

# Mobile Phone Web Browsing – A Study on Usage and Usability Of The Mobile Web

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## ABSTRACT

Browsing the Web on mobile phones has finally hit the mass. The visualization of websites on latest mobile phone models comes close to what we are used from desktop computers. Tailoring websites for mobile phones seems to be not mandatory anymore. But still the small display size limits the user experience when browsing the web on these devices. As a result although access to the full web is reasonably well working a tendency to providing additional versions of mobile optimized versions of websites can be observed. This paper presents a multidimensional study where usage scenarios as well as the usability of mobile tailored compared to full websites were investigated. The results show clearly that users prefer and effectively do benefit from mobile optimized versions. However content providers sometimes do not understand the mobile scenarios in which their sites are used and consequently begin optimizing the functionality at the wrong end.

## Categories and Subject Descriptors

D.3.3 [Information Interfaces and Presentation]: User Interfaces - *evaluation/methodology*

H5.2 [Information systems]: Information interfaces and presentation - *User Interfaces*

## General Terms

Measurement, Performance, Design, Human Factors

## Keywords

Mobile Web, Usability, Usage Scenarios, Survey

## 1. INTRODUCTION

Information services targeted the mobile phone sector since the late 90ies. While NTT Docomo started its proprietary i-mode service 1999 in Japan [3], in Europe, the Wireless Application Protocol (WAP), a standardized alternative for mobile phone web access was heavily promoted in 2000, but struggled to fulfill the expectations [8]. Due to the lack of bandwidth and the limited processing power of mobile phones at that time, both technologies did not provide direct access to regular websites but only to a limited set of information especially formatted for the used technology. 2003 several mobile Browsers that could access the full web were already available [2]. However the visualization of the visited web pages with these systems was often quite different compared to desktop web browsers. The latest generation of mobile phones though is promoted especially as full web capable devices. The presented study was conducted to examine the

usability of the mobile web using these devices and to identify realistic usage scenarios. Although previous work exists, the rapid progress in this market sector justifies an additional study. To our knowledge in this field this work is unique in assembling the output of several methods like interviews and usability tests in a single study.

## 2. PREVIOUS RESEARCH

In 2006 Timmins et. al. examined the content of over one-million mobile web pages from around the world and found that WML (the wireless markup language used in WAP services) was the dominant mobile web content type, although regional differences did exist [6]. In [5] Sujan studied the impact of mobile phone limitations by comparing 4 typical web tasks performed on mobile phones as well as on desktop computers. The study showed that up to three quarter of the participants failed in the more complex tasks. In [2] Kaikkonen presented a global online survey that revealed usage patterns of mobile Internet users. The study showed that full web and mobile tailored websites are both used but for slightly different reasons. In Europe and America, where mobile web users were considered early adopters, accessing the full web was more familiar whereas in Asia users preferred mobile tailored operator portals.

## 3. RESEARCH SETUP

The topic of usage and usability of the mobile web can be examined from several perspectives. In this study the approach was to start the investigation with 12 hypotheses that were brought in by graduate student groups. These were then consolidated and reformulated into 5 resulting research questions that could be further investigated using various methods.

### 3.1 Scope and applicability of results

All tasks were performed in Austria and only local people participated in the usability tests. However the EU-commission's yearly telecommunications report 2009 states that due to relatively low cost the mobile internet usage in Austria is currently the highest in the EU [4]. Hence we consider the results of this study as relevant for the further development within Europe.

### 3.2 Research Questions

**Question 1:** "What kind of websites are most often accessed using a mobile phone and who are the users?"

This question was evaluated using a face-to-face survey. Participants were asked about their experience with mobile web browsing, their expectations and their typical usage scenarios. From 109 participants 60% were female and 40% male. Nearly

half of the interviewed users were beyond 20 years old, 32% between 20 and 29.

The typical mobile web user is mostly male, technically interested and/or educated and between 20 and 29. Although they would be quite interested, younger mobile phone users often cannot afford the additional cost for mobile internet. The second top most argument against using the mobile web was stated as being the poor usability even of the latest mobile phone models. Based on a categorization of named websites 70% of the mobile accessed websites provide current (i.e. weather forecast, news, timetables) or general information (i.e. Wikipedia). 17% focus entertainment (Music, Video) and 13% Social Networks (i.e. Facebook)

**Question 2:** *How many of the top most accessed websites from within Austria do have an additional mobile tailored version? How many of the the Top 100 austrian companies do offer a mobile tailored version*

The top most accessed websites where identified using the published Alexa Traffic Rankings [1]. A list of Austria's top 100 companies was provided by the economics magazine "Trend" [7]. For all sites and companies a mobile version was searched by a) accessing the normal version with several mobile phones (automatic detection), b) searching with Google and c) by searching the homepage for a link to a mobile tailored version.

While 82% of the Top50 accessed sites do at least have one mobile version (some have several version for iPhone, WAP,...) this percentage is lowered to 34% for the next 50 Sites. Only 6 out of Austrians Top100 companies have a mobile version. An interesting side result in this task was that not a single .mobi-Domain was found.

**Question 3:** *What websites are currently available in a mobile tailored version? Should mobile tailored version provide the same information as the full version or is a limited set of functionality an advantage?*

For this task the mobile tailored sites found in task 2 were categorized and the results compared to the sites named in task 1. 55% of the found mobile versions fell in the category "Information Services" – 1/10 of those were directly related to tourism information. Only 7% were clearly "Entertainment" and 20% "Social Networking" sites. The remaining 18% consisted of several search engines, online shop systems and other sites that did not fit in the categorization scheme in task 1.

**Question 4:** *Do the mobile optimized versions really have an advantage in comparison with the full version when viewed on a mobile phone?*

For the evaluation of this question 5 sites (ebay, amazon, facebook, herold (yellow pages), Xing) with separate mobile versions were evaluated in a usability test. 3-4 typical tasks for each site were performed by 9 moderately experienced users, first on the full version, then on the mobile tailored version. This evaluation was carried out on controlled laboratory environment to minimize the impact of possible distraction and recorded for a subsequent analysis. Although several different phones were used each pair (full & tailored version) was always tested with the same device.

On those tasks that could be achieved with both versions the users were 30-40% faster using the mobile tailored version. Although that can be expected from a version being specifically optimized for a certain device all testers stated that the feature limitations of the tailored versions were annoying even though they had to concede that some of the more complex tasks (i.e. setting up a

new account for eBay) are probably unlikely to be performed on a mobile phone.

**Question 5:** *Which type of mobile phone qualifies best for surfing the web (full version)?*

This question was evaluated by conducting a second set of usability tests using 4 different types of phones:

- Pen-oriented touch screen device (HTC Touch Diamond)
- No touch screen, only normal T9 keyboard (Nokia N96)
- touch screen only device (Apple iPhone)
- Touch screen, QWERTY hardware keyboard (T-Mobile G1)

Generally all testers preferred touch screen devices though an additional keyboard – even a small T9-keyboard – was considered highly convenient. Using a pen for navigational purposes and keyboard entry was turned down flat by all users. To our surprise the mean time for completing the tasks did not identify a clear winner but devices equipped with hardware keyboard showed significant advantages in data entry intensive tasks.

## 4. CONCLUSION AND FUTURE WORK

Although the latest generation of mobile phones are reasonable suited to browse the full web, mobile tailored versions are still preferred by most users. However these mobile versions do not depend on specialized protocols and formatting languages anymore. The rising supply of web-capable devices combined with falling prices for data connections will presumably further increase the demand for a new generation of mobile tailored websites. Future work should examine technical and economical questions that emerge from this additional entry point to the information highway.

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