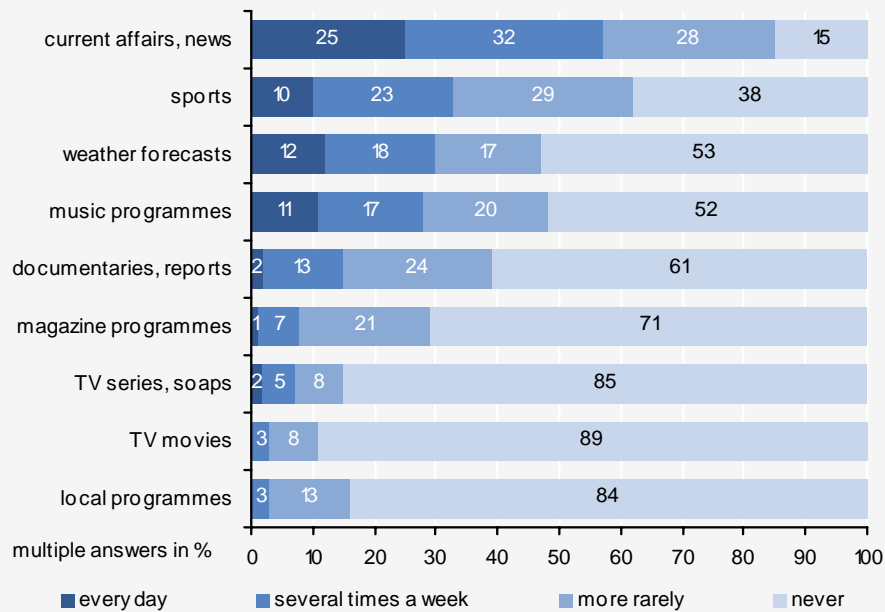
The picture remains virtually unchanged when period of use is considered. A small proportion of the participants (up to 10%) spent more than 15 minutes a day watching the first four channels listed on the above chart. MTV was slightly ahead of the first three channels in terms of longer usage time since music videos are more frequently watched and listened to in the background for longer periods of time. Approximately 30% of participants watched ARD and/or ZDF for between 5 and 15 minutes per day and 23% and 16% watched N24 and MTV respectively for the same period of time.

News and information programmes were at the top of list in terms of programme content. Interest in up-to-date news programmes was delivered to participants by trusted broadcasters such as ARD, ZDF and N24 as we have seen. News and information programmes come top of the list in terms of programme type (chart 47). In second place are sports programmes including after the World Cup. Weather forecasts and music programmes were in third

5. Mobile TV Use in the Second Test Phase

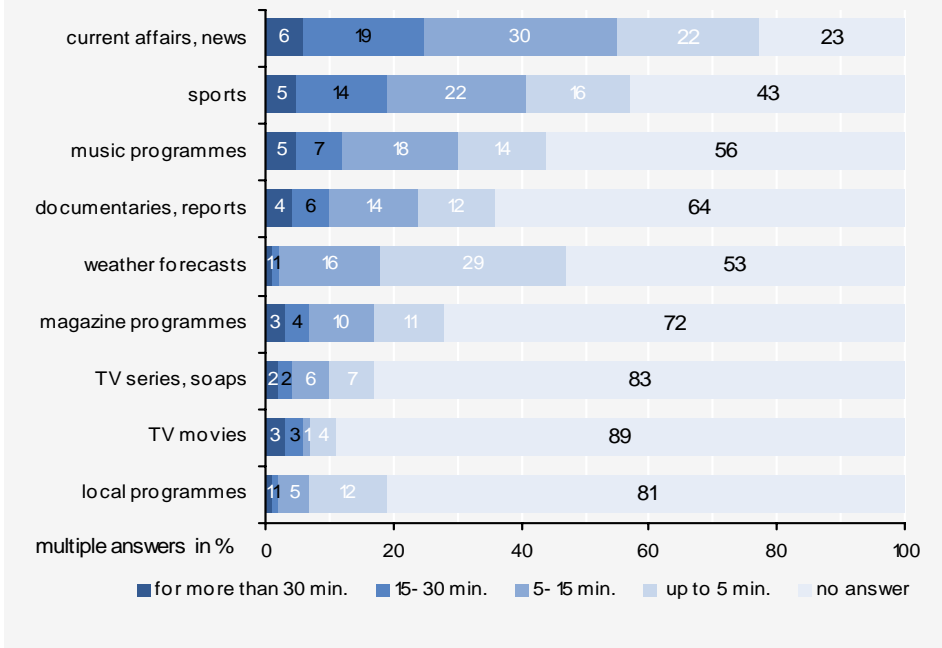
and fourth place. After a significant gap come documentaries, investigative journalism and magazine programmes watched on either a daily basis or several times a week. Light entertainment plays a subordinate role in mobile TV use. It must be noted, however, that the major private broadcasters with their up-to-date selection of feature films and TV series were not included in the test package.

Chart 47: „What do you watch on the mobile phone? How often do you watch this programme?“ (n=180)



Another interesting aspect is the comparison to the traditional media use. As we have outlined in section 1, although the participants in our sample were most information orientated, as far as the apportionment of traditional TV watching motives were concerned they were rather similar to comparable groups (educated, younger, technology-affine groups), also pursuing entertainment and relaxation motives. Only “time fillers“ and distraction were of little importance to the test participants (and their comparative groups). The orientation towards information, but not the orientation towards entertainment was transferred to mobile TV watching. Also, when studying the use for three days the using pattern reproduced itself (Chart 48).

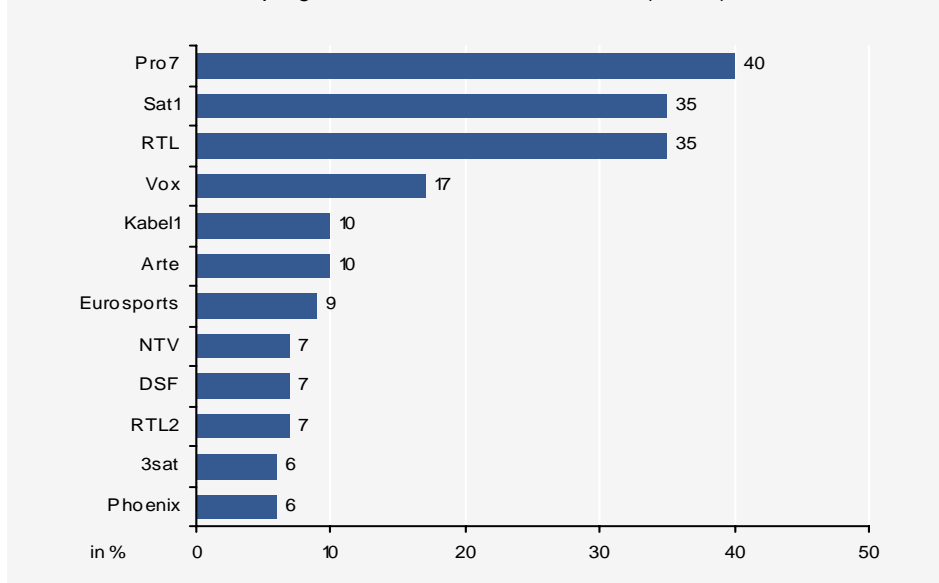
Chart 48: „What do you watch on your mobile phone? How long for in total over a period of 3 days? “ (n=180)



The key genres used on a mobile phone are news, sports, music, and reports. However, at the same time the percentage of longer use (longer than 30 minutes) which may be small but still exists shows that more intense use occurred too, and that this more intense use included entertainment genres (for comparison see paragraph 6).

As for entertainment genres, the findings on the use of the available programmes and stations suggest that it is the programme offer which shows deficits. The answers to the question “Which other programmes should be available?” confirm it (Chart 49). The resulted was a long list of additional programme requests. 40% of participants missed Pro7, more than one third Sat1 and RTL. All other programmes requested followed at a considerable distance.

Chart 49: Which other programmes should be available?“ (n=179)



In total this wish list of programmes prompts the question whether or not the absence of important programmes, and also certain programme deficits are responsible for the major slump in the intensity of use during the second phase of the test and the infrequent use of entertainment programmes. However, the fact that before the start of the test the participants had claimed that they expected to rather rarely use entertainment genres contradicts this assumption that the availability of the above programmes would boost the intensity of use considerably. In order to get closer to this issue we checked whether or not rare users missed these broadcast stations more than regular users; whether or not they watched less mobile TV because they missed these offers. However, this suspicion was not confirmed - to the contrary, regular users missed the large private broadcast stations more than rare users.

Nevertheless there is a definite limitation to the findings described above: We can not tell on the basis of this empiricism what the apportionment between information- and entertainment programmes would have been like if the large private stations had been part of the test.¹⁶ Most likely entertainment genres would be more important because the missing stations Pro7, RTL, and Sat1 offer the most popular entertainment programmes for our sample's age groups. The answer to this question requires another study which includes the above broadcasting stations.

The Decision Process: Regular vs. Rare Viewing

During the course of the second phase of the test the participants went through a process of deciding for or against the further use of the test offer which was based on their daily mobile TV watching experiences. This decision was not final, and in general it was not even clear (see using intention below) – it

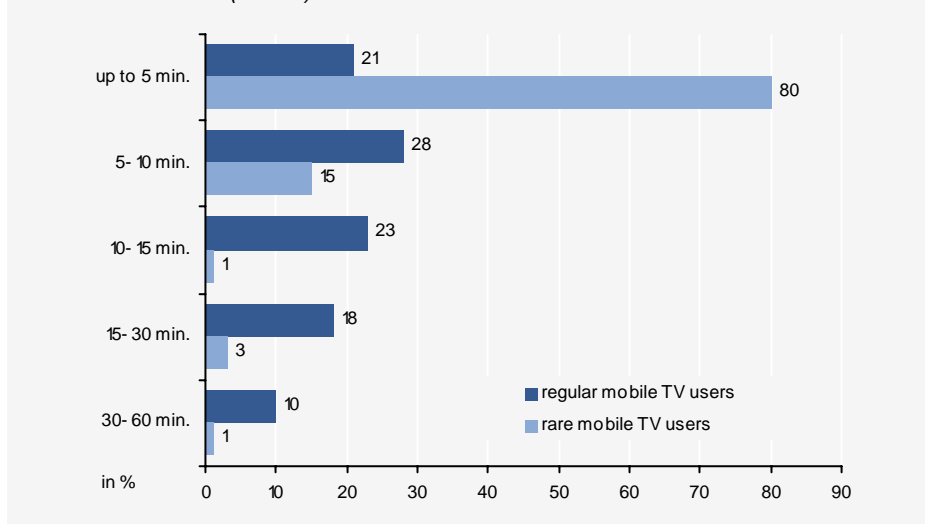
¹⁶ In principle there would have been a chance to include a programme offer compiled by Pro7/Sat1 especially for mobile viewing because this programme is broadcast in Munich by MFD, the commercial provider of DMB-based mobile phone TV. Unfortunately for technical reasons there was not enough time to get it activated for the participants.

developed out of the everyday experiences. First of all it became apparent that the mobile TV watching periods of one group of participants grew shorter and shorter. They kept trying it here and there but spontaneously they did not “get stuck” anywhere. One tried it here and there but spontaneously did not „get stuck“ anywhere. If one did not find anything of interest during the first five minutes one switched off, or one found out that one’s daily routine did not offer any situations which were suitable for watching TV on the mobile phone. Other participants at least occasionally found something interesting and suitable to their daily routine. These participants did not switch off straight away, they kept using the service regularly or used it at least several times per week. During the second phase of the test the sample of test participants broke more and more into one half of relatively regular users and a second half which had decided more or less against the use of mobile TV.

Regular users not only watched TV on the mobile phone several times a week but also used the service clearly longer, on average 15 minutes per day. During the eight weeks of testing they developed initial using habits.

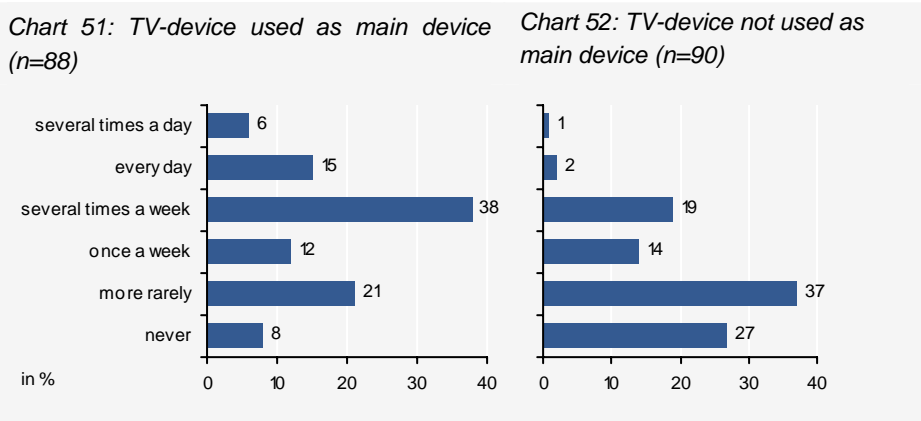
The opposite group of participants who by then only rarely used the TV option on their mobile phones consists of those who switched off after a few minutes or had given up on it completely. A comparison of the regular users’ daily using times („daily“ and „several times a week“ use, n=71) to the one of the rare users („weekly“, „rarely“, „never“; n=106), shows that the short using sequences of less than five minutes were found predominantly in the latter group (Chart 50).

Chart 50: Length of using mobile phone TV: regular users vs. rare, i.e. non-users at the end of the test (n=177)



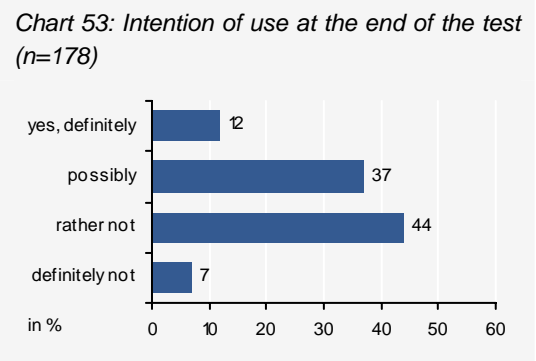
Another important factor for the decision process was the test device the participants were supplied with. Towards the end of the test one half of the participants did no longer use the supplied TV-compatible mobile phone as their main mobile phone but only to watch TV on it. This group’s participants went back to using their own mobile phone for the traditional services, and because of this they did not automatically take along the mobile TV phone everywhere they went. They took it only when they had decided in advance that they would watch TV en route. In fact, this happened rarely then. As a

consequence it happened quite frequently that they did not have the test device with them when spontaneously a situation came up where they would have liked to watch TV. When comparing the frequency of use of those who used the TV-compatible mobile phone as their main, i.e. number one device with the frequency of use of those who finally used it for TV watching only we see a distinct polarization (Charts 51, 52): Most of the participants who still used the TV-compatible test device as their main one watched TV on their mobile phone at least “several times a week”.



Contrary to this the participants who did not carry the test device with them all the time hardly or never used the TV – service. Functionality and design of the test device were important factors for this decision (also see paragraph 8), offsetting the advantage of mobile viewing being available as an add-on feature for spontaneous use which does not require any extra effort (like, for example, the camera feature integrated in mobile phones). At this point at the end of the test we have to state a negative effect which occasional users experienced which is due to the conditions of the test. Occasional use had the effect that the TV-compatible mobile phone was no longer used as the main device. In our test scenario occasional users eventually became non-users. However, this will not necessarily be the case when the conditions are real, because normally the TV-compatible mobile phone will be used as the main phone if a service which is liable to costs is used.

The diverge of the participants' sample of one group of regular users and an opposite group showing a tendency towards becoming non-users was substantiated by the using intention analysis. Here, the sample broke into half with one group of participants who in future definitely or possibly wanted to use the TV - feature and the other who did not intend to or categorically refused to (Chart 53). During the World Cup 77% of participants still had represented that in future they wanted to use the TV feature (compare Chart 35). However, the vast majority alternated between „possibly“ and „rather not“. Even at the end the percentage of participants who definitely did not have any intention of using the TV feature was very small (7%).

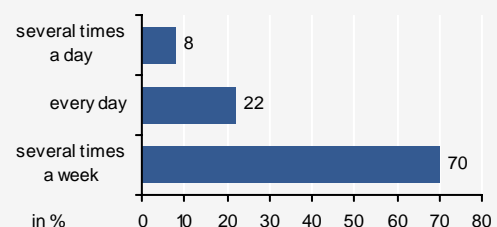


To a large extent this decision was influenced by specific day to day experiences. Unfulfilled expectations of the service and the mobile phone came into this as much as the realization of whether or not the TV-compatible mobile phone was actually used or finally left in some drawer. In section 9 we will revert to this issue. Right now our main concern is to give reasons why it makes sense at this phase of the test to not only look at the average values relating to all participants but also to compare the two groups of the test sample with each other. In the following two questions interest us: What actually makes the difference between regular users and non-users? Once we have established what it is this might help us to define the target group for mobile TV offers. – And secondly: What and which way do the regular users watch on the mobile phone? Because during the course of several weeks eventually daily using patterns began to take shape within the group of regular users. To these participants mobile TV slowly became more than just an add-on-feature for occasional use. In the next paragraph we want to examine their using habits more closely so that we will be able to establish what an attractive offer to this target group should be like.

6. Regular Use of Mobile TV in the Second Test Phase

What characterises regular users? What distinguishes them from the other participants? What do they watch on their mobile phone, in which situations and for which reasons? For the first phase the answer to this question is based on the test result of the regular users (see Chart 54, n=71), and for the second phase on the logs (also n=71)¹⁷ we had imposed from Monday to Wednesday of the last week of July, and in addition for both phases on the focus group discussions (n=65). We can interpret the results of the interviews with the regular users and the results of the logs together because apart from very few exceptions a participant who rendered information on the use of mobile radio and TV use in the log was part of the group of regular users.

Chart 54: Frequency of use at the end of the test – regular users only (n=71)



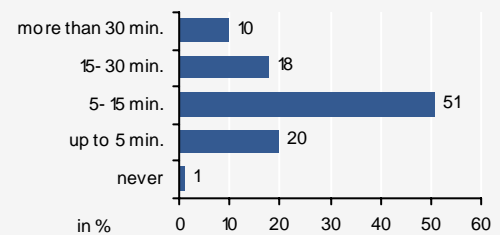
¹⁷ In fact there were a few log candidates who classify themselves as rare users in the questionnaire. On the other hand some regular users were not able to render any information because it just happened that they did not use the service on these particular days (for example, because during this period they were not in Munich).

As the test came to an end to most participants “regular use” did not mean that they were watching TV or listening to the radio every day. Only just about one third used the device on a daily basis, two thirds used it several times per week (Chart 54).

Also amongst regular users the average viewing time was rather short, it lasted between 5 and 15 minutes. Anyhow 28% watched for more than 15 minutes (Chart 55).

In this group the tendency towards future use was especially strong. Two thirds of the regular users wanted to carry on using the service once the test had finished. 40% claimed that in future they will use the service “rather not / not at all”. One out of five regular users claimed that they wanted to “definitely” use the TV feature in future (Chart 56).

Chart 55: „During the past two weeks, how long did you watch mobile TV on average per day?“ (n=71)

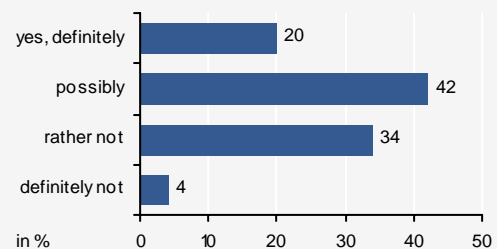


Using Pattern of Regular Mobile TV Users

As far as their socio-demographic characteristics are concerned, regular users were not much different to those who “rarely / never” used the TV feature. The main difference between regular and rare users was that in the group of regular users there were 10% more students and respectively less employees. At university students used mobile television more often than employees did at work. The focus group discussions showed that to many employees the internet is constantly available at their workplace and they prefer it to mobile TV as a source of information. Apparently in our early adopters sample not the differences in gender, age, education, or income decided on whether or not a participant wanted to watch mobile TV. The only indication of differences was found with students vs. employees. Employees used mobile TV at work more rarely than students did at university, one reason being that often they had to attend to different tasks and to move to different locations. Therefore, when looking at it closely, not the difference in status but the difference in daily routines was responsible for this discrepancy.

Also, affinity towards technology turned out not to be a criterion for the differentiation between regular and rare users. During the initial phase of the test there was a distinct interrelation between a high level of affinity towards technology and intensive use. This coherency became less apparent as the test came to an end. Especially the participants with an affinity towards technology were not represented more in this group than in the overall sample. To some extent technology-orientated test persons lost interest as the novelty of the mobile TV phone wore off, and some of them were extremely dissatisfied with the device because its functionality in regard to sophisticated features did not meet their expectations. At the same time the reservations of a few less technology-orientated participants towards this new technology subsided after

Chart 56: „Do you think that in future you will want to watch TV on your mobile phone?“ (n=70)



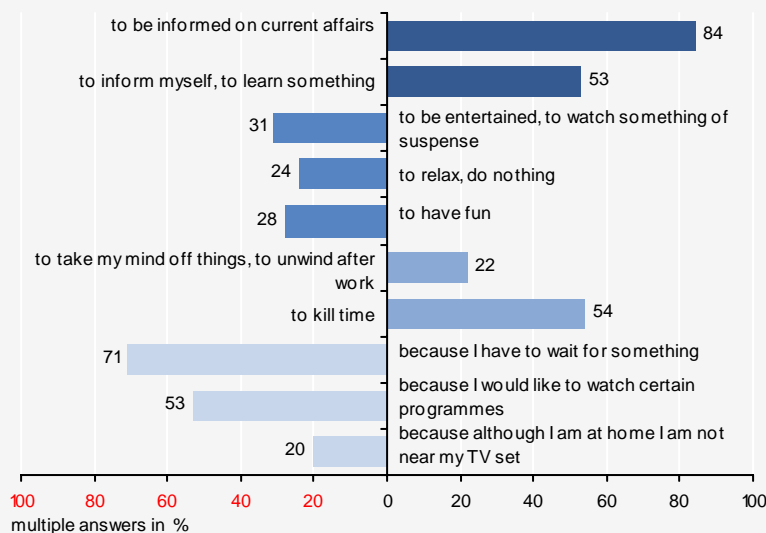
6. Regular Use of Mobile TV in the Second Test Phase

they had found out that the TV functions were user-friendly. Apart from this they used the device mostly for calling and writing messages.

Even the general use of the media and the traditional viewing habits did not have a differentiating influence on mobile TV watching. Normally people who do not use the media much would rarely use the TV feature on the mobile phone, either. If you hardly ever watch TV you will just as hardly ever do it on the mobile phone. Both in the sample and the overall population the percentage of “media objectors“ is extremely small. However, an interesting finding is that traditional „marathon watchers“ less often became regular mobile TV users: One who watched TV at home a lot and also for long periods watched it less on the mobile phone because the mobile phone was no more than a substitute in situations when no “normal” TV set was available. At the same time this interrelation is not distinct enough to be verified statistically by our data.

Now since the socio-demographic characteristics have contributed little to the explanation of the decision for or against the use of the mobile phone’s TV feature we will look at reasons for usage and using situations, and at the contents. Do regular users have specific **reasons for use**, or do certain situations occur more frequently here than they do with rare users? Regular users feel a strong need for information: 84 % want to stay updated on current events and 53% want detailed information. On the other hand so do rare users (chart 57).

Chart 57: Reasons for watching TV on the mobile phone during the second test phase (multiple answers; n=68)



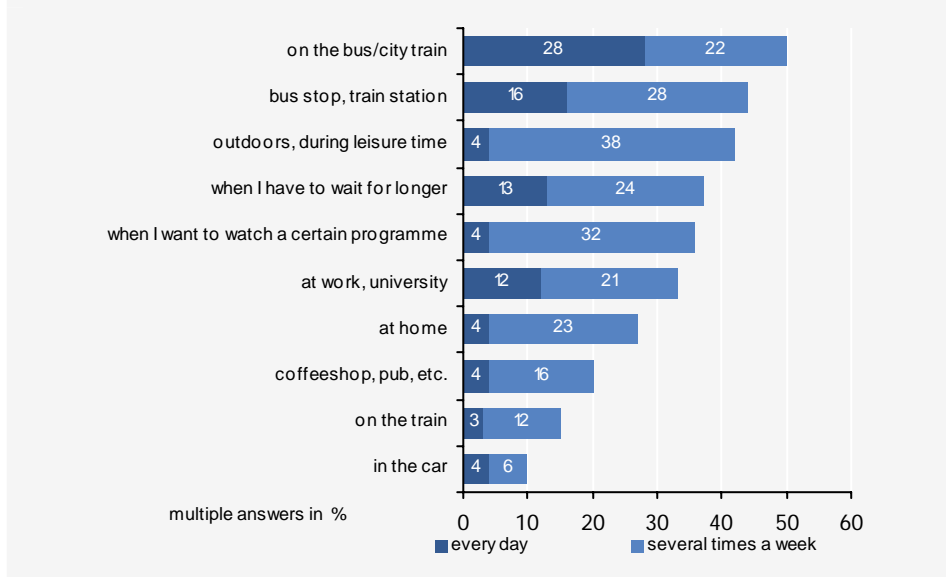
In this context it should be noted that the information related reasons grew much stronger compared to the results of the survey before the test. At the end of the test the members of the group of regular users mentioned “to get informed, to learn something“ twice as often (53%) as they had done during the expectation period before (20%, comp. chart 20). The participants’ orientation towards information was reinforced by the experiences during the test because the news bulletins and informative programmes are the genres which are suited

best to the mobile phone and fit well to the key situations in which it is used. At the same time the low expectations of mobile TV in regard to the entertainment and relaxation value were confirmed, intensified by the limited light entertainment offer due to the absence of major private entertainment stations. Within the group of regular users the motives “entertainment” and “relaxation” are mentioned frequently but they carry no weight in proportion to the strong desire for information and the wish for filling in waiting periods (between 31% and 22%). The same applies to all the other participants.

Consequently, as far as reasons for using are concerned we can establish that the reasons “information” and “entertainment” were much more developed amongst regular users but a fundamentally different pattern was not observed (chart 57).

This applies also to the **using situations** - all situations are quoted more often by the regular users (Chart 58). The conclusion is that regular users are more often in situations which suit the use of mobile TV reception. For example, we have learnt from the focus group discussions that during the course of the test particularly people commuting by car turned into non-users because they missed out on an important situation where they might have wanted to use the service. During their car rides they preferred to listen to the radio. Something similar applied to those commuting by bicycle, although some of the latter used their mobile DMB phone to listen to DAB/DMB stations while riding their bike.

Chart 58: „In which situations did you watch TV on the mobile phone during the past couple of weeks?“ (n=69)



Amongst the regular users especially the high using rate during leisure time stands out. Although this does not happen every day it still is the “several times a week” situation which gets mentioned most often. Leisure time use is particularly interesting during the summer. Still it seems to make sense to generally pay more attention to it. Apart from this there were no particular preferences of regular users compared to the other users. Instead, all potential using situations during the course of a day seemed to be more important. When comparing to the expectations it should be noted that due to the limited

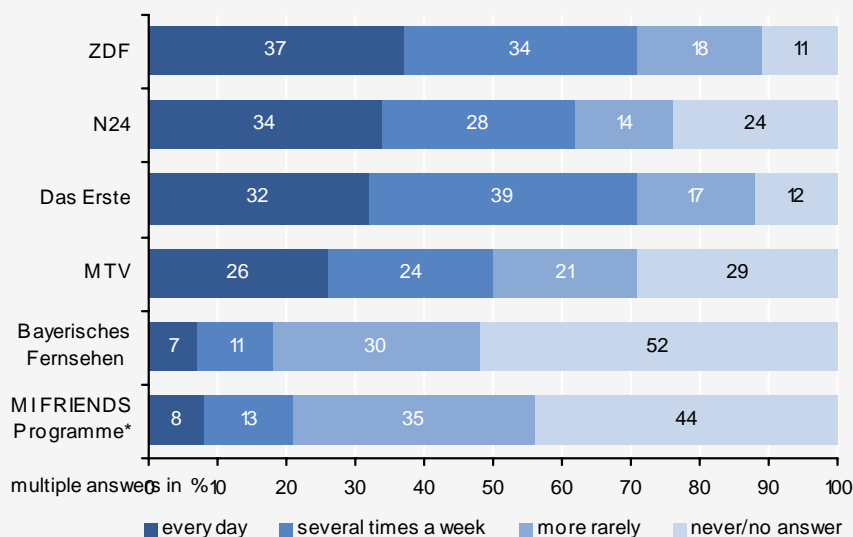
6. Regular Use of Mobile TV in the Second Test Phase

broadcasting range the situations which were mentioned most often, “during longer train rides“ and “as a passenger in the car“, finished last in the test. This limitation was often described as a serious deficit of the test offer (also see paragraph 9); incidentally this applies to travelling and holidays too.

The bars in chart 58 are subdivided into daily use (light) several times a week (dark). When looking specifically at the light parts of the bars it becomes apparent the there are situations during which mobile TV reception manifests as a daily routine: during everyday “commuting”, “at work”, “at university”, and “every time I have to wait“. In other situations usage depends much more on the circumstances. Typically this applies to the use during leisure time, but also to the use of the mobile phone’s TV feature at home. In both cases wanting staying outdoors because of the nice weather was an important reason in our test. For the open answers showed that at least half of the using situations at home are being on the balcony, the terrace, or in the garden.

Regular users watched the same programmes as the other participants but they did more often during the day (Chart 59). Especially N24 was watched every day by one third which fit the strong orientation towards information.

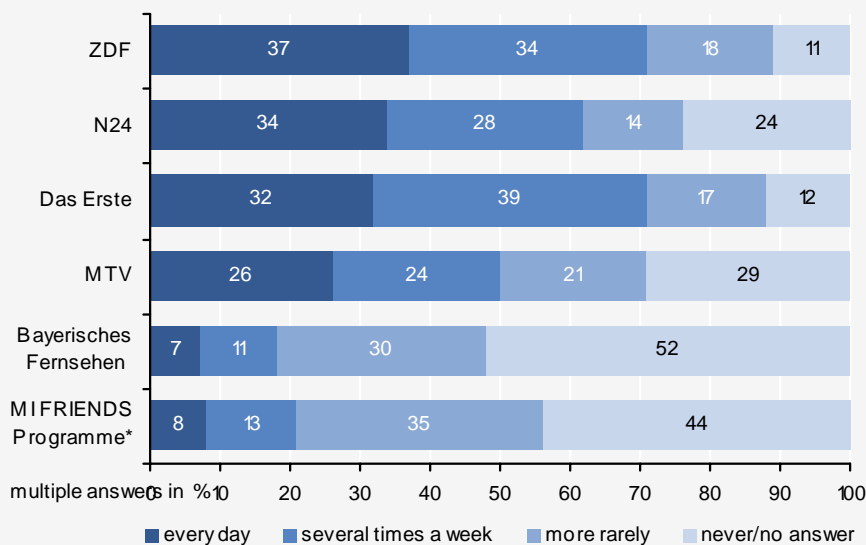
Chart 59: „Which mobile phone TV programmes do you watch?“ (how often, n=71)



* The MIFRIENDS offer consists of "MIFRIENDS Mix", "Brpocket", "sports & LokalTV" and "Das Modul"

The strong orientation towards information became apparent also when looking at the different **programmes**. More than 80% of the regular users watched news programmes, 40% on a daily basis, and another 43% at least several times a week (Chart 60).

Chart 60: „What do you watch on the mobile phone? “ (how often, n=70)



* The MIFRIENDS offer consists of "MIFRIENDS Mix", "Brpocket", "sports & LokalTV" and "Das Modul"

Music programmes finished second – although at a great distance after the latest news - but eventually they became more important to the regular users. For comparison: During the World Cup phase they were on fourth place (see chart 34), the same as in the expectations before the test (see chart 21).

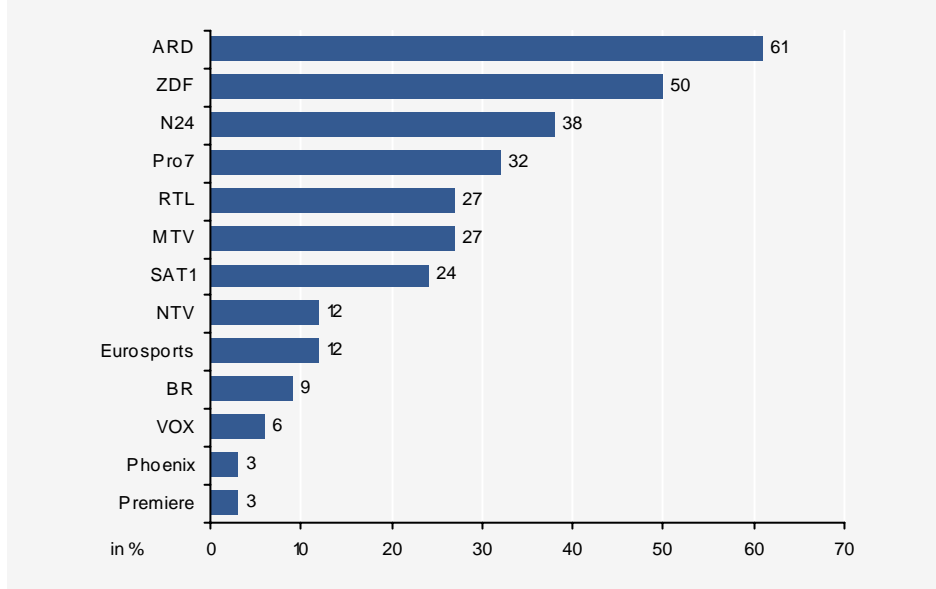
The meaning of TV music programmes becomes even more apparent when comparing the programmes watched on the mobile phone with the programmes the participants normally watch on TV. At home only 18% of the participants regularly watch music programmes (see chart 16), but almost half of the regular mobile phone TV viewers frequently watched music programmes on the mobile phone (Chart 60). Also sports were important to the regular users, followed at a distance by three more information genres: one quarter frequently watched reports (26%), economic magazines (20%), and magazines on general topic (18%).

Regular users distinguished themselves from rare users by having found two genres they wanted to watch on the mobile phone. Of these two the reporting of current issues was the most popular by far. During the second phase it replaced the World Cup as an incentive to the regular users for mobile TV viewing. These results of the standard survey were substantiated by the open answers and the focus group discussions. Also the regular users enjoy music as a side medium and for a short-time entertainment while they are waiting. It seems interesting that both genres are audio-visual, i.e. you can listen to important parts of the content.

Finally there remains the question of which ones the regular users would pick if they could select their four favourite stations. This is a particularly interesting question because in this case the major private providers would have been represented in the test and Pro7, RTL, and Sat1 play an important part to the age groups of our sample. Unchallenged leaders of the regular users' favourite stations were ARD (61%), ZDF (50%), and N24 (38%), followed at a distance

by Pro7 at 32%, RTL (27%), and Sat1 (24%) (chart 61). At the same time it is remarkable that MTV was mentioned only after the private entertainment stations.

Chart 61: „If you could select four programmes for mobile viewing, which ones would that be?“ (n=68)



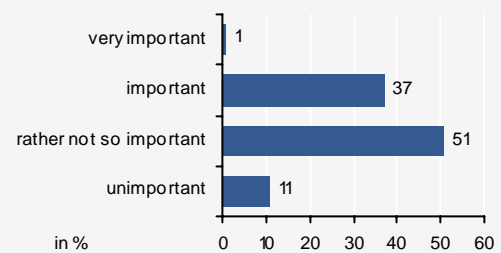
This suggests a trend towards increased use of entertainment which used to concentrate heavily on music programmes. The predominance of the public service stations and the strong position of N24 rather contradict the theory that the availability of additional attractive entertainment offers on the mobile phone would decrease our group's strong orientation towards information. However, the final answer will be found only in additional studies. On the other hand, from our point of view there are two reasons which might contradict this: First of all, the participants' expectations before the test, i.e. before they knew which stations they would be able to watch on the mobile phone. Here, light entertainment programmes had a rather low rating already (22%, i.e. 14%, compare chart 20), although they were important to the participants for traditional TV watching (58%, i.e. 62%, comp. chart 15). We would argue that there are a number of good reasons for this reserved attitude, for example, the display being too small, the format being unsuitable, lack of time during the day and no interest in a demanding type of entertainment; information formats were judged as being better suited and can not be replaced by more attractive entertainment offers. Our second argument is that quite surprisingly the using patterns described for mobile viewing match other forms of mobile media use during the day – for example, the radio.

Recapitulating, we would like to establish that in our sample the decision whether or not to continue watching mobile TV after the World Cup had finished depended less on socio-demographic characteristics like gender, status, or income but rather on the occurrence of situations during the course of the day when watching TV on the mobile phone was an appealing way of spending one's time, and if at the same time contents were found which one wanted to watch on the mobile phone. Then mobile viewing was experienced as an extension of the scope of action in everyday life. For example, if it happens

often that one is still on the move when the news are on one can watch them now, and this was not possible before. On the other hand, the reason why the other participants became non-users was not based on lack of interest, they simply found out that there were no gaps in their daily routine which they would have liked to fill with TV - watching.

What made the regular users of mobile TV stand out was the fact that watching mobile TV gained importance in their everyday lives. At the end of the test almost 40% of regular users felt that mobile TV was important (chart 62), 15% more than the average of all participants (compare chart 45). The focus group discussions and the open answers in the questionnaires give different indications of a new form of "watching TV on the move". One participant expressed it like this: "Yes, *this is road-TV and not home-TV. The values are different. I want the road-TV feature for my multi-functional device.* "

Chart 62: „How important is the possibility to you to watch TV on the mobile phone now after you have tried it for several weeks?“ (n=71)



Participants who stayed regular mobile TV users during the second phase did not differ from non-users because of totally different using patterns but rather because they had developed mobile TV viewing habits. In this group the specialties of mobile TV reception were more distinct and consolidated in form of regular using patterns. The development of regular using pattern is demonstrated very clearly in the evaluation of the daily logs.

Regular Use during the Day

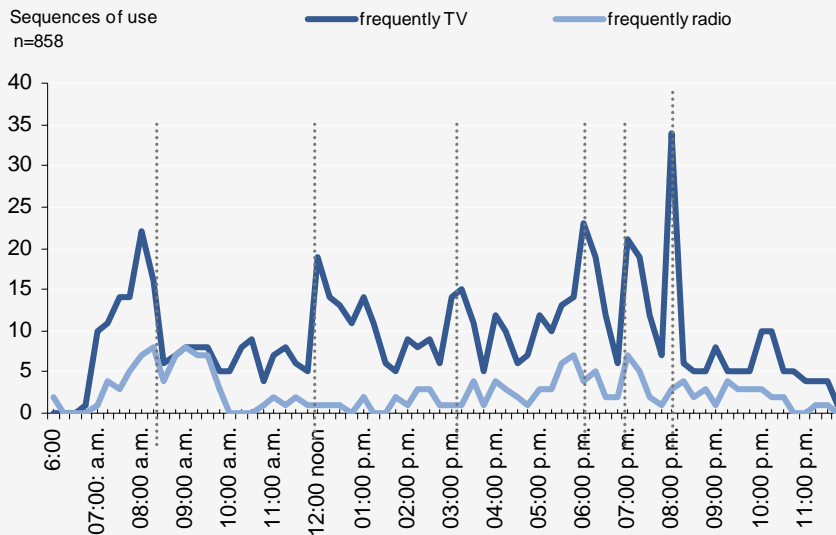
We asked the participants to record their use of the mobile phone's radio and TV offers in daily logs on three consecutive days (24./25./26.07.06). For each interval of 15 minutes they recorded if they watched mobile TV or (DMB/DAB-) radio, what they watched (if it was several programmes, they were to record them individually), and in which situation, i.e. location. In the following charts all the sequences were analysed and displayed on a time axis in the dimensions mentioned above. As we would like to demonstrate below, this results in graphs of daily use which display rather clearly in which way in which way regular users integrated the new possibilities in their everyday lives.

The graphs of DMB/DAB radio- and TV-programme use on the mobile phone (chart 63) are influenced by the workday routine, the change of location linked to it, and the times the main news were on. Four main periods of heavy TV use are showing here (dark blue graph in chart 63).

- The first peak occurred in the morning between 7 und 9; as we will see later, at first while still at home and later mostly on the way to work.
- The second peak occurred during the lunch break between 12 and 1.30 p.m., followed by a slightly shorter (break-) peak around 3 p.m.
- In the late afternoon at about 5 p.m. another rally started, again showing heavy peaks at every full hour when the evening news was on; use was especially intense on the way home.
- In the early evening use of the mobile phone's TV feature started to subside, after 8 p.m. it went down to a low and stayed there for the rest of the day.

- The radio (chart 63 bright blue graph) was used much less than the TV feature with a typical peak in the morning and several slight strikes in the early evening. It is important to consider for interpretation purposes that only the data of the DAB and DMB radio use on the mobile phone were collected, no other form of radio use is included.

Chart 63: Mobile TV and radio use during the day
(71 participants, 858 sequences)

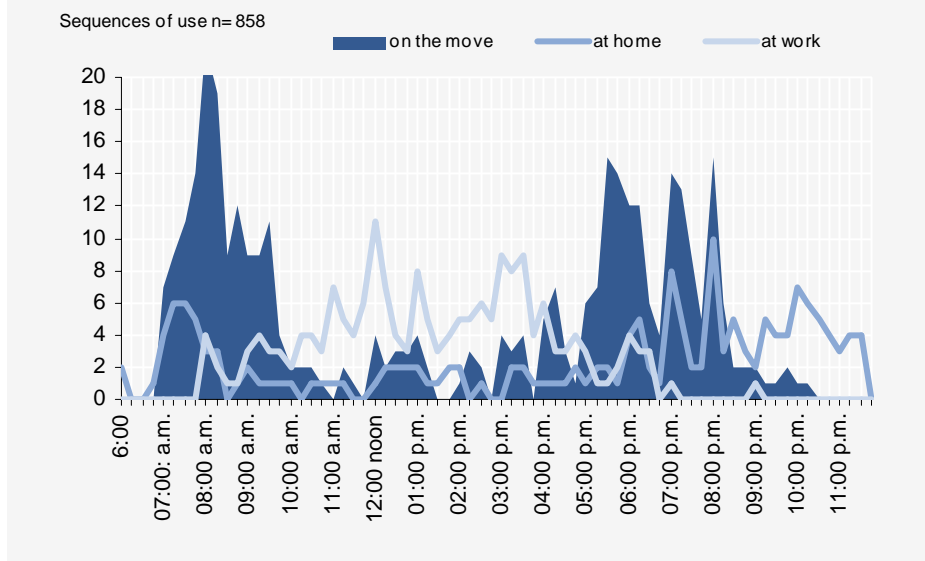


During the course of the day the overall TV graph showed two characteristics which were typical of the pattern of mobile using: First of all, the integration of mobile TV into the daily schedule, and secondly the significance of news programmes (to be seen in detail in charts 66 to 69). News programmes were responsible for the graph's major strikes at each full hour. In the following three graphs are divided into situations of use and broadcasts.

Patterns of Use during the Day - Situations of Use:

In chart 64 the daily use is divided into situations of use at home, on the move and at work or at university. The details in 15-minutes-intervals on situations as recorded in the logs were coded and used for this. Breaks were included in the "at work /at university" category even if the participants were not at their actual work place then.

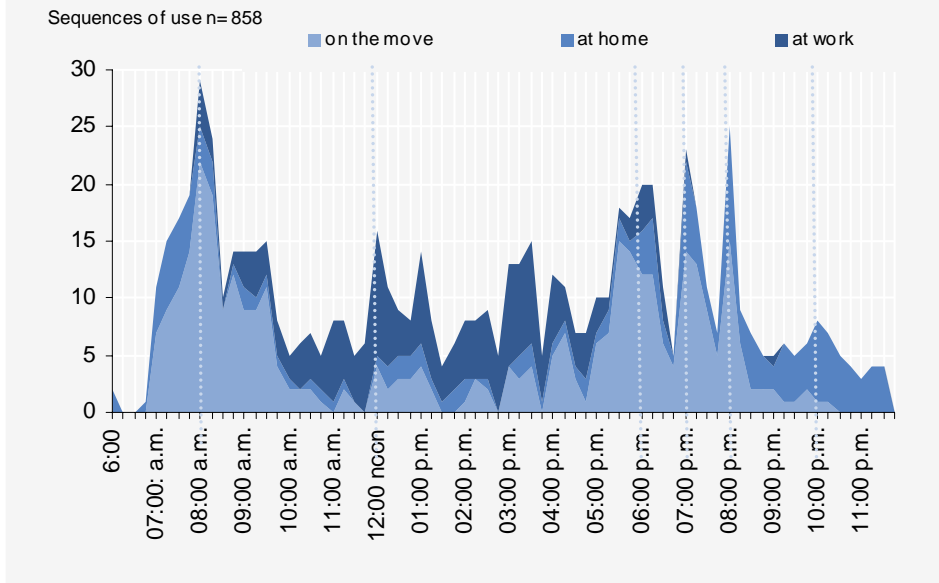
Chart 64: Mobile TV and Radio use during the day: Situations
(71 participants, 858 sequences)



The major blocks of use during the morning hours mostly covered the way to work. A first small block of use at home comes up between 7 and 8 a.m. (darker graph), then slowly after 8 a.m. use during work starts (brighter graph), keeps rising during the morning and reaches the main use level between 11 a.m. and 4 p.m. – including a major peak at 12 noon and smaller ones at 1 p.m. and 3 p.m.. During the late afternoon again the focus is on situations on the move. The third peak of the day occurs between 5 and 8 p.m. During this period the main news programmes cause steep strikes. The news is typically watched on the move (dark blue area). Only after 8 p.m. use on the move finally ends. At 6 p.m. the at home use graph starts to rise. After 9 p.m. almost all mobile viewing is done at home.

Chart 65 shows the same data in a cumulative way. Here, the overall area depicts all sequences of use; the overall area's differently coloured subdivisions represent the respective percentage of the total use. The main using periods in the morning and late afternoon, i.e. early evening are dominated by situations on the move, i.e. travelling to and back from work/home (bright blue area). From morning until afternoon sequences of use during work/at university dominate (dark blue area), breaks are included. At noon the graph shows a small peak during the lunch-break. Watching at home (blue area) is reserved to the early morning and late evening, however, altogether at a much smaller rate than on the move or during work. Actually, it is less interesting to see which section of use corresponds to which location than how exact the participants' daily routine is depicted. We believe that this represents a typical pattern of mobile TV viewing already which is completely different to traditional TV watching which is an evening event especially for the working population because it is fixed to one location.

Chart 65: Mobile phone TV and radio use during the day by situations, accumulated/piled (n=71; 858 sequences)



Due to new transmission technologies TV viewing is no longer tied to a particular location¹⁸ but is becoming a companion for the day, and since we have carried our mobile phone with us for the past few years according to our thesis it is the ideal device for integration of TV.¹⁹

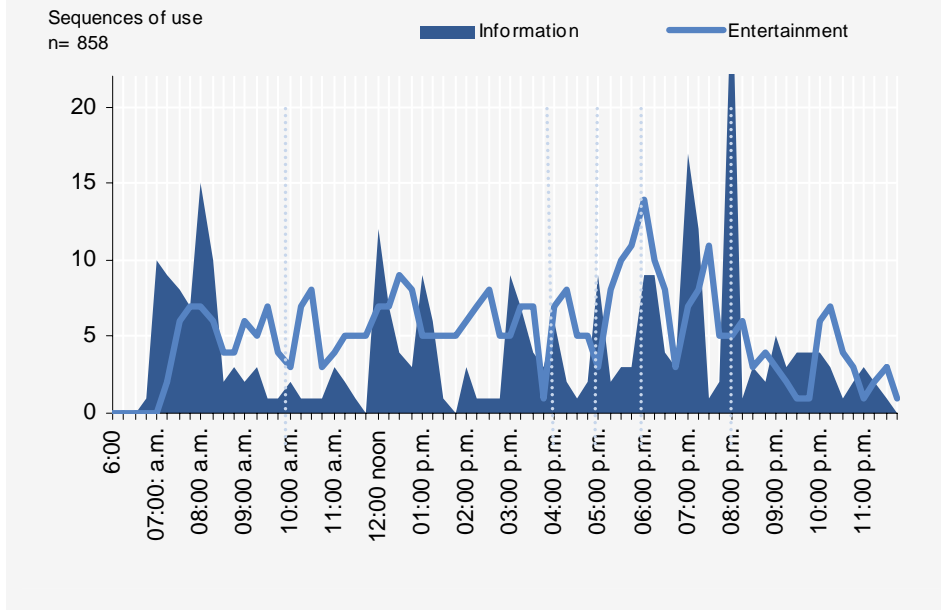
Patterns of Use during the Day: Information- and Entertainment Programmes:

Information- and entertainment programmes show rather different daily using patterns. While information programmes are marked by short using peak only, their focus being in the morning and in the evening, the use of entertainment programmes spreads rather equally all over the day. Let us take a look at both the information- and the entertainment graph. Chart 66 shows the attribution of the sequences of use to the information- and entertainment genres. First of all the different shape of the two graphs hits the eye. Information sequences (area graph) are mostly short and heavily bundled (peaks), they correspond to the way one uses current information to stay informed. The reception of entertainment programmes lasts longer und spreads over the course of the day (blue graph). Only in the early evening between 5 and 7 p.m. its strike gets stronger.

¹⁸ Mobile TV receivers have been offered on the market for quite some time without having initiated a new form of TV - reception.

¹⁹ Also see: Katz (2003), Ling (2004), Hanekop/Wittke (2006).

Chart 66: Mobile phone TV and radio use during the day: Information and Entertainment (71 participants, 858 sequences)



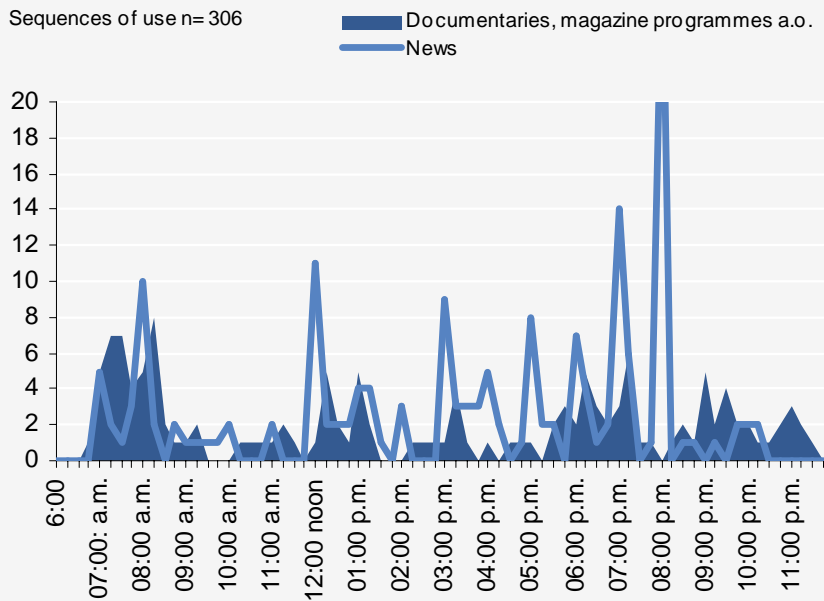
At first glance the large percentage of entertainment sequences is rather surprising (blue graph) but due to the way the graph is presented entertainment sequences are attributed more weight than in the analysis of the survey, because we base it on sequences of use and not on individuals. In the daily graph each sequence counts – no matter whether one individual used fifty sequences per day or only five. This means that individuals who used a large number of sequences are over-represented. Secondly, entertainment sequences normally last longer, i.e. a long sequence of use is recorded in several fifteen-minute-intervals. This presentation is useful for describing patterns of use during the day. However, it should not be overrated in regard to establishing the acceptance of certain programme offers by individuals.

In the following we shall look more closely at the internal distribution of information- and entertainment programmes. In chart 67 the information sequences are divided into news bulletins on the one hand and documentaries, reports, economic- and other magazine programmes on the other. Chart 68 then shows the internal spread of entertainment sequences on TV-music formats and fictional programmes, especially of the early evening series.

The spread of information reception (chart 67) shows that news really are dominant and that other information programmes are watched especially in the morning. In the evening there is an increase in current affairs programmes again. Especially after 9 p.m. they are watched more on the mobile phone (possibly because the stationary TV set is occupied by other persons).

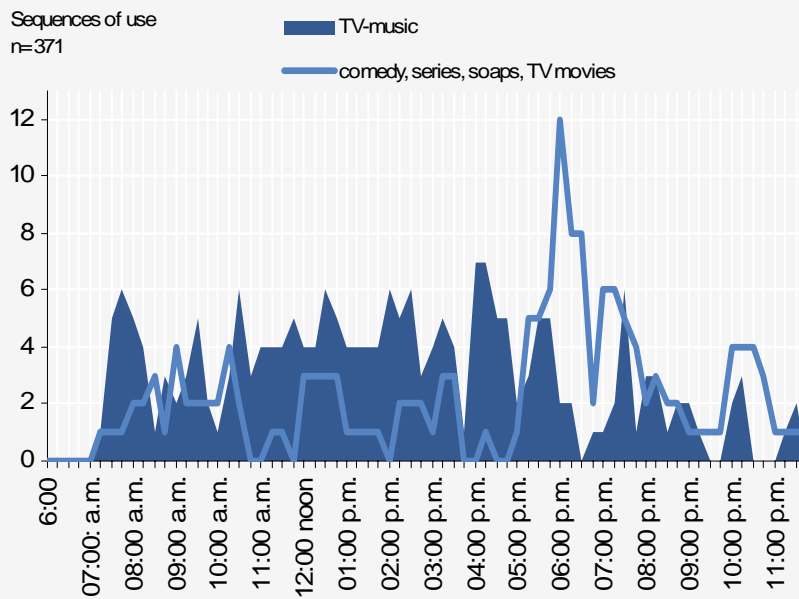
6. Regular Use of Mobile TV in the Second Test Phase

Chart 67: Mobile TV use during the day: Information programmes: News and other information programmes (71 participants, 306 sequences)



More than fifty percent of entertainment consists of TV-music consumption (chart 68), spread more or less equally over the day. The radio sequences are not included here; they are shown in a comparison with TV music programmes in chart 70.

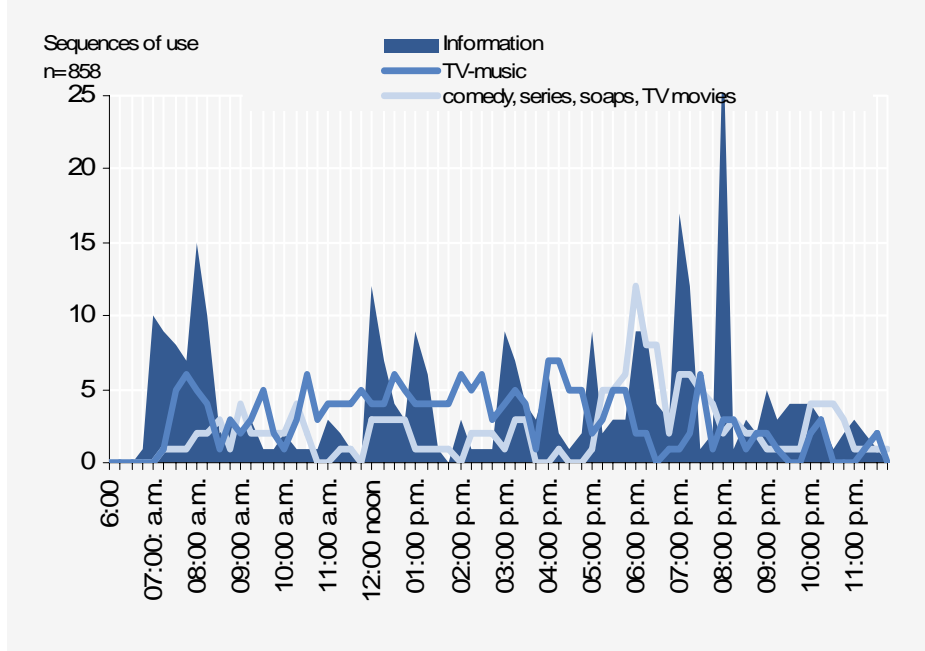
Chart 68: Mobile TV and radio use during the day – entertainment: Fiction and TV-music programmes (71 participants, 371 sequences)



Also the mobile phone is used to watch or listen to music (clips) on the side or for relaxation. The advantage is that one does not have to stop other activities. Fictional TV-programmes require more attention. They are not watched much during the day “at work” but rather after 5 p.m., mostly on the way home on the bus or the train. These formats of early evening series are suited particularly to mobile viewing; also, the broadcasting times fit well to the way home and the relaxation period after work.

In chart 69 the sequences of use are depicted again as a whole, divided into information, TV-music programmes, and fictional entertainment (TV movies, series, soaps, and comedy). This presentation illustrates the distribution of genres throughout the day: In the morning and in the evening at the major news times information programmes, together with their typical peaks, are dominating (blue area). During the course of the day music programmes are watched more often (dark graph), while in the early evening series come first (bright graph).

Chart 69: Mobile phone TV- and radio use during the day: information programmes, fictional entertainment, and TV-music programmes, accumulated/piled (71 participants, 858 sequences)



This spread of sequences of use into information, TV-music, and entertainment series throughout the day is revealing in many respects.

In summary:

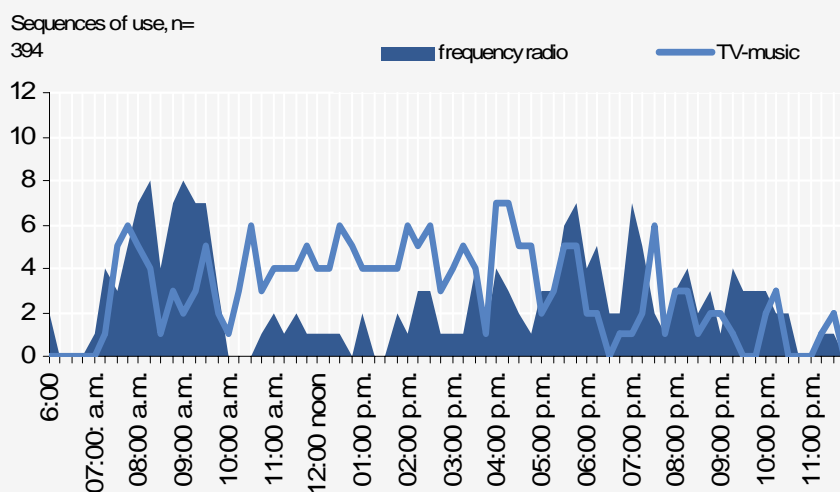
- TV viewing on the mobile phone includes all three genres but with different usage patterns and in different situations of the day.
- TV-music accompanies the recipients during work or in similar situations. Often it is entertainment on the side; one listens to music and occasionally glances at the screen; here and there MTV gets turned on shortly.
- Current event programmes require attention and other activities have to be stopped, but they don't take much time. This way of receiving information is

known from the radio and is socially accepted. The only thing that changes is the medium – one watches news during the day on a mobile phone.

- Fictional entertainment, especially series, can be attractive during the relaxation period after work. Maybe the commuting times might be better suited than short breaks. However, at this point we have to point out again that the entertainment offer in the test is limited. We can not say whether or not more series, comedy, or soaps would be watched if a wider range of programmes was offered.

Chart 70 shows the use of radio compared to the TV- use of music programmes. The participants listened less to the radio on the mobile phone than they watched TV music programmes. It seemed more appealing to be able to occasionally glance at the screen than to “only” listen to the radio. Some participants turned to the radio when the situation made it impossible to watch TV, like, for example, while riding a bike.

Chart 70: TV-music programmes and radio use during the day
(71 participants, 394 sequences)



The evaluation of the logs shows how mobile viewing was integrated in the scope of daily activities. The usage patterns directly reflected the recipients' routine: In the morning they looked for information, first at home but mostly while commuting. Afterwards they did some watching at work or at university, preferably during the lunch-break or the afternoon break. In the late afternoon and early evening they watched on the way home. TV on the mobile phone was TV for the day which accompanies the recipients to the places they have to go to during the week, eventually creating patterns of use in different everyday situations. These patterns might manifest into routines which will have fixed slots in the daily schedule, similar to TV in the evening. Mobile viewing fills gaps which other activities have left behind. However, people who live on a tight timetable will find less gaps which are suited for watching mobile TV.

Secondly they depict the course of the TV-programmes: Each main news broadcast produced a peak and even the early evening programme caused smaller strikes. This contradicts the thesis (which we had adopted as well) that

TV – reception on the mobile phone during the day is not oriented on the time structure of the TV – programme. The graphs suggest that to some extent the TV – programme does structure the daily routine – at least with certain user groups. Especially the news are predestined for this: They are limited in time, and their reception during the day is socially accepted. At least this applies to our target group. Other contents and/or time structures might have the same effect on other social groups (for example, with juveniles).

The daily patterns provide indications of how the test participants integrated mobile TV – viewing in their daily routine. However, at the same time they show the extent reception by mobile phone and contents during the day differ from the way people watch TV in the evening at home.

7. Use of DMB- and DAB Radio Offers on the Mobile Phone

98% of all German households own a radio which is used on average three-and-a-half hours a day.²⁰ Respectively, 63% of the test participants' living rooms feature a radio, also 48% of the kitchens and 43% of the bedrooms. 71% of the participants listen to the radio every day, 14% several times a week, 13% rarely, and only 2% claimed that they do not use the radio at all. Only 15% had advanced to the digital age of radio listening, they listened to Digital Audio Broadcast (DAB) often (5%) or at least occasionally (10%); 69% did not use the DAB - offer, another 16% did not know DAB at all. More than half of the participants (57%) had a favourite station which they preferred normally all others listened to different stations.

The mobile use of the radio is not as much of an innovation as TV – viewing on the mobile phone since as early as from the mid-fifties people have received radio programmes on the move via transistor radios. On top of this, in 2005 almost 84% of all households had a car radio,²¹ and an increasing number of mobile devices like mobile phones or MP3-players have (VHF-) radio as an add-on - feature. One third of the people interviewed claimed that even before the test they “almost always” (24%) or at least “occasionally” (10%) carried a radio with them; 62% regularly had an MP3-player or an iPod with them when they were away from home. A quarter of the people interviewed (24%) owned a mobile phone without radio but would have liked this feature; 16% did have a mobile phone with an integrated radio but did not use the radio feature. Of the people owning the radio add-on on, 7% use it „regularly“, and 18% do “occasionally” only. Thus, to many participants the novelty was not the chance to listen to the radio while travelling but the integration of the radio in the mobile phone which 98% carry with them “every day” or “almost always”. On top of it there is the DAB- and DMB-specific radio programme offer which can be received by the test devices.

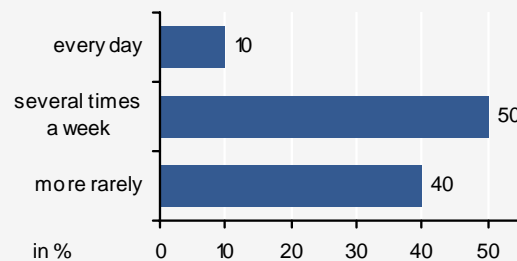
²⁰ Vgl.: Reitze (2005), S. 68.

²¹ Vgl.: Reitze (2005), S. 63.

Frequency of Use of the Mobile Phone's Radio

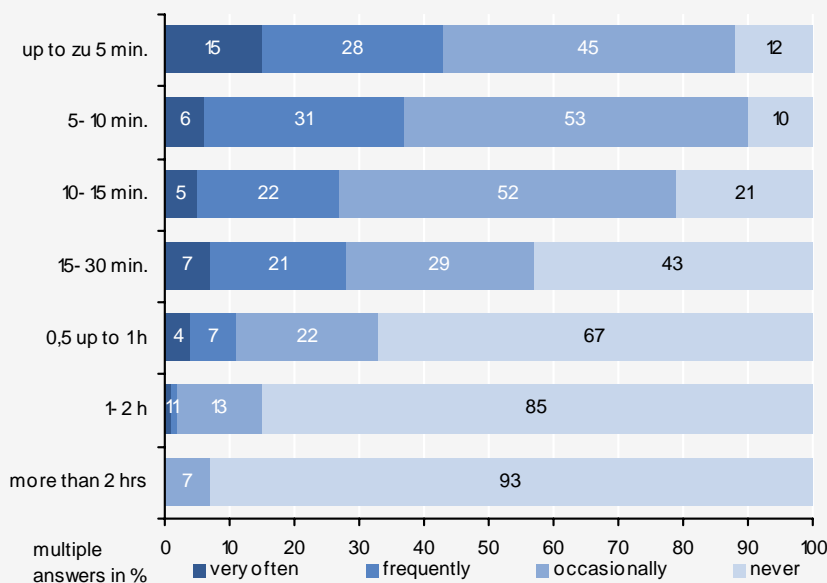
18 different DAB-programmes could be received during the test. 71% of the test participants had tried out the radio after during the six weeks of the test. Half of the participants turned their mobile phone's radio on "several times a week", another 10% as much as "every day", the other 40% "less often" (chart 71).

Chart 71: „How often do you listen to the radio on your mobile phone?“ (n=108)



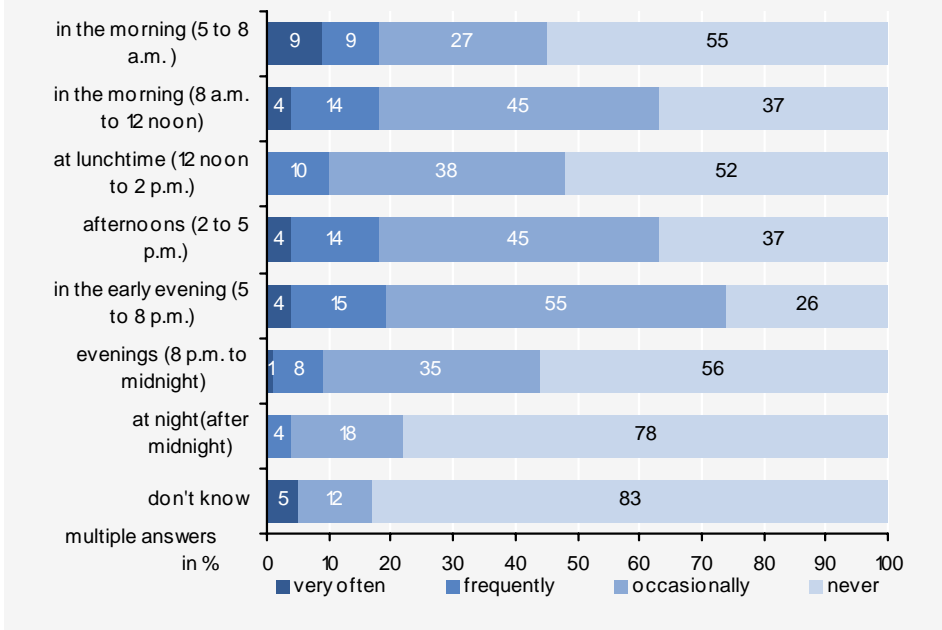
Mostly the using sequence (chart 72) lasted up to 30 minutes, listening to the mobile phone radio for up to two hours was exceptional.

Chart 72: “When recalling the individual situations, how long is one sequence you listen to the mobile phone's radio for?“ (n=108)



Use during the day (chart 73) was spread quite evenly between 5 a.m. and 8 p.m. including an unexpected minor decline during the lunch-break between 12 noon and 2 p.m. After 8 p.m. and during the night the mobile phone's radio was hardly used. The four broadcasting stations used most were Rockantenne, Gong Mobil DAB, BR B5aktuell, and Radio Galaxy. The test participants of our sample would have liked Radio NRJ (Energy 93,3), Antenne Bayern, and Bayern 3, known to them from VHF transmission, for an additional choice of stations.

Chart 73: "At which times of the day do you listen to the radio on your mobile phone?" (n=113)

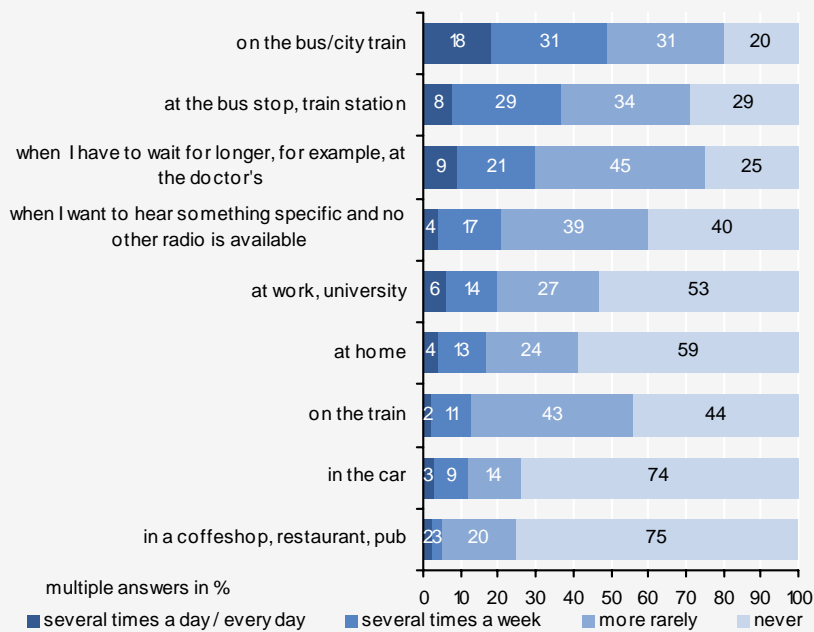


The data on length of use and frequency of use collected for the test sample show that the use of radio on the mobile phone was different to the traditional way of using the radio, and that at the time of the test mobile phone radio did not yet succeed in substituting the traditional use. There are different approaches of explaining this. A large number of radio devices are available already at home, on the way to work, and even at work. Traditional radio sets are built to provide good quality sound, and due to years of being used to them fixed using habits have established – which is not yet the case with the mobile phone’s radio feature. On top of it, TV and radio having merged in one mobile device always creates a situation which is competitive to the use of the respective other medium, and for the most part TV viewing outrivalled the radio. During a discussion one test participant explained it like this: “Why should I listen to the radio if on TV I get a picture with it?” Nevertheless there are several situations which favour the use of the mobile phone’s radio.

Situations of Radio Use

The mobile phone’s radio feature was used predominantly during bus or train rides or while waiting at the bus stop or the train station, also, in other situations where one had to wait, for example, at the doctor’s (chart 74). Also, the mobile phone’s radio was listened to while being at work, at university, at home and during train and car rides. Contrary to this usage was of little importance during visits to the coffee shop, the pub, or the restaurant.

Chart 74: „What are the situations during which you listen to the radio on your mobile phone?“ (n=118)

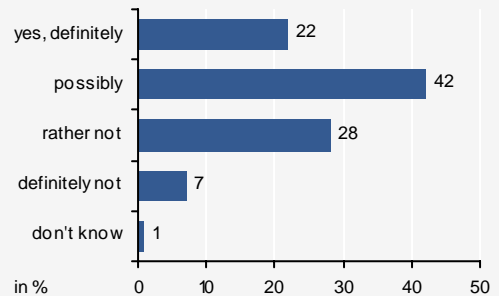


Open answers regarding additional usage situations were “at the lake“, “while riding my bike“, or “while I am jogging“. In all these situations half of the test persons most of the time (28%) or always (26%) wore headphones.

When being asked if in future they would use their mobile phone to listen to the radio, about two thirds (64%) of the participants answered “yes, definitely“ or “possibly“, the other third (35%) did “rather not“ or “definitely not“ want to in future use the radio feature.

The last look we take is on the rating of “bigFM2see“ and “Das Modul“, radio programmes which are enhanced by graphic animation. Only about 15% of the users questioned rated the two programmes “excellent“ or “good“, but in each case more than half (54%, i.e. 52%), did not seem to be sure about them and answered “I don't know“. One reason for this could be that according to the participants 48%, i.e. 37% could not receive the programmes, or the transmission was very bad. Another reason could be that in the device's menu they were listed as “TV“. Animations or fixed images are different to what is expected of a “TV“ option.

Chart 75: „Do you intend to listen to the radio on your mobile phone in future?“ (n=182)

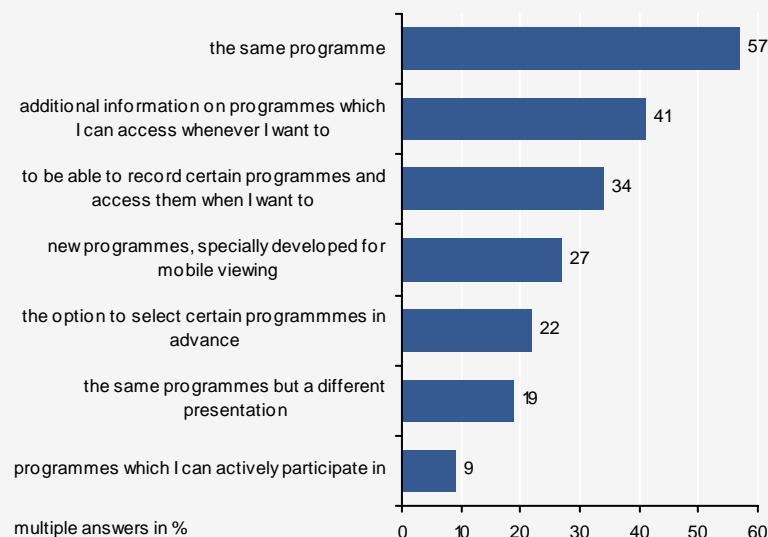


8. Which Contents do the Participants Want? Theories on Programme Offers

The majority of test participants would like to receive the normal TV programme on the mobile phone. This is what 81% of the participants said before the test (com. chart 17), at the end of the test 57% still agreed to this claim. By this our findings reflect a trend which is established in other studies, too,²² the last time in a representative study conducted in spring 2006 by Kaumanns/Siegenheim.²³ He seems to confirm the theory that the new broadcasting services will be no more than a distribution channel for the established TV-programmes. In the following we would like to take a close look at this issue.

As mentioned before the results of the survey confirm that the majority of the participants expected the traditional programme to be offered as a basic offer. When looking more closely at the findings we can see that their expectations were not met yet by the basic offer which was presented. Previous to the test, on top of the known TV programmes 44% expected new programmes, developed especially for use on the mobile phone (comp. chart 17). At the end of the test – i.e. after about eight weeks of daily use - 41% of the participants wanted additional information on call. 34% wanted to record programmes to be able to watch them at some other time, 27% of the participants opted for new, mobile phone-specific programmes.

Chart 76: „Which contents would you like in future? “ (n=176)



Later on we will discuss these additional services for the mobile phone in detail. Right now we would like to examine the experiences the participants had with

²² Comp. Brodersen (2006).

²³ Comp. Kaumanns/Siegenheim (2006), p. 505.

the tested programme offer. Also, we want to collect ideas for improvement of the programme offer by looking at the development of the participants' reception habits. However, it is our theory that on a whole the participants' experiences with the programmes tested are *contradictory*.

On the one hand recipients of broadcasts on the mobile device expect the key components of the established TV-programme, i.e. most of all to receive the major TV-stations, because what makes mobile viewing appealing is not being tied to the location of the TV-set but to have TV available everywhere and at any time. The advantage of the diffusion of mobile viewing is the offer of sufficient attractive contents. Now innovative technology broadens the range of reception of the mass medium TV. When looking at the issue from this point of view the TV-programmes which are used the most, i.e. the established TV-brands, are the focus of the interest. However, this variety of contents is used in a most selective way – as the findings of this study told us. The participants employ mobile TV mostly as an up-to-date information medium.

At the same time experience with the usage of mobile TV shows that despite of its surprisingly good quality watching on the small display is not as popular as watching on the set at home. Although the quality of the small *display* was perceived as being surprisingly good, major limitations were detected as well. Related to the traditional TV-programme it appears like a filter for many TV-formats. For example, it is difficult to concentrate on complex content formats for a longer period of time. The more complex the story the more tiresome it is to watch it on the small display. Even during the World Cup watching TV on the mobile phone was described as an “emergency” option if one did not want to miss a match or in order to stay updated on the results. After the World Cup it was used as a “stopgap” for situations during the day where one had to wait, was bored, or simply wanted to be entertained. This means that mobile TV becomes attractive when no stationary alternative is available. This is mostly the case during the daytime and/or on the move.

For this reason the conditions and the habits of using mobile TV are completely different to those which apply to the traditional use of TV at home. As we have seen above, *short sequences of use* are typical of mobile viewing, the clock pulse is shorter and the time patterns are more complicated. They hardly depend on the TV-programme but rather on opportunities, and because of this it happened frequently that one tuned into running programmes for comparatively short time sequences. Often the moment the TV was switched on depended on the situation rather than on the time a certain programme was scheduled. Also, contrary to the typical use of stationary TV in the evening the participants, especially those who belonged to the fully employed target groups, watched mobile TV during the day.

Because of these special characteristics the interrelations between traditional TV-programmes and mobile usage are anything but optimal. The viewers found out that they could not watch TV on the mobile phone the same way they do on the traditional TV – set. Processes of adjustment and adoption started, the present stage of which may well be compared to first attempts at walking.

Positive experiences were recorded, too, where the “normal” TV-offer – despite of the different conditions of reception – fit to the new requirements of mobile TV-reception. From our point of view this applied to programmes and genres

which were used more often²⁴, like, for example, programmes on current affairs and music programmes. But surely it will be as possible as it will be helpful to make some improvements here, too, but the interrelations are not bad enough for mobile reception to be experienced as being unacceptable.

And of course there were negative experiences where the programme design and the formats did not fit to the situations of mobile use or to the reception on the small end device. According to our theory such experiences generate new expectations and demands in regard to programme offers and content design. Although the traditional TV-programme forms the basis of these extended requirements for mobile viewing, these new reception experiences will lead to new requirements and wishes for different, additional offers and services (see above). In the following we would like to present theories of the programme offers' further development based on the special conditions of mobile TV-using.

Special Conditions of Mobile TV Use

The participants' expectations were governed by the assumption that the normal TV-offer could be received on the mobile phone everywhere and at any time. However, due to their using experiences they started to realize that not all TV-programmes and formats were suited to viewing on the mobile phone.

1. On the mobile phone the traditional TV- programme was used in a *selective* manner. Usage focused on information programmes. The participants concentrated on the latest news, sports, and current affairs (see. chart 47). Music channels and programmes dominated on the entertainment sector, series or similar formats were watched too. The traditional TV-entertainment genres were watched far more rarely on the mobile phone, and if any, it was mostly series. At the same time it should be considered that the results were limited by the absence of the established private entertainment broadcasters.

When examining the reasons for the selective usage of the TV-offer it turns out that for one these preferences were based on interest in the respective contents which were different *during the course of a workday* than they were at home after work. Most of all they targeted short current information – such as classic news, sports, weather forecasts, magazines, or reports on current affairs, and secondly musical entertainment on the side which required less attention and fit into the daily routine. It is no coincidence that to a large extent the TV-genres used by mobile reception are similar to the classic radio genres. The daily mobile TV-reception and the radio format reception graphs showed interesting parallels (music, interrupted by short news broadcasts). This raises the question of what can be learned from the radio programmes for the design of mobile TV-programmes.

On the other hand, the selective use of the programme offer also shows which ones of the existing *broadcasting formats* are suitable for mobile usage and which ones are rather unfit to be consumed on the mobile phone. After all, the classic broadcasting formats more or less meet the requirements of mobile usage:

²⁴ We assume that the participants selected by us who were most interested, curious, and technology-loving did try all the offers at some time and not that certain offers were not used only because they were not known.

News formats also fit the short sequences of use in mobile using situations. This applies to the classic news formats, an advantage for the public service stations. News formats are well suited for mobile TV, they are limited in time, their structure is known, and their public reception is socially accepted. N24 completes this offer by presenting news and reports independent from the fixed time schedule of the broadcasting stations which are not specialized. This format meets the requirements of mobile usage in a special way because it grants its users more flexibility in regard to time. The recipients do not have to wait for the next news broadcast on the full hour but can tune into news bulletins and reports whenever they have time.

MTV was found attractive because this station linked to radio- and music listening as most important medium “on the move” and at the same time took over an important format. The combination of audio- and visual use received a most positive rating. Some users regarded the combination of mobile phone with added TV feature as a substitute for the MP3-layer (*“MP3-player replacement which does not need to get updated”*). To some MTV on the mobile phone was particularly attractive because “MTVshorts” is a format for mobile use which consists of clips only, shows and commercials are left out: *“MTV, finally back to showing clips like it used to. At first I didn't like it because it did not show the same as on TV, but now it is exactly this what I think is good about it. No annoying ringing sound commercials, in fact, no commercials at all. “MTV's programme format fits well into situations of mobile use. One female participant expressed it like this: „I think that MTV suits mobile phone TV well because often the duration of the content is short, for example, usually a music video lasts three to four minutes only. I can rarely watch a one-hour-programme to the end while I am on the move!“ „MTV is entertaining, also during short periods of waiting“.*

Contrary to this, formats which transmit their message predominantly in a visual way are particularly difficult. Formats which put important statements across (also) verbally *and/or by text* are less complicated, easier to follow, and less wearisome. This applies to broadcasting football matches, but also to the news and many other information programmes, as well as to some programmes of the entertainment genre, such as most comedies, but also many series and soaps. But in the entertainment genre, contrary to the information genres where the requirements are fulfilled by the format already, for each individual programme the suitability and quality of viewing on the small display have to be examined.

The participants' selection by content out of the available programme offer shows – and this is our thesis – which contents and formats are of interest on mobile reception conditions, *and* allow for an acceptable quality of mobile reception, i.e. which programme formats and which designs comply with these conditions. From our point of view this is a positive selection of a mobile programme offers, not being complete but good enough to start with. On top of it it was put together by a special sample.

However, it is not meant to exclude new offers. To the contrary – we feel that the strongly declining interest during the second test phase is an argument for new content offers. Changed programme formats and designs might be especially important to genres which so far were not watched much on the

mobile phone, like shows, for example. Maybe it will be possible to learn from the information programmes how to design them.

2. The daily temporal programme pattern comes into conflict with the everyday routine and the recipients' using situations.

The log studies have revealed positive examples where the participants succeeded in harmonizing both their interests and the programme offer. Examples for this are the magazine programmes in the morning, the news, and some of the early evening series which help to relax on the way back from work. With the help of the logs we were also able to establish the structuring of the daily rhythm by the TV-programme – like, for example, the combination of lunch-breaks or travelling times with news programmes. These findings support the assumption that also during the day time patterns of TV-reception are developing. However, additional studies should examine in detail at which times mobile TV - target groups want to watch which contents. But here, too, it is our theory that the daily logs systematically collect the positive cases which permit us to forecast what can be used for mobile viewing.

In many cases the temporal programme offer did not fit the daily routine and the interests of the participants too well. As a consequence they switched off quickly and on medium-term lost interest altogether. The results of the questionnaire and the focal group discussions prove that it was difficult for many participants to bring the opportunities to watch TV during the day in line with the time pattern of the TV-programme. Often a conflict developed which was hard to overcome between the fixed broadcasting times and the time gaps during which one wanted to use for watching TV.

There may be different reasons for this. First of all, at the times during the day when the participants wanted to watch TV the programme offer did not seem interesting. The test participants complained quite frequently about the programmes offered and their time windows during the day. The number of interesting programmes was rather limited. These findings are not really surprising because the traditional daytime programme is attuned to a different target group. Our participants' customary TV-usage concentrates on the evening, and the programmes which interest them are shown in the evening, too. According to our thesis this mismatch of (daytime) programme offers and the interests of potential mobile TV target groups is a systematic problem —, because those who watch mobile TV are not part of the target group the classic TV programme caters for.

Secondly, the time structure of the TV-programme and the time slots for TV-reception on the mobile phone were not well matched. The individual programmes were too long, they were shown at the wrong time; possibly some of the participants were interested in certain subjects only and did not want to follow the entire broadcast; they had missed out on something and wanted to catch up on it. There is a lot more that could be added to this list. This takes us to the third issue:

3. As we have seen, short sequences of usage are typical for mobile TV – viewing but they do not correspond to many broadcasting formats. It happened quite often that the participants switched on to a running programme for a

comparatively short period of time. They could watch small bits and pieces of some programmes only because they had switched on too late or had to switch off too early. If using is a matter of watching for short sequences in order to fill gaps of the daily schedule this leads to a series of consequences in regard to the forms of mobile reception. Programmes are attractive to mobile TV viewers only if they offer useful contents also when watched for a short period in-between. However, judged by the findings of the study, this issue should not be decided upon prematurely on the basis on one's own prejudice because especially in mobile TV there seems to be an extremely large variety of individual assessments.

It was much easier to match formats and short sequences of use if these formats were short, too. As we have seen, news and music clips were a positive example for this. More or less the same applied to many comedy formats, too. Surely this situation provides plenty of room for experimenting and for the further development of formats.

However, the findings of the study do not simply that only short clocked formats are attractive for mobile TV-reception. Short sequences of use do not imply that the programmes' time structure should adapt to these short periods of use. The argument against short clocked broadcasting formats is that often the message will suffer. And in this respect the participants often were comparatively discerning. Short intervals mean short messages and little background information – and especially the latter was important to many participants.

Nevertheless, if one is willing to deal with this mismatch it is important - according to our thesis – to consider this conflict when creating the contents in order to enable the recipient to profit of the content of the broadcast despite of the short sequences of use. In this context two points are important:

Firstly, it should be possible that the viewer comprehends as quickly as possible what the programme is about. Quite frequently the participants did not watch complete programmes but looked into them shortly to get an idea of what was happening. Or they started to watch something on the way home and continued at home on their normal TV-set. Even some short “zapping” into running programmes seemed to be interesting while being on the move. Programme formats and principles of design which consider the above will be able to boost the acceptance and extension of mobile viewing. When viewers tune into a running programme it is important that they find out relatively quickly what it is about.

Secondly it is important whether or not programme tells a complete story or of the reception of a short part of it makes sense. It is easier to comprehend a story which has already started if one knows enough beforehand about the subject, the characters, or the dramaturgy. This is the case with the news, sports events, and series. The more familiar the subject the more value a clip offers. Useful tools for designing are recognizable points of entry, factors of recognition, or information during the course of the broadcast. In the case of football matches the score represents such a point of orientation. As far as other genres are concerned it might be worth thinking about how a similar effect could be produced. For example, some of the participants recommended optional text flashes or some kind of TV-text. One consideration would be a reasonable size of the letters appearing on the mobile phone's display.

Mobile phone TV viewing “on the side” seems to have an appeal of its own but bears some problems. Without doubt the typical on the side-genre is music. However, watching “on the side” on the mobile phone calls for certain specifications, such as the orientation towards audio-based formats. Several requirements in connection with use on the side pertain to the design of the end device – in this respect the mobile phone used for the test showed considerable weaknesses. It turned out to be difficult to control the mobile test phone when watching “on the side”. On top of this it was not possible to place the mobile phone in such a way that watching TV was possible without having to hold it. When walking around it was difficult to carry the mobile phone in such a way that the pulled out antenna did not get in the way. Because of the antenna attached it was not possible to put the mobile phone in a (shirt) pocket while it was on reception.

It is essential that the time it takes to activate the device and to change programmes is short. Our findings prove that DMB – technology offers the necessary user comfort - switching on by pushing a button is quick, and the reaction period when changing channels is reasonable too. Nevertheless some participants criticized the reaction period as being too long compared to the time it takes on normal television – which is understandable from their point of view. To the users every second gained when changing channels would be an improvement.

Since in total the time slots of daily mobile viewing were very short – hardly more than 15 minutes – the participants were definitely did not want to spend much time on looking for interesting contents. Due to these findings a clearly laid out programme guide and easy selection by pushing buttons instead of endless procedures are commendable. As we said in the beginning, this is also a major advantage of the broadcasting technology used for the project.

New Offers, Services, and Features for Mobile Viewing

As we stated already in the beginning (chart 76), the majority of participants would have liked the classic TV programme but also a selection of different supplementary and extension features. The appeal of the most important features was based on the conflict between the broadcasting times of the programmes which interested them and the situations they could be used in. During the course of the day the time slots for watching TV were short and hardly ever corresponded to the broadcasting times. The above mentioned interest in programme saving options which permit delayed viewing (mobile video recorder) derived out of this experience. However, top of the desired additions was the requirement of additional “on demand” information on the programmes. Also during the focus group discussions this request was the one which was made the most frequently, modelled on the classic video-text which would have to be re-designed for the mobile phone.

In line with this some participants asked for an electronic programme guide (EPG). Especially the experts amongst the participants suggested this feature. The members of the focus group discussions rated the EPG as an option which was worth considering. However, it is debatable whether or not the EPG would be used often to look for specific contents. Participants who previously selected their programmes by rundown mostly welcomed the EPG suggestion.

Typical “zappers” would not use it on the mobile phone either. Even more often than the EPG the participants requested a mobile video recorder as an add-on feature, as well as additional information. Of course, both of it could be integrated in an EPG.

In the end there was only a relatively small group left asking for programmes especially designed for mobile viewing and for interactive broadcasting formats. The focus groups discussed this subject controversially. Here, too, the supporters were outnumbered.

Still we know that the expectations in regard to the future use of mobile services may differ considerably from the actual experience and rating. When analyzing the results it should be taken into consideration that the respective sample was technology-affine and that many participants of the group discussions knew about the controversies on the subject of new interactive services. Most likely a less technology-oriented sample would produce less requests of this kind. On the other hand one of our main arguments is that prognostic statements by potential users on appliances they don't know and have not tried out themselves should not be overrated. This issue leaves many questions open and should be examined in additional studies.

In summary we are able to establish that the test has produced many starting points for improving the programme offer and to develop suitable formats. It has become clear that further improvement of the programme offer and the development of formats which suit the mobile phone are important if one wants to stabilize and boost the interest in the mobile phone TV feature which in principle already exists.

- Suggestions on the further development of the mobile TV programme offer
- On workdays information programmes on current affairs form the focus of interest during the day – especially in the morning. They are attractive content offers which could be extended (local news, main news in the morning, frequent reruns...)
- Entertainment programmes may be extended to suit the target groups, as the case may be; often the formats do not fit too well to the forms of mobile reception, new formats or supplements (for example, additional information, orientation options) should be developed
- The design of contents for mobile viewing should be adjusted to the special conditions of mobile use which include short sequences of use, use of time gaps in the daily routine for watching TV, and limited flexibility in regard to time
- Short broadcasting formats match short sequences of use, but the participants warned of their disadvantages (inferior quality of the content). This means that adjusted formats do not necessarily have to be short, i.e. „short-clocked“.
- It is important that the viewers are able to tune into a running programme and comprehend quickly what it is about. Assistance with orientation and structured broadcasting formats may be helpful here. Useful are:
 - Orientation tools, texts, and banners get positive ratings but the writing must suit to the mobile phone

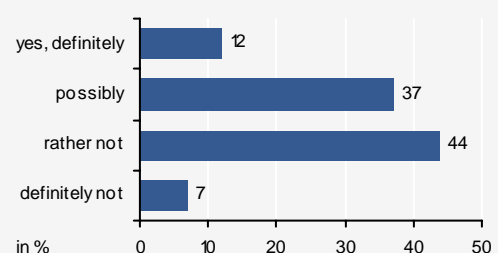
- A familiar broadcasting structure is helpful for getting into the theme of the programme, also, if the background story is known, recognition effects could be used and reruns be offered
- Verbal support of visual forms of presentation would be useful; programme formats could be adjusted by complementing them verbally and/or with the help of text information
- Mobile TV-offers tap new target groups for the daytime programme. If new target groups are aimed for attention should be paid to their interests and requirements in regard to contents
- Since for mobile TV reception the time structure of the daytime TV-programme is decisive this structure should be attuned better to the daily routine of the mobile recipient groups
- The participants want additional information on call (comparable to videotext) which are suitable for mobile end devices
- Saving features on the own end device would permit delayed reception and consequently would be a decisive contribution to solving the conflict between broadcasting times and the recipients' limited leeway in regard to time during the day
- An EPG would make the selection easier, here it would be interesting to integrate additional information and an automatic pre-selection

9. Requests for Improvements

In the previous chapters we outlined the test participants' experiences with the TV. And radio offers during the eight weeks of the test. We have analysed the possible reasons for use and acceptance of the new TV- and radio services on mobile phones and which patterns develop during regular use. During the course of the test we have seen that the use of mobile TV is heavily influenced by external factors, especially by media events and even by the nice weather one would like to enjoy outdoors. These factors can hardly be influenced by any providers but they should be known in order to be able to develop an attractive offer. In the following we would like to examine those factors the providers can influence or determine directly. We are going to examine from the test participants' perspective as potential customers which ones of these factors are important in regard to the intention to utilize, i.e. to buy.

At the end of the test about half of the participants were inclined towards future use of TV on the mobile phone as chargeable service (chart 77). Of these, one smaller group (12%) had already decided to definitely use it, most of the participants thought they might use the TV feature on the mobile phone (37%). The other half would "rather not" buy the service (44%), and only 7% knew already that they will "definitely not" use the service. In order to find out on which conditions the would make a more positive decision we asked: "Which improvements would make you want to use the mobile

Chart 77: Intention of use at the end of the test (n=178)



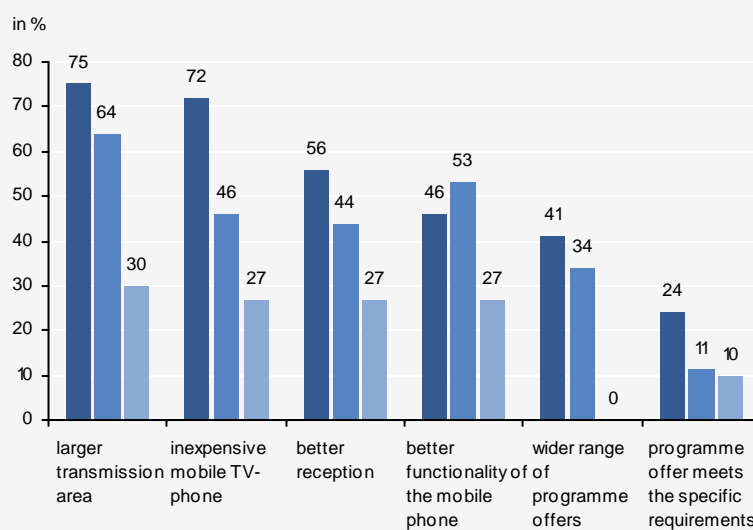
phone's TV feature in future?" From the test participants' point of view the following factors should be improved:

1. larger transmission area
2. inexpensive mobile TV-phone
3. better reception
4. better functionality of the mobile phone
5. wider range of programme offers
6. programme offer meets the specific requirements of the mobile phone

In this context certainly the price of the service and the price of the device are important, too, this is why we asked the participants about both.

Chart 78 shows how much each individual factor would influence the participants' decision to be positive.

Chart 78: "Which improvements would be an incentive to you to use mobile TV in future?" (n=157)



Three pillars are depicted for each request for improvement: The first pillar (dark blue) represents the participants who "might want" to use mobile TV, the second (blue) pillar those who "rather not" want to use it, and the third (bright blue) pillar those who "definitely don't" want to use it.²⁵ The sampled improvements have the most effect on those who had claimed already that they "might want" to use the service (dark blue). On the other hand it proved to be hard to make those who did "definitely not" want to use the service (bright blue) to change their minds. The blue pillars all stayed below 30%, i.e. the other way round about 70% did not change their minds on anything, but in any case this group consists of 12 participants only. For this reason the two large groups of the undecided are the most interesting (dark blue and blue)

²⁵ The question to those who definitely did not want to use the mobile phone's TV feature was: „What could it be that should be improved so that you would decide to use it after all ?“

A larger transmission area would be the reason for 75%, i.e. 64% to take a positive decision. Therefore, looking at it from the provider's point of view coverage improvements would have the greatest effect but of course they require major investments. From the test participants' point of view the size of the broadcasting area, together with reliable reception within the broadcasting area is a key factor because experienced proved that in cases of doubt reception was not available every time when they wanted to use it (see below). The "possible users" claimed that the second most important factor was an inexpensive mobile TV - phone (72%). The "rather not users" considered functionality as the second most important factor (53%). The latter tended to refuse to accept the service because they had learnt from experience that for mobile TV viewing you will be forced to accept a mobile which does not meet one's own requirements— we will discuss this in detail below. To a part of the test participants this limitations weighs heavier than the price of the mobile phone itself. Improvements may be expected when more mobile DMB phones are available. Consequently the fixation of some of the mobile phone manufacturer proves to be a handicap in regard to diffusion.

According to these findings improvements of the programme offers only have a minor effect on the decisions. A wider programme range would be a buying incentive to 40% of the undecided only. At this moment mobile phone-specific programme offers are not really important (yet) for any decisions. Since our test sample is not representative for the whole of the population this list of priorities can not be generalized but it is cross-confirmed by different (quantitative and qualitative) examination methods and we presume that at least for the target group of early adopters which was represented in our sample it will stay significant for more than twenty years. In the following we would like to describe in detail the factors mentioned from a user perspective in order to work out on the basis of the test experiences why they are important from the participants' point of view and what could be improved.

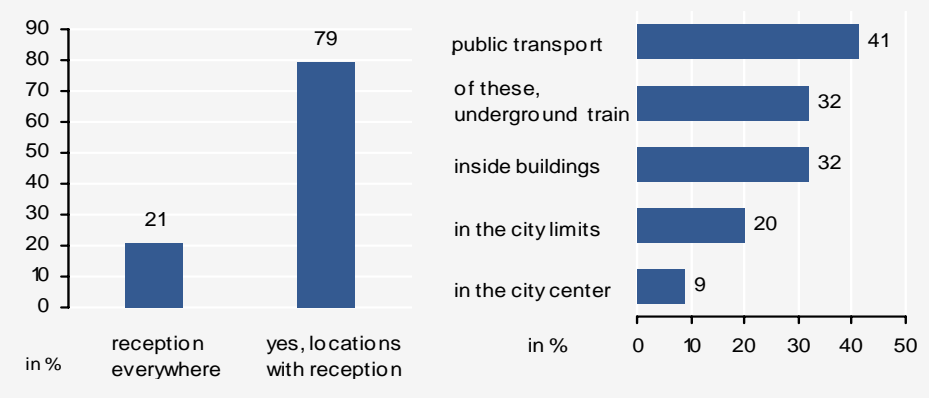
Transmission Area and Reception

According to these findings, without any doubt the size of transmission area and the reliability of reception, - i.e. the technical availability of the service - have the biggest influence on the buying intention of potential customers. To 75% of the undecided participants and to 64% of the rather sceptical participants these aspects would be an incentive to use the chargeable TV – service. The importance placed on the transmission area, i.e. of the technical availability derives of the participants' experience that often they could not use mobile TV just at times they would have really liked to. In many cases spontaneously this lead to anger, on medium-term to disappointment, non-usage, and declining using intention. One participant put it like this: *"The problem is: the reception, the transmission area. I was hoping to be able to use the mobile phone on business travels, i.e. while sitting on the train, when being bored, that is when I would like to watch TV. And exactly this did not work. Eventually this kills the interest to such an extent that you say to yourself, this does not make sense."* Almost 80% of the participants had this experience. Surely the most annoying factor was the insufficient availability when travelling or commuting. Because of the conditions of the test mobile viewing was not possible during longer train- and car rides as well as during vacation trips, but

these situations were on top of the list of expectations in regard to mobile viewing. During the discussions it was mentioned frequently that train rides were considered as an ideal opportunity for watching TV on the mobile phone – if the transmission area was extended, this option would be available. One test participant said: *"I think it would be different if one was on the move a lot, sitting on the train, and the broadcast would be Germany-wide. This is when one has time and is bored, and I would definitely use it then."*

During the test the participants were asked for locations where they would have liked to watch but *there was either no reception or it was otherwise poor*. Here, situations of using regional public transport (ÖPNV) are top of the list (chart 79).

Chart 79: "Are there any locations where you would like to watch TV but there is either no reception or it is otherwise poor?" (n=177)



41% of the participants claimed that there they would have watched TV on the mobile phone but most of the time they were not able to. As many as 32% of the participants complained that they had no reception while riding on the underground train. One participant: *"It is a nuisance to be in the underground for half an hour and not to receive a signal. You are riding for half an hour and you can't take advantage of it."* Like this the most important situation for the usage of the mobile phone's TV feature was inapplicable. Apart from the reception in the suburbs, occasionally the reception in buildings in the city centre was criticized: *"I was in a situation several times where I had to wait for a long time, even as long as one hour, and I had no chance to receive something on these premises."*

In summary one can establish that technical specifications, transmission areas, and stability of reception are the most relevant factors to enhance the intention of future use. Because these characteristics touch the key motive to be able to watch TV on the move and in locations one would like. Of course the preferred condition would be reception everywhere. As long as this can not be achieved it would be recommendable to at least equip prime locations, first of all public transport and the respective stops and stations. Of course, the supply to railway lines, parks, and leisure areas would be interesting too.

Functionality and Price of the Mobile TV-Phone

The major relevance of the TV-compatible mobile phone's functionality is substantiated by several other results and by qualitative findings (open answers in the questionnaire, focus group discussions).

Towards the end of the test about half of the participants did not consider the TV-compatible device as their main mobile phone, i.e. they did no longer use it for phone calls, writing messages, and so on. In many participants' opinion the mobile TV-phone's features which were not TV-related were not up to standard or at least took some getting used to (chart 80). Although especially those participants

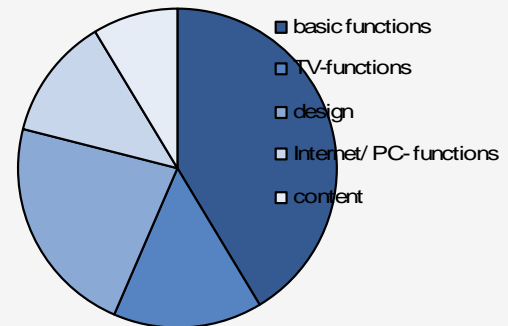
who were technology-affine were interested in the TV-service the other key functions were important to them also. Once they were dissatisfied with the other features if in doubt they rather made do without the TV - feature.

This is the flip side of the coin in regard to the introduction of the universal mobile device: The optimization of the mobile phone's TV - feature will possibly take place at the expense of other functions, or – like in this case - it will limit the usual choice of end devices.

On the other hand our results support this introductory strategy because even by our interested test participants and even during the World Cup the TV-function is perceived as an add-on-feature. As Kaumann/Siegenheim²⁶ establish in their study the question whether or not mobile TV makes sense is a key problem, at least during the initial phase of its market launch.

On top of it mobile phone users are brand loyal. Normally the menu logic of other manufacturers' devices is different and the change involves considerable effort. It is especially annoying if habits and routines have to be changed. Each change to a new mobile phone means new effort to the user. The more intense the use the more effort is involved. Because of this many participants transferred only some of their personal data to the mobile phone they were given for the duration of the test. Then, towards the end of the test, the participants completely lacked the motivation to set up the mobile TV phone for normal use, the result of this was that during the end phase a good half of the participants went back to using their own mobile phone. Without doubt the test as such caused this effect. However, as long as TV on the mobile phone is regarded as an add-on-feature there are many reasons why the limited choice of DMB-compatible mobile phones will at least slow down the spread of the service because potential customers will be forced to select a certain device by a certain brand. Our findings support the theory that many who are interested in mobile TV, especially the technology-affine ones, will rather make do without the TV – service than to change to a brand which forces them to adapt in a big way.

Chart 80: Criticism regarding the functionality of the mobile TV-phone (n=178)

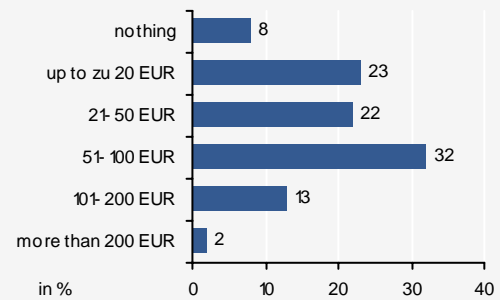


²⁶ Comp. Kaumann/Siegenheim (2006), p. 498ff.

Price of the Mobile TV-Phone

As we have seen above, to the undecided participants an inexpensive TV-compatible mobile phone is an important factor. When asked how much they would pay for it (chart 81), one quarter (23%) quoted “up to 20 Euros“, another quarter (23%) “up to 50 Euros“, and at least 32% would pay up to 100 Euros.

Chart 81: „How much would you be willing to pay for a TV compatible mobile phone taken out on contract?“ (n=178)



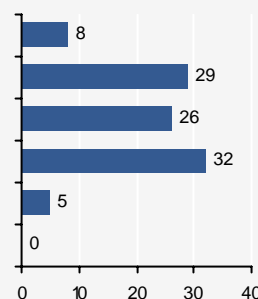
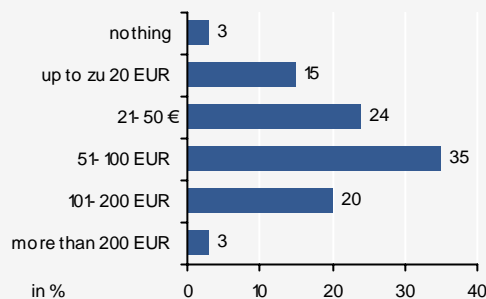
In chart 82 the two major groups of the undecided participants are compared in regard to their willingness to pay. Here it shows that those who would “rather not“ want to use the service more often wanted to spent less then 50 Euros.

Of the “possible users“ 42% would be prepared to spend up to 50 Euros. Consequently an inexpensive mobile phone should not cost more than 50 Euros. The absolute limit for a TV-compatible mobile phone is certainly below 100 Euros. Here our technology-affine sample shall be considered again certainly where the willingness to pay more for a new TV-compatible mobile phone is certainly above the average of potential customers.

Chart 82: Willingness to pay for a new TV-compatible mobile phone -Intent of use

Possibly (n=66)

Rather not (n=78)



Programme Offer

At the end of the test it turned out that the provision of a wider range of programme offers, i.e. of a mobile phone-specific programme offer, was less important for a positive buying decision treasonable selection of end devices. The determination of priorities was based on test experiences with a comparatively attractive programme offer. To put it in another way: The deficits perceived were comparatively small because as far as the key issues are concerned the programme offer met the participants' expectations. Especially the complete TV-programme of major broadcasting stations and the World Cup matches were available. This does not imply that a more attractive offer would not attract more customers, but from the participants' point of view the technical availability of the service at the preferred locations left a lot more to be desired than the programme offer as such.

The participants felt that most important deficit of the TV-programme was the fact that the major private broadcasting stations were not included. If the participants would have been asked to choose four programmes first of all they would have opted for ARD, ZDF, and N24, followed by Pro7, RTL, MTV, and Sat1 (comp. chart 61). When asked which other programmes should be available 40%, i.e. 35% quoted Pro7, Sat1, and RTL (comp. chart 49). These deficits could be an important reason for the slack use of entertainment genres and the concentration on information broadcasts. However, this study can not answer the question whether or not a wider range of entertainment offers would help to boost the reception of entertainment broadcasts and the interest in entertainment motives.

Rates of Mobile TV- and Radio Services

At the end of the test more than 80% of test participants would have been prepared to pay an additional monthly fee for the service. This includes those also who would rather not use the service. However, almost 60% would not pay more than 5 Euros per month for it (chart 83).

We have asked for the willingness to pay at different phases of the test: before the start of the test, during the World Cup, and at the end of the test. When comparing the three points in time for development of the willingness to pay first of all it becomes apparent that the participants had quoted much higher rates before the test started. This tells us that we should be very careful when analysing the claims of the willingness to pay which were made before the participants tried out the service. Even during the weeks of excitement over the World Cup the willingness to pay was much lower already than stated in the questionnaire before the test (chart 84).

Chart 83: Willingness to pay as a monthly fee for mobile TV at the end of the test (n=176)

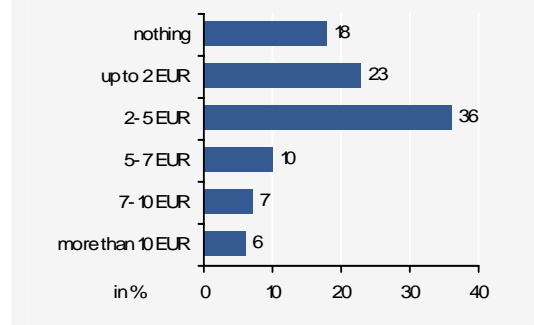
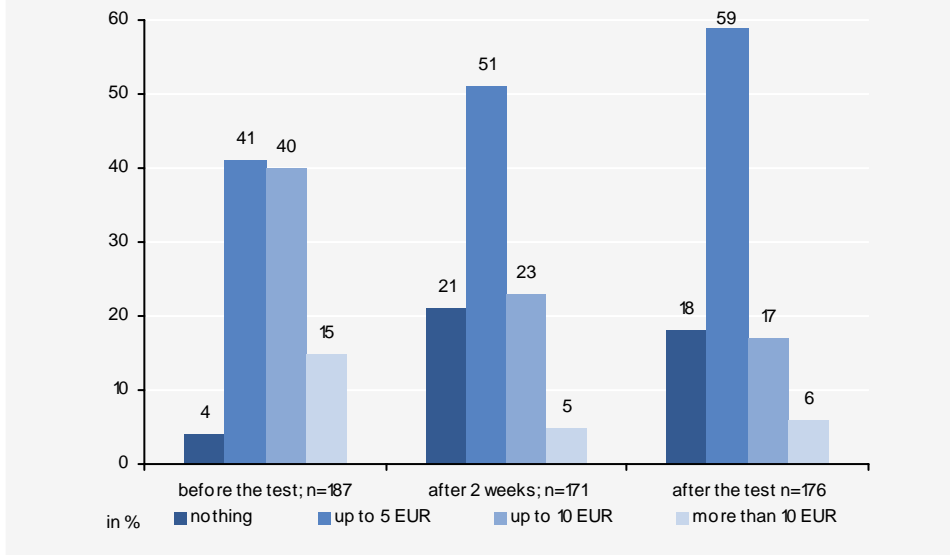


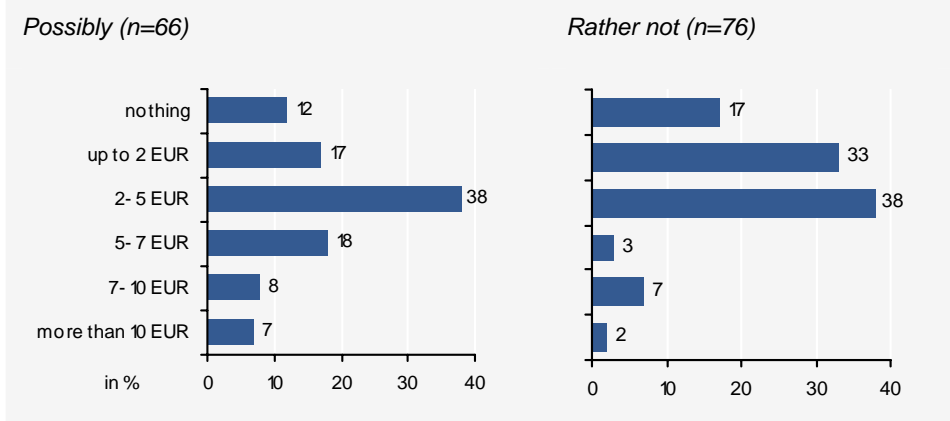
Chart 84: Willingness to pay for mobile TV before the test, during the World Cup and at the end of the test



Secondly the comparison reveals that at least in our sample five Euros were a marginal value which was emphasized more and more during the course of the test. At the end of the test less than a quarter of the participants were prepared to surmount this threshold, and even during the World Cup less than 30% had been willing to pay more.

When the test ended a definite limit of a 5 Euros – fee for the service was established also for those test participants who would “possibly” or “rather not” use the service. 88% of the group who would “rather not” use the service would still pay up to 5 Euros. After all, amongst the “possible” users at least 33% would be prepared to pay more than 5 Euros (chart 85).

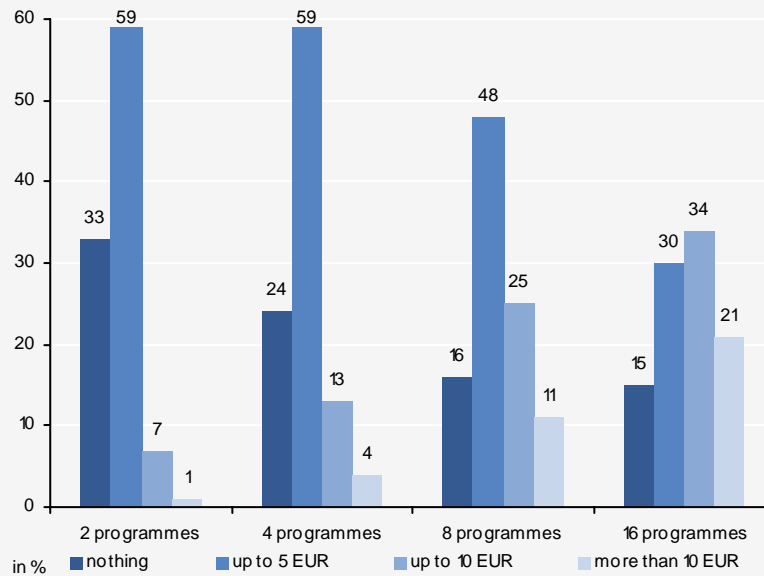
Chart 85: Willingness to pay as a monthly fee for mobile TV on top of the existing mobile phone charge – Intentions of use



9. Requests for Improvements

The results of another approach - willingness to pay dependent on the number of available programmes (chart 86) – were stable all the way through: up to 5 Euros for two to four receivable programmes. Only when the number of programmes available was increased to 8 to 16 more test participants were prepared to surmount the marginal value of five Euros and to pay up to ten Euros.

Chart 86: Willingness to pay depending on the number of programmes offered (n=163)



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Literature

- Beck, Klaus (1994): Medien und die soziale Konstruktion von Zeit. Über die Vermittlung von gesellschaftlicher Zeitordnung und sozialem Zeitbewußtsein. Westdeutscher Verlag, Opladen.
- Bertele, Christopher (2006): Tageschau auf dem Handy. In: Telecom Handel Nr. 13/2006, S. 22.
- BITKOM (2006): Daten zur Informationsgesellschaft 2006. Status Quo und Perspektiven Deutschlands im internationalen Vergleich.
< http://www.bitkom.org/files/documents/daten_broschuere_2006.pdf >
(Download vom 14.11.2006).
- Bmcoforum (2006): Mobile Broadcast Business Models. A State Of The Art Study. http://www.bmcoforum.org/fileadmin/user_upload/Downloads/Business_Models_Study.pdf > (Download vom 14.11.2006).
- Brodersen, Björn (09.07.2006): Die Erfolgskriterien für Handy-TV. BT gewinnt überraschende Erkenntnisse aus Pilotprojekt.
< <http://www.teltarif.de/arch/2006/kw27/s22292.html> >
(Download vom 14.11.2006).
- Brown, Barry; Green, Nicola; Harper, Richard (2002): Wireless World. Social And Interactional Aspects Of The Mobile Age. Springer Verlag, London.
- Bundesnetzagentur (2006): Jahresbericht 2005.
< <http://www.bundesnetzagentur.de/media/archive/5278.pdf> >
(Download vom 14.11.2006).
- Burkart, Günter (2000): Mobile Kommunikation. Zur Kulturbedeutung des "Handy". In: Soziale Welt. Zeitschrift für sozialwissenschaftliche Forschung und Praxis; Jahrgang 51, Heft 2/2000, S. 209-231.
- Geese, Stefan; Zeughardt, Claudia; Gerhard, Heinz (2006): Die Fußball-Weltmeisterschaft 2006 im Fernsehen. Daten zur Rezeption und Bewertung. In: Media Perspektiven Nr. 9 / 2006, S. 454-464.
- Gerhard, Heinz (2006): Die Fußball-WM als Fernsehesevent. Analyse der Zuschauerakzeptanz bei Fußball-Weltmeisterschaften 1954 bis 2006. In: Media Perspektiven Nr. 9 / 2006, S. 465-474.
- Green, Nicola (2002): On The Move. Technology, Mobility, And The Mediation Of Social Time And Space. In: The Information Society. An International Journal; Volume 2002, Nr. 18, S. 281-292.
- Grenn, Nicola (u.a.) (2001): Configuring The Mobile User: Sociological And Industry Views. In: Personal And Ubiquitous Computing; Volume 2001, Issue 5, S. 146-156.
- Haddon, Leslie (2001): From Mobile To Mobility: The Consumption Of ICTs And Mobility In Everyday Life.
< <http://members.aol.com/leshaddon/Mobility.html> >
(Download vom 14.11.2006).
- Hagenhoff, Svenja (Hrsg.) (2006): Internetökonomie der Medienbranche. Universitätsverlag Göttingen, Göttingen.
- Hamill, Lynne; Lasen, Amparo (2005): Mobile World. Past, Present And Future. Springer Verlag, London.
- Hanekop, Heidemarie; Wittke, Volker (2006): Die Entwicklung neuer Formen mobiler Kommunikation und Mediennutzung. In: Hagenhoff, Svenja (Hrsg.): Internetökonomie der Medienbranche. Universitätsverlag Göttingen, Göttingen, S. 109-137.

- Hans-Bredow-Institut (Hrsg.) (2006): DocuWatch Digitales Fernsehen. Eine Sichtung ausgewählter Dokumente und wissenschaftlicher Studien. Hamburg.
- Höflich, Joachim; Gebhardt, Julian (2005): Mobile Kommunikation. Perspektiven und Forschungsfelder. Peter Lang Verlag, Frankfurt am Main (u.a.).
- Heß, Jan; Hauptmeier, Helmut; Becker, Thomas (2006): TV2010 – Mission Complete? Digital Forerunners und neue Medienkultur. Siegen.
< <http://www.sceneo.de/tv2010.php> >
(Download vom 14.11.2006).
- Katz, James E. (2003): Machines That Become Us. The Social Context Of Personal Communication. Transaction Publishers, New Brunswick/New Jersey.
- Katz, James E.; Aakhus, Mark (2002): Perpetual Contact. Mobile Communication, Private Talk, Public Performance. Cambridge University Press, Cambridge (UK).
- Kaumanns, Ralf; Siegenheim, Veit (2006): Handy-TV – Faktoren einer erfolgreichen Markteinführung. In: Media Perspektiven Nr. 10/2006, S. 498-509.
- Kuhlmann, Christoph; Wolling, Jens (2004): Fernsehen als Nebenbeimedium. In: Medien & Kommunikationswissenschaft (M&K) 53. Jg., Nr. 3/2004, S. 386-411.
- Ling, Rich (2004): The Mobile Connection. The Cell Phone's Impact on Society. Morgan Kaufmann Publishers, Amsterdam (u.a.).
- Lloyd, Emma; Ross, Maclean; Stirling, Andrew (2006): Mobile TV – Results From The BT Movio DAB-IP Pilot in London.
< http://www.ebu.ch/en/technical/trev/trev_306-movio.pdf >
(Download vom 14.11.2006).
- Mai, Lothar (2006): Die Fußball-Weltmeisterschaft 2006 im Radio. Daten zur Rezeption und Bewertung. In: Media Perspektiven Nr. 9/2006, S. 475-477.
- Oudshoorn, Nelly; Pinch, Trevor (2003): How Users Matter. The Co-Construction Of Users And Technologies. The MIT Press; Cambridge (MA), London (UK).
- Reichwald, Ralf (Hrsg.) (2002): Mobile Kommunikation. Wertschöpfung, Technologien, neue Dienste. Gabler, Wiesbaden.
- Reitze, Helmut (Hrsg.) (2005): Media Perspektiven Basisdaten. Daten zur Mediensituation in Deutschland 2005. Frankfurt am Main.
- Reitze, Helmut; Ridder, Christa-Maria (Hrsg.) (2006): Massenkommunikation VII. Eine Langzeitstudie zur Mediennutzung und Medienbewertung 1964-2005. Schriftenreihe Media Perspektiven, Band 19. Nomos Verlagsgesellschaft, Baden-Baden.
- Vorderer, Peter (1992): Fernsehen als Handlung. Fernsehfilmrezeption aus motivationspsychologischer Perspektive. Edition Sigma, Berlin.
- Williams, Robin; Edge, David (1996): The Social Shaping Of Technology. In: Research Policy, Volume 25, S. 856-899.