Chapter XIX
Adapting Web Sites for Mobile Devices – A Comparison of Different Approaches

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ABSTRACT

With the rise of mobile devices like cell phones and personal digital assistants (PDAs) in the last years, the demand for specialized mobile solutions grows. One key application for mobile devices is the Web service. Currently, almost all Web sites are designed for stationary computers and cannot be shown directly on mobile devices because of their limitations. These include a smaller display size, delicate data input facilities and smaller bandwidth compared to stationary devices. To overcome the problems and enable Web sites also for mobile devices, a number of different approaches exist which can be divided into client and server based solutions. Client based solutions include all attempts to improve the mobile device, for example by supporting zoom facilities or enhance the data input. Server based solutions try to adapt the pages for mobile devices. This chapter concentrates on server-based solutions by comparing different ways to adapt Web sites for mobile devices. It is assumed that Web sites designed for stationary devices already exist. Additionally, it concentrates on the generation of HTML pages. Other languages, designed especially for mobile devices like WML or cHTML, are not taken into account simply because of the improvement of mobile devices to show standard HTML pages. The following three methods are generally used today: Rewrite the page, use an automatic generator to create the page, or try to use the same page for stationary and mobile devices. This chapter illustrates each method by adapting one page of the electronic shop software eSarine. Afterwards, the methods are compared using different parameters like the complexity of the approach or the ease of integration in existing systems.

INTRODUCTION

Mobile devices have become more and more popular in the last years. The most popular device is the cell phone. The Forrester (2003) statistic shows that 71% of all Europeans owned a cell phone in 2003. Other mobile devices are personal digital assistants (PDAs), mostly used to organize address books and calendars, or to write down short notes. Interesting developments are smart phones. A smart phone is a mobile device with PDA, as well as cell phone functionalities. On the one hand, there exists cell phones with PDA functionalities, on the other hand, there are PDAs, which can be used as a cell phone. With the starting of faster network solutions like UMTS new applications will become possible. One application is the use of the Internet Web service to access Web sites.

However, mobile devices have some disadvantages compared to stationary computers. These are:

- **Small display size:** The display size of mobile devices vary from small cell phones 96×65 pixel or less to 320×480 pixel on foldable smart phones. Even these displays are small compared to typical stand alone computer sizes with up to 1280×1024 pixel
- **Delicate data input:** On mobile devices, data input is done mainly with a small keyboard or by using a touch screen. Both ways are not as convenient as input on standalone systems using a keyboard and mouse
- **Small bandwidth:** Today's mobile networks offer a small bandwidth. Users find often no more than 9600 bits per second where a 50 Kbytes Web site needs more than 40 seconds to load
- **Lower memory size:** Mobile devices have a RAM size of 16 to 64 MB whereas stationary computers come with 512 MB equipped

These disadvantages have a large impact on mobile Internet usage. Therefore, it is problematic to use the same solutions, in this case Web sites, for stationary and mobile devices. The Web sites should be adapted in order to be usable on a mobile device.

Web site adaptation can be done on the client or on the server. In the first case, the (non-adapted) page is sent to the client and adapted there. This can be done by extending the navigation facilities of the client. Typical solutions usually work with zoom capabilities (Bederson & Hollan, 2003) or reordering to show one part of a site. These solutions can also be found in most Web browsers designed for mobile devices today. However, the problem of scrolling through the site remains. Additionally, the bandwidth problem cannot be solved using this approach because the non-adapted page is sent completely to the client. Therefore, this chapter concentrates on the server site adaptation which is usually done by the Web administrator of the pages.

The remainder has the following structure: The next section gives some background information for adapting Web pages. Afterwards, the adaptation scenario is presented which shows the Web shop eSarine and the test environment. The following section shows the three adaptation solutions that were used for this test. In the comparison part, all three solutions are compared and some guidance is given. The Conclusion finishes the chapter and takes a look at future work.

BACKGROUND

When adapting pages both for mobile and stationary devices, the solution must fulfil the following two steps: