

## Chapter LIII

# Customizable Viewlets: A Generic Approach for the Mobile Web

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### ABSTRACT

*In the last years, mobile devices have become more and more popular. To further enhance the success of mobile devices, companies in the mobile market are constantly looking for new possible applications. One application with a high potential is the mobile Web. Mobile Web means that people access Web sites using their mobile device. However, due to the limitations of the mobile device compared to stationary devices, mobile Web sites need to be adapted. This chapter presents an approach for creating Web solutions that can be used on all kinds of devices. The main idea is adapted from Web portals, where users can customize their personal sites by choosing different viewlets that present all kinds of content. The approach has been tested using the online shop eSarine.*

### INTRODUCTION

Mobile devices such as PDAs and cell phones have become more and more popular in the last years. Currently, a cell phone is used mostly for making phone calls and sending short messages. With the starting of faster network solutions such as UMTS and the development of more powerful devices, 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, including:

- **Small display size.** The display size of mobile devices varies from small cell phones with 96×65 pixels or less to 320×480 pixels on foldable smart phones. Even these displays are small compared to typical stand-alone computer sizes with up to 1280×1024 pixels.

- **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 stand-alone systems using a keyboard and a mouse.
- **Small bandwidth.** Today's mobile networks offer a small bandwidth. Users often find 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.

Because of these limitations, mobile devices have problems when showing today's Web pages directly. For this reason, a page adaptation for the mobile device is a good idea. Web site adaptation can be done on the client or on the server. In the first case, the (nonadapted) page is sent to the client and adapted there. Typical solutions usually try to improve the navigation by adding zoom capabilities (Bederson & Hollan, 1994) or reordering some parts of the site. These solutions can also be found in most Web browsers designed for mobile devices today. However, these solutions are somewhat limited because often not the correct adaptation is done. Additionally, the bandwidth problem cannot be solved using this approach because the nonadapted page is sent completely to the client. Therefore, this chapter concentrates on server site adaptations, typically done by the Web administrator who is also responsible for the correct presentation on stationary devices.

The remainder has the following structure: The next section gives some background information for adapting Web pages. Afterwards, an adaptation method based on viewlets is presented.

This approach has been tested using the online shop eSarine (Werro, Stormer, Frauchiger & Meier, 2004). Recommending viewlets to Web page users is an interesting add-on that will be presented in the second part of this chapter. The conclusion finishes the chapter and takes a look at future work.

## BACKGROUND: MOBILE WEB

The adaptation of Web pages has become a major research area, and a number of different solutions exist. When adapting pages both for mobile and stationary devices, the solution must fulfill the following two steps:

1. Identify if the client is a mobile or stationary device.
2. Eventually generate the adapted pages; afterwards, send the page to the device.

For both problems, different approaches (or combinations) already exist. In step one, the Web server has to determine if the client is a mobile device and needs the adapted page or not. For this problem, a number of approaches exist:

- **Use a different domain name/URL.** This is a simple solution that returns the problem to the user of the page. The nonadapted pages are returned when a default URL is requested (e.g., [www.google.com](http://www.google.com)), and the adapted pages are sent when a different URL is requested (e.g., [www.google.com/pda](http://www.google.com/pda)). The major problem of this approach is that the user has to know that there are specialized pages. This can be achieved by adding a special entry page where the user can choose the URL.
- **Use a client cookie.** The solution of cookie setting is usually implemented together with the customization approach (see following description of adaptation solutions). The user

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