

**Mobile Internet Adoption and Use:
Results from a National Survey in Sweden**

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Oscar Westlund & Erik Bohlin**

Abstract

The past decade has seen great developments in the telecom sector. The mobile phone has changed from being a communication device, to become a multimedia device. It provides always-on connection to internet and acquaintances beyond time and space. The diffusion of these mobile devices is taking place rather rapidly in the Western world. People have become equipped with portable micro-computers that enable multimedia – mobile devices provide their users with a variety of functions and services such as video, audio and internet. However, actual use of mobile internet seems to be limited in most countries, except for leading nations such as Japan and South-Korea. There is a lack of knowledge about the emerging situation in Western countries. This paper analyses Sweden as a case of a Western country among the international leaders of ICT-diffusion. It is a country that possesses many similarities with other well developed countries, and should in such sense offer valuable insight. The paper closely examines the use of different types of mobile internet services among specific user segments. It also addresses important adoption criteria through an analysis of attitudes and expressed needs for using internet services in the future. The empirical data base is based on a comprehensive national postal survey carried out in Sweden during the fall of 2007. The survey was sent to 2000 Swedes aged 16-65 and the response rate of the survey was 39%. Evaluations of its representativeness indicate that it corresponds rather well to the Swedish public in this age segment.

Introduction

We have entered a new media and ICT landscape where digitalization, convergence, social trends and hopes for future economic revenue drives the developments of ubiquitous and social media. The notion of internet 2.0 is becoming realized, and the dream of mobile 2.0 is emerging. There is no doubt that, from a technological perspective, the mobile phone has become a multi medium device.

Multimedia is media that enables content and information processing through audio, video, graphics, text and animation. The mobile device can be used for browsing internet, taking and sharing photos, using navigation systems, but also to enjoy videos and music. There is extended knowledge about the developments of the technological architecture of the mobile, but less knowledge regarding what the mobile has and will become from a user perspective.

Diffusion researchers (Rogers 2003) have inspired numerous studies measuring possessions. However, previous accounts indicate a severe gap between the penetration rate measured as possessions of internet-enabled devices, and the actual use of the mobile for internet. Possessing mobile internet does not necessarily reflect an active interest in using the mobile for internet; it is simply integrated in the functionality in most mobile devices bought nowadays. It is only by studying actual usage that we learn about the true adoption of mobile internet. Having this as the departure point, this paper has two main research questions. The first research question empirically examines how different types of mobile internet content are used among specific user segments. The second question of interest is naturally to grasp what criteria's are important in order for adoption to spin off. Taking the starting point in previous research about important adoption criteria, the paper examines factors related to usability, user-friendliness and costs.

The paper analyzes Sweden as a case of a Western country among the international leaders of ICT-diffusion. Sweden has a widespread access to both internet and mobile internet in Sweden – through highly developed broadband, WiFi and 3G-networks. The penetration rate of mobile devices to Swedish households has since long passed ninety percent. The potential for using the mobile for internet can be considered as very good, but the mobile is still mostly used for voice calls and SMS (Bolin 2007). These patterns are similar to other Western countries, and the analysis should therefore provide valuable insights.

Our analysis is based on a nationally representative quantitative survey called *The Mobile Barometer*¹, which was carried out in Sweden during the fall of 2007. The survey was sent by post to 2000 randomly chosen people aged 16-65 in Sweden. The net response rate was 39 percent and there were a total of 764 respondents. A comparative analysis to other statistical accounts of the Swedish population shows that the Mobile barometer has a slightly higher amount of married people and people with high education. The overarching conclusion is however that the composition of the survey respondents corresponds well with the Swedish population

Current use and future adoption of mobile internet: setting the context

This section will set the context for the two research questions by introducing relevant studies and approaches in the area. The first research question focuses the use of mobile internet among specific adopter groups. The Online Publishers Association has studied mobile internet penetration among the five largest countries in Europe. A conclusion from their study is that although seven to eight out of

¹ *The Mobile Barometer* is administered by Oscar Westlund at the Department for Journalism and Mass Communication at University of Gothenburg and Erik Bohlin at the Department of Technology Management and Economics, Chalmers University of Technology. Support from NTT DoCoMo Mobile Research Institute and Chalmers University of Technology is gratefully acknowledged.

ten users have mobile internet, only about half of them actually use it (OPA 2006). Previous studies indicate that the adoption of using mobile internet services among users has for long been seen as rather limited (Wilson 2006, OPA 2006) although countries such as Japan make an exception (Matsuda 2005). In Europe, the Nordic nations, United Kingdom and Italy are all described as nations with a relatively high diffusion of mobile internet in terms of 3G (umts forum, 2008). In 2006 Telephia carried out an analysis of the use of mobile internet among European countries. Their findings illustrate that Sweden has among the highest amount of users, followed by Italy, Spain, France and the U.K. It is on the other hand Italians that have the highest average of downloaded mobile internet data per week (Telephia 2006).

Everyone dispose of 24 hours per day. Those hours are spent not only on media and ICT, but also on sleep, work, social activities etc. Media and ICT provide people with different sets of functions. While media such as newspapers are oriented towards providing an information function, other media such as TV are more oriented towards entertainment. The important matter is how different media are perceived and used by their users (Weibull 1989). This theoretical perspective comes from media studies, but is relevant in discussions of using the mobile as a multi medium. The mobile is sometimes compared to a Swiss army knife that can be used for numerous functions. These different functions are of course competing with other options offered by other media and ICT's. For example, people can retrieve information about weather forecasts not only through the mobile but also TV, radio, newspaper, computers etc. The relative advantage in the domestic situation may be inferior to other options, while it is superior while on the go. The argument is that we must understand the use of the mobile for multi media functions in relation to users' access to other media and ICT. In western countries people have access to media and ICT, and the relative advantage of the mobile is in many cases inferior. However, since it can be used independent of temporal and spatial structures, it allows for new user situations.

Some people are interested and have a need for using their mobile in new and innovative ways, while others have no such need at all. In the so often used diffusion theory, Rogers (2003) outlines five types of adopters; innovators, early-adopters, early majority, late majority and laggards. During the current situation, people using mobile internet services can be seen as early adopters. However, one should not assume that all adopter groups actually will adopt. Different international studies indicate that early-adopters of internet related services for mobile devices are men, young adults, as well as people with a high income and educational level (Matsuda 2005, Versakalo 2006, Ohlsson 2007, OPA 2006, Kivi 2007) and sometimes also with an above average interest in technology (Constantiou 2006, Westlund 2008).

Studies from Sweden illustrate that the early adopters of mobile internet and news services in 2006 were predominantly men, teenagers and young adults. Most people who browsed internet with their mobiles also used it for news services (Westlund 2007a). An analysis of adoption of mobile internet services among different groups and between 2006 and 2007 shows only a minor increase in the number of users between the years. The more interesting change between the years was that mobile internet adopters had started to use it more frequently. This signifies that mobile internet is slowly starting to become part of the everyday usage patterns among specific groups. Similar types of early-adopter groups were identified for 2007 as for 2006 (gender & age). Additionally, it is evident that early-adopters are commonly found among people with some type of subscription model, people with high income, a great interest in technology, and among people who use 3G-devices (Westlund 2008).

When it comes to the first research question the discussion at hand should have illustrated the current use among specific groups. Little is known about how people use different types of content while using the mobile internet. MMS and downloading games and ring tones seem to be rather popular, although

these activities are not necessarily associated to browsing the mobile internet. As mentioned, there are some studies about the use of news with the mobile device. Although there are additional studies regarding the use of mobile content, this is a little researched area. That is a good reason to empirically investigate this issue in this paper.

Moving on to the second research question, now follows an introduction to some current research on adoption criteria for mobile internet. Pagani (2004) has studied the adoption of 3G-services in six countries. Her conclusion is that usability, user-friendliness, price and transfer speed are determining criteria for adoption. Another global study indicates that there are three major sources of dissatisfaction for mobile internet users; 1) site load time, 2) site navigation, and 3) user friendliness OPA (2006). Several researchers have proposed that mobile internet services should be useful, functional and easy to use (Pedersen & Methlie 2004, Akesson and Eriksson, 2007, Kargin and Basoglu, 2007). There must be a balance in complexity and usefulness, as well as a great variation in the amount of available content and functions. When it comes to the cost issue, it is evident that vague terms of use can slow down adoption. An international quantitative study reported that users prefer flat-rate pricing model since it provides a higher level of security (Mitomo 2007). A Swedish qualitative study with young adults indicates that these people experience a high degree of uncertainty, and that this stopped them from using mobile internet services (Westlund 2007b). A conclusion is that attributes along the dimensions of costs and usability/user friendliness have shown to be important factors in previous research.

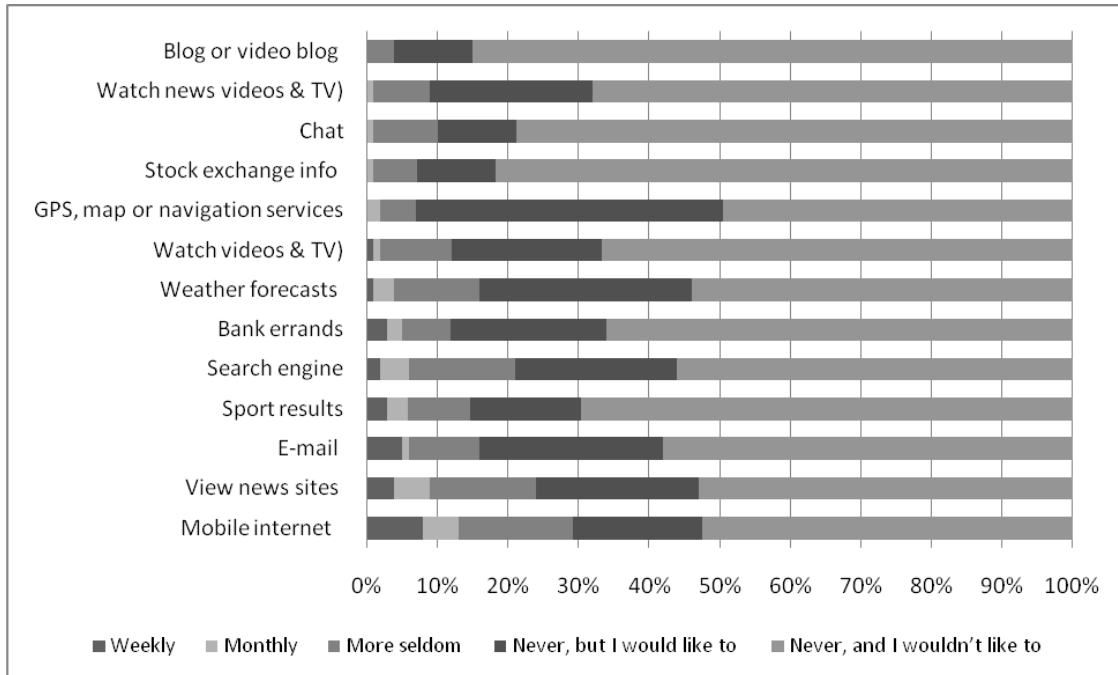
Using the mobile device for internet: Sweden in 2007

Almost all Swedes aged 16-65 possess a mobile device, and if they have bought it during the past five years it can most likely be configured to be used for mobile internet. Considering the exchange rate of mobile devices, most mobile devices used by Swedes are less than two years old. However, slightly less than half of the Swedish population expressed that they have internet-enabled mobile devices. In reality it could be more, but this is the amount that is aware of it. Among this group only 17 percent actually use mobile internet at least once a month. Many of those who are aware that they have acquired an internet enabled mobile device still have no intention to use it as such. The previously discussed gap between possession and use of mobile internet is thereby apparent also in Sweden in 2007, strengthening the argument to study usage rather than possession.

This introducing section outlines *what* types of internet services people use. Figure 1 illustrates the usage of different mobile internet services in 2007 among the Swedish population. The first observation is that for all included services, more than half of the population do not use such services at the moment, and have no interest in doing so in the future neither. For most of the categories about ten to twenty percent do not use these services in 2007, but expressed an interest in doing so in the future. GPS, map or navigation services makes an exception – more than forty percent wish to use such services in the future. While most Swedes have other media technologies such as computer internet, that already function for the other services. There are on the other hand few alternatives for positioning services.

Figure 1 illustrates three levels of usage frequencies; at least once a week or month, and more seldom. For most types of internet services, the frequency of usage is rather low. There are several potential explanations to this. Some may have tried the services once or so but have never repeated it. The reason might be that they were not satisfied with their user experience. Others do use these services every now and then, but only at special occasions – such as on a trek in the nature, feeling a need to get an updated weather forecast.

Figure 1 – Use of mobile internet services in Sweden in 2007 (percent)



Source: Mobile Barometer 2007 postal survey

Comment: Number of respondents varies between 724 and 734.

The analysis of monthly and weekly users illustrates that less than one in ten use the different internet services with such frequency. The definition of what is frequent use varies in media audience research. Concerning traditional media such as newspapers, TV and radio it is often several times a week, while it is less for going to the cinema and reading periodicals. This paper will apply the definition of frequent users as those using it at least once a month.

The internet services presented in figure 1 with the least number of frequent users are blogs/videoblogs, videos, chat, stock exchange information and bank errands. Viewing news sites and using the mobile device for search engines, e-mail, sports results and bank errands are the most used services. A comparison of weekly and monthly user distributions shows that only about half use most of these services within their weekly routines. E-mail makes an exception; those who have engaged in using e-mail with their mobile device do so at least weekly.

The following analysis will focus at those internet services that were identified in figure 1 as having slightly more frequent users. Table 2 outlines *which groups* use different internet services the most and the least. The *mobile internet* category will be used as a frame of reference. Table 1 identifies differences and similarities among different groups – depending on socio-demographic and technological background factors. The numbers of respondents for each group varies, and are in some cases rather small. Due to the margin of error, one must be cautious when making conclusions.

Table 1 Monthly usage of mobile internet services among different groups in 2007 (percent)

	Mobile Internet	Search engine	E-mail	News sites	Weather	Sports	Banking	Least n
Everyone	13	6	6	9	4	5	5	717
Gender								
Man	20	11	9	15	5	9	7	335
Woman	8	3	4	4	3	2	4	392
Age								
16-29 years	19	8	5	9	2	3	5	173
30-49 years	18	9	8	13	6	7	6	283
50-65 years	4	3	4	4	3	3	4	269
Payment model								
Private pre-paid	7	3	2	3	2	2	5	230
Private subscription	12	5	3	10	4	7	5	298
Employee subscription	24	14	17	16	7	7	7	161
Income level								
Low income	10	3	3	5	2	2	4	203
Middle income	13	7	5	10	3	5	6	237
High income	16	9	9	12	6	7	6	254
Technology dimension								
Interest in technology	21	12	11	13	6	7	6	291
Do not know network	5	2	3	3	2	1	3	237
GSM/GPRS-network	12	6	4	8	2	5	5	381
3G-network	35	14	17	26	16	12	10	93
Has internet	26	13	12	17	7	9	7	350

Source: Mobile Barometer 2007 postal survey

Comment: Number of respondents varies slightly between the different categories. Least n refers to the least number of respondents in all categories for the given group variable.

There is a gendered dimension in the use of internet services – men are more frequent users. This pattern is especially prevalent concerning usage of search engine, news sites and sports. For these services, about one in ten of all men is a monthly user. The usage of news sites is exceptionally high in comparison – witnessing a type of content/service that appeals to be used in the mobile.

The age structures of mobile internet users illustrate a gap between those aged 16-49 years in comparison to those aged 50-65. Among both the 16-29- and the 30-49 year group, about one in five use internet services monthly. This homogeneity in user patterns applies also to the usage of search engine and banking services, but not the other services. The 30-49 year group uses all of the internet service categories included to a greater degree than do 16-29 year group. Especially news-, weather- and sports services are used by a larger portion among the 30-49 year group.

There are significant differences in usage between different user groups dependent on which payment model they use. A general pattern is that people with pre-paid cards use internet services little, while it is slightly higher among those with private subscription, and much higher among employee subscribers. Those with private subscription do not have to worry that they will run out of money so that they can't make a call if they have to. Meanwhile, people with employee subscription are even less likely to worry since their company pays the bill. The employee subscribers are especially keen on using internet search engines, manage e-mail, and visit news sites. These types of services are very information oriented, and can to some extent be seen as associated to the lifestyle of blue collar workers. On the other hand, their use of sports-, banking- and weather services is rather similar to the other groups. These internet services provide different types of functions, but are more associated to the private lifestyle. Regarding

income levels, the general pattern is that usage is higher among people with high income level. This pattern is most obvious when it comes to using e-mail and weather reports, while it is difficult to argue that there are significant differences for banking services.

There is also a technology dimension in the use of mobile internet services. First of all, people who express a great interest in technology are overrepresented as users of mobile internet services. Regarding using search engines, manage e-mail, and visit news sites – the amount of users is twice as high among people with technology interest compared to the public. Technology interest is also reflected in people's choice of mobile network – and their awareness of such. When asked about the type of network the individual uses, they could choose from *GSM/GPRS*, *3G*, *HSPA* and *do not know*. Those who do not know are probably rather uninterested in the technological potential for using their mobile for internet services – which is reflected in how they actually use those services. This group are rather underrepresented as users their mobiles for internet services. The user patterns of the *GSM/GPRS* group correspond well with the usage among the Swedish public as such. The usage of internet services is clearly the highest among the *3G*-users – about three times as high as the *GSM/GPRS* group. Their usage is especially high in comparison to other groups when it comes to using e-mail and seeking weather reports. From a statistical perspective, the low number of respondents makes the result somewhat uncertain. However, the trend is evident, and is also supported by previous research (Versakalo 2006, Kivi 2007). In a similar way it was asked if the users have internet, and the results show that those who have (aware that they have) internet indeed use internet services more than the public. There is an indication that users who possess *WLAN* in their mobile use it more for internet services than other groups' do (The result is not shown in the table due to a small number of respondents, and should be interpreted with particular caution). This indication makes sense, taking the relative advantage in transfer speed and costs that *WLAN* offers into consideration.

Examining adoption criteria for mobile internet

From the results in figure 1 it was not only evident that a minority of Swedes do not use mobile internet services, but also that more than half of them have no interest in doing so in the future neither. Learning from qualitative research with young adults in Sweden, these people are not likely to adopt mobile internet even if the conditions of usage are significantly improved (Westlund 2007b). The adoption criteria analysed in this section are relevant only to those who have an interest in using mobile internet from the start. From previous research it was concluded that attributes along the dimensions of costs and usability/user friendliness are likely to be important adoption criteria. Therefore the analysis will focus at factors along these dimensions. The paper first analyses two statements related to the cost dimension, and secondly three statements related to the usability/user friendliness dimension.

The mobile barometer survey included a set of attitude questions that will be used to analyse important attitude dimensions. For each attitude statement, the respondents could choose *no opinion* or a number on a scale ranging from 0 to 10, where 10 means to fully agree. In the analysis, agreement to the statement was defined as the responses within the interval 7-10. The following tables illustrate the attitudes among all Swedes – not only people with an opinion. The results are rather different if the analysis excludes people without an opinion – which in all cases means that the amount who agrees to a statement increases. For most statements there are several groups where about half have stated that they do not have an opinion.

The meaning of the category *no opinion* for the different questions is complex and uncertain. The interpretation of the data is naturally difficult when a large amount marked the alternative no opinion. Most likely it is people with little interest and experience of mobile internet services that have

expressed that they do not have an opinion. Our starting point for the interpretation of the coming tables is; among groups with a relatively low degree of people without opinion, the agree/disagree dimension will be more adequately reflected. Not surprisingly it is mostly among existing user groups people with opinions are identified. Therefore their answers on the agree dimension are the most interesting. Meanwhile, the high amount of people without opinions is clearly a very important and interesting result. The degree of no opinion answers reflects the level of experience and engagement among the public concerning issues of mobile internet. In the tables, the numbers shown are the amounts agreeing among the public. By presenting the results of the attitudes among the public, the best illustration of the general situation in Sweden is given.

The importance of the cost dimension

The first statement *I am not sure about how much it costs to access internet with my mobile* address the degree of uncertainty about costs. 43 percent of the population is uncertain, and just as many expressed that they have no opinion. Concerning this question it is likely to interpret those without an opinion as being unsure about the costs as well. The results show that a striking majority express an uncertainty about costs. The amount of people that agrees is higher among the groups previously identified as early adopters; men, 16-49 year old, subscribers, and people who has internet or 3G. Meanwhile, the amount of people expressing no opinion is considerably lower. A likely explanation is that the early adopter groups have an opinion because of their personal experience as users – but that they are still not sure about the costs. The analysis further illustrates important differences in attitudes between users and non users of mobile internet. About six out of ten among the users express a feeling of uncertainty about the costs for usage, while only one third do so among the non-users. The reason is that far more people among the non-users do not have an opinion in the matter.

Uncertainty about costs prevents people from using mobile internet. Does this mean that a flat rate business model would stimulate rapid adoption? The analysis of the second statement, *with a fixed price for browsing I would use the mobile more for internet*, provides some answers. Clearly not everyone would use the mobile more for internet services, but at least about twenty five percent would increase their usage. The early adopter groups are expressing this opinion to a greater degree than others. Also among 16-29 year olds and people with great interest in technology there is a significantly higher usage. This interest is even higher when analysing users who have 3G or have expressed that their mobile device has internet. These people have acquired a mobile handset with the capacity for mobile internet – but the cost issue restricts their usage.

Table 2 Attitude to cost related matters for mobile internet services among different groups

in Sweden 2007 (percent)

	Uncertain about costs	Use more with flat-rate	Least n
Everyone	43(44)	25(48)	727
Gender			
Man	45(37)	33(38)	334
Woman	41(49)	18(57)	394
Age			
16-29 years	60(20)	35(29)	174
30-49 years	46(40)	28(46)	287
50-65 years	29(63)	17(62)	265
Payment model			
Private pre-paid	35(54)	19(55)	229
Private subscription	46(40)	27(44)	301
Employee subscription	47(39)	31(47)	161
Income level			
Low income	41(43)	23(52)	205
Middle income	40(46)	25(44)	240
High income	46(41)	28(48)	255
Technology dimension			
Interest in technology	50(35)	35(36)	294
Do not know network	36(57)	16(64)	240
GSM/GPRS-network	46(39)	26(43)	381
3G-network	51(29)	43(29)	94
Has internet	62(18)	40(28)	351
Usage of mobile internet			
Never	34(58)	13(61)	509
More seldom	66(13)	46(23)	118
Monthly	62(2)	64(7)	95

Source: Mobile Barometer 2007 postal survey

Comment: The figure shows the people who have agreed to the different statements, and the amount of people without opinion are shown within the parenthesis. The respondents could choose on a scale from 0 to 10, where 10 was fully agree. In this illustration, agree is defined as the interval 7-10. The number of respondents varies from 161 to 727 for all categories except 3G (94) and monthly users of mobile internet (95). The results for these categories should be analysed with particular caution, although they still indicate a significant change also when the margin of error is taken into consideration.

An interpretation of the discussed results is that the introduction of flat-rate predominantly would have the effect that the early adopter user groups increase the frequency of their usage. This dimension is analysed through the cross-tabulations of attitudes among existing users and non-users of mobile internet. About two thirds of the monthly users would increase their usage if they were paying their costs based on a flat-rate business model. Among more seldom users 46 percent would increase, while only 13 percent would do so among the non-users. This confirms the conclusion that flat-rate stimulates existing users to use mobile internet more, but does little to attract new users.

Dimensions of user-friendliness and usability

The first statement, *internet in the mobile is above all good in situations when I do not have access to a computer*, concerns the perceived usability of mobile internet services. It acknowledges that people's usage of media and ICT's does not take place as if isolated from other alternatives. 29 percent agree to a statement that give the mobile the role of a complement to the computer for internet (36 percent had no opinion for this statement). Among the identified user groups, the amount that sees the mobile as a complement is higher and the amount without opinion is lower. This is especially obvious when it

comes to employee subscribers and the technology dimension. The analysis of the user groups illustrates the most prevalent differences; 17 percent of non-users agree, compared to 73 percent among the monthly users.

Table 3 Attitude to usability and user-friendliness related matters for mobile internet services among different groups in Sweden 2007 (percent)

	Complement to the computer	Slow transfer speed	Difficult to overview	Least n
Everyone	29(36)	25(60)	31(56)	727
Gender				
Man	33(32)	33(48)	36(47)	334
Woman	26(41)	18(69)	27(63)	394
Age				
16-29 years	34(18)	38(39)	49(30)	174
30-49 years	33(33)	29(58)	37(53)	287
50-65 years	21(52)	12(75)	14(75)	265
Payment model				
Private pre-paid	21(46)	15(70)	23(65)	229
Private subscription	29(33)	29(59)	34(54)	301
Employee subscription	41(32)	32(50)	37(48)	161
Income level				
Low income	25(42)	23(60)	30(54)	205
Middle income	32(34)	25(59)	29(57)	240
High income	31(34)	27(58)	35(55)	255
Technology dimension				
Interest in technology	40(27)	36(47)	38(45)	294
Do not know network	19(49)	14(74)	18(71)	240
GSM/GPRS-network	30(33)	28(56)	35(52)	381
3G-network	47(21)	43(38)	51(32)	94
Has internet	44(22)	43(34)	51(29)	351
Usage of mobile internet				
Never	17(47)	12(79)	17(75)	508
More seldom	45(19)	53(24)	64(18)	119
Monthly	73(2)	62(3)	65(2)	95

Source: Mobile Barometer 2007 postal survey

Comment: The figure shows the people who have agreed to the different statements, and the amount of people without opinion are shown within the parenthesis. The respondents could choose on a scale from 0 to 10, were 10 was fully agree. In this illustration, agree is defined as the interval 7-10. The number of respondents varies from 161 to 727 for all categories except 3G (94) and monthly users of mobile internet (95). The results for these categories should be analysed with particular caution, although they still indicate a significant change also when the margin of error is taken into consideration.

Then do people think that *it is difficult to get an overview of the content of mobile internet?* 31 percent among the public think so, which is slightly more compared to the amount that believe the transfer speed is slow. The patterns are however similar between these two statements; men, young adults, and employee subscribers are differentiated. Once again the technology inclined groups agree to a greater extent than others – especially those who know that they have internet or use 3G-devices. There are great differences between users and non-users. About two thirds of the users believe it is difficult to overview the content – and they are actually talking from their own experience. 25 percent of those who never use mobile internet still have an opinion, and about half of these believe the content is difficult to overview.

When it comes to the following two statements, *internet in mobiles is too slow* and *it is difficult to get an overview of the content of mobile internet*, these illustrate aspects of the user-friendliness dimension. 25

percent of the population think that the transfer speed is too slow (60% do not have an opinion). Once again, the early adopters more often have an opinion and agree to the statement. It is rather evident that men and subscribers agree more than their counterparts, and even more distinctive among the 16-29 year old. Similar differences occur concerning the technology dimension. It might seem awkward that a higher amount of people among those with 3G-network agree than among people with GSM since the latter in reality has slower transfer speed. Meanwhile, the amount of people without an opinion is 56 percent for GSM and 37 percent for 3G. The explanation is that among GSM users there are fewer people who have experience to judge whether internet in the mobile is slow or not. The pattern becomes clearer when analysing the responses among different user groups. Among those who never use mobile internet, 12 percent perceive it as too slow and 79 percent do not have an opinion. Among the monthly users on the other hand, 62 percent think that it is too slow and only 3 percent do not have an opinion. A conclusion is that a majority of the users think that it is too slow – but it can also be stressed that about one third do not agree to this. This of course depends on the type of network used, and it was noticed that among 3G-users fewer people believe it is slow.

The continuation of the mobile media dream

Mobile internet services can be used on the go, wherever and whenever. The mobile has become a ubiquitous multi medium device, and there is great interest in developing the mobile content ecosystem. Browsing current discussions in the industry and among academics, a dream of mobile media evolves. There is much hope for the future business of the mobile device. The first research question of the paper has illustrated the current state of usage related to different types of mobile internet services. The empirical research has been carried out in a country sharing many characteristics with other leading ICT nations. The current use of internet services can be seen as rather low, and limited to a set of early adopters with specific characteristics. This is of course depending on ones expectations. It is definitely less than the industry wishes for, and in order to achieve higher adoption there are constant developments taking place.

For example, there are developments of the technological architecture of mobile handsets, but also developments of 4G-networks, by some rather termed as LTE (Long Term Evolution). There is also a constant search for drivers of the development - to find the killer applications. Different actors involved realize the slow uptake of current services offered to the end-consumers. Just as with the introduction of any media, the emerging media imitates the former. Radio imitated newspapers, TV imitated radio and the functionality of mobile internet has to a great extent been similar to traditional websites, but in a limited format. Media and ICT must probably find its own unique proposition to offer something with better relative advantage. The results show that services currently being used currently are traditional types of internet services such as news, e-mail and search engines. Perhaps services with a mobile adapted value proposition will cater better for users. This is at least the reason to the emerging discussions of mobile 2.0. It is being discussed that content and services must be developed specifically for the mobile. One popular idea is to create context-aware and user generated types of services and content. Perhaps these developments can result in a wider uptake of mobile internet.

The paper has illustrated that 70 percent of Swedes do not use their mobile for internet at all in the present situation. Almost twenty percent express an interest in doing so in the future, while the remainder express that they have no such needs. It must be kept in mind that some will not adopt the mobile as a multi medium even if numerous mobile 2.0 services are developed. The question of future adoption is both complex and uncertain. The analysis of adoption criteria illustrates a low level of engagement in mobile internet matters, as people to a large extent have no opinion. There seems to be a great uncertainty about costs associated to using the mobile for internet, which forms an important barrier for future diffusion. Launching flat-rate subscriptions would solve much of these uncertainties, and probably provide a more attractive value proposition for users. An important conclusion is that it is mostly existing users who will increase their use mobile internet with a flat-rate model, not those who have not yet adopted.

The results show that user-friendliness might be an obstacle, considering that almost two-thirds of the users believe that the transfer speed of mobile internet is too slow, and that it is difficult to get an overview of the content. It was further indicated that the mobile is viewed as a complement to other media by its users, at least in comparison with computers. Early diffusion of computer internet actually could have created a barrier for adoption of mobile internet. In most Western countries, including Sweden, people have become customised to the user-friendliness and transfer speed of computer internet. This forms a frame of reference, and therefore they may think that mobile internet is too slow, and also that the screen and keypad of the mobile device is too small. In developing countries on the other hand, many people will have their first encounter with internet through the mobile. Perhaps that is where the true potential market is found?

References

- Akesson, M. & Eriksson, C., (2007) "The vision of ubiquitous media services: how close are we?" in "Human interface and the management of information. Interacting in information environments". Springer Berlin/Heidelberg
- Bohlin, E., Olsson, T.; Westlund, O. (2008) *Mobile barometer 2007 - An analysis of the Swedish mobile society*. working paper, Chalmers & Göteborgs University.
- Bolin, G (2007) The mobile phone as a interpersonal medium and multimedia search tool, ("Mobiltelefonen som interpersonellt medium och multimedialt sökverktyg) in S, Holmberg & L, Weibull (Eds) *The new Sweden (Det nya Sverige)*, SOM-report number 41, Kungälv
- Carlsson, U & Facht, U (2007) *MediaSweden (MedieSverige)*, Nordicom, Kungälv
- Constantiou, I D (2006) *Exploring mobile user's choice of advanced mobile data: a research framework based on referencing and reasoning processes*, Proceedings of the 3rd International CICT conference: Mobile and wireless content, services and networks, short term and long-term development trends, Technical University of Denmark
- Kargin, B & Basoglu, N (2007) "Factors affecting the adoption of mobile services", *PICMET Proceedings*, Portland, pp. 2993-3001.
- Kivi, Antero (2007) *Diffusion and usage of mobile browsing in Finland 2005-2006*, paper presented at "MobileMedia2007", 4th international CICT conference, Technical University of Denmark, 29-30 November 2007
- Matsuda, M (2005) "Mobile communication and selective sociality" in I, Mizuko, O, Daisuke, & M, Matsuda. (Eds) *Personal, portable, pedestrian: mobile phones in Japanese life*, Cambridge, MIT Press
- Mitomo, H (2007) *Flat rate preference in mobile phone usage – a behavioural economics approach*, Presentation at RIDE-seminar at Chalmers University of Technology, May 2007
- McQuail, D (2000) *Mass communication theory*, London, Sage Publications
- Ohlsson, J (2007) *Academics from Gothenburg 2006 – media possession and use among the young and well educated (Göteborgsakademiker 2006 – medieinnehav och medieanvändning bland unga högutbildade)*, JMG report series number 48, Göteborg University
- Online Publishers Association/OPA Europe/TNS, December 2006, URL; www.online-publishers.org, referred to in; WAN. (2007). *World digital media trends*, Special Report, World Association of Newspapers
- Pagani, M (2004) "Determinants of Adoption of Third Generation Mobile Multimedia Services". *Journal of Interactive Marketing*. 18 (3) pp 46-59
- Pedersen, Per E., & Methlie, Leif B. (2004). *Exploring the relationship between mobile data services business models and end-user adoption*, presented at the Fourth IFIP Conference on e-Commerce, e-Business, and e-Government (I3E)
- Rogers, M E (2003) *The diffusion of innovations*, Free Press, New York
- Telephia (2006) URL; www.telephia.com, referred to in; WAN. (2007). *World digital media trends*, Special Report, World Association of Newspapers
- UMTS Forum (2008) www.umts-forum.org (2008-04-15)
- Versakalo, H (2006). *Mobile data service evolution; empirical observations on packet data service adoption*, Proceedings of the 3rd International CICT conference: Mobile and wireless content, services and networks, short-term and long-term development trends, Technical University of Denmark
- Weibull, L (1989) TNewspaper research for the nineties", ("Läsarforskning inför 1990-talet") in L, Weibull & K, Björkqvist (eds) *Newspapers and its readers (Dagspressen och dess läsare)* Stockholm, Almqvist & Wiksell
- Westlund, O (2007a) "The mobile device – a news medium for those with particular high news interest?" ("Mobiltelefonen – ett nyhetsmedium för de särskilt nyhetsintresserade?") In S Holmberg & L Weibull (Eds), *The new Sweden (Det nya Sverige)*, Kungälv, Livréna
- Westlund, O (2007b) "The adoption of mobile media by young adults in Sweden", in G, Goggin & L, Hjorth (Eds) *Mobile Media 2007*, Sydney University Press
- Westlund, O (2008) "Diffusion of internet for mobile devices in Sweden", *Nordic and Baltic journal of information and communications technologies (nb|ict)* Volume 2, issue 1
- Wilson, J (2006). "3G to Web 2.0? – Can mobile telephony become an architecture of participation?", *Convergence*, Vol 12 (2): 229-242, Sage, London