An Introduction to WAP

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The Wireless Application Protocol is a group of standards for developing Internet-based applications and services that use wireless networks. The term 'WAP' is also loosely used to refer to Internet access and browsing on a mobile phone. The WAP Forum, a consortium of phone and software makers, realized a common standard was more likely to be adopted by the public than their proprietary systems.

The Wireless System

There are many elements in the wireless system, as well as many different options for each element. The WAP protocol specifies how these elements work together.

The Device

The most common devices using WAP are cellular phones, though handheld computers with wireless connections are another possibility. Not all cell phones are WAP phones, those that can are often advertised as being "wireless web enabled".

The Browser

Often called a "microBrowser", this is a software program stored on the mobile phone that loads WAP sites, lays them out on the screen and enables you to navigate them. In Europe, the browser is typically created by the phone manufacturer, while currently in the US phones use a browser by Phone.com. This is significant as the browsers display WAP sites differently. WAP developers need to test their sites on several phone displays.

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> **WAP sites must focus on quick responses and timely information.**

The Network

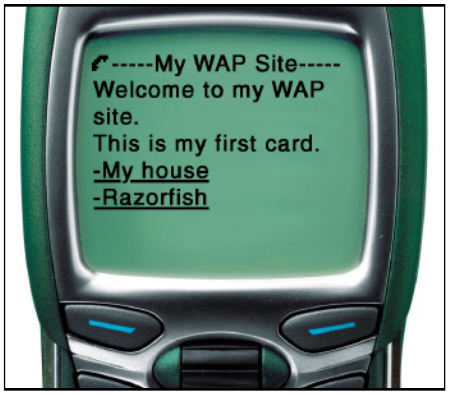
There are different standards for mobile phone communication, which is why one's mobile phone will often not work in other countries (There are "multi-band" phones that can use multiple standards). Europe uses the GSM standard, allowing phones to connect to different providers anywhere on the continent. The competing standards has slowed mobile phone development in the United States, CDMA (SprintPCS, Verison) , TDMA/CDPD (AT&T), and GSM (Voicestream, PacBell). All of the standards offer download speeds much slower than a home modem. The much-hyped, but still-awaited 3G (Third Generation) networks promise much faster data downloads, allowing color images and multimedia, but will not likely be seen before 2003. An intermediary standard, GPRS offers faster downloads and are always connected.

The Gateway

The WAP gateway is a server typically maintained by the mobile phone company, which receives and formats data between the phone and the Internet. It can be likened to an Internet Service Provider as it provides connectivity to the Internet and handles account information.

The Server

WAP requests go from the phone, through the gateway, over the internet, to a WAP Server, similar to a Web server. In many cases a phone company will run its own gateway and server, without allowing access to the Internet.



WAP phone displaying the WAP example.

WAP Cards

Instead of web pages, WAP sites are composed of 'cards', typically holding a screen or two of content. In addition to text, they can have links to other cards and display images. Related cards are stored in one file, called a 'deck' which is loaded and cached by the phone.

The Language

The smaller screen size and slow connection of a WAP phone require

that the information it receives be written and formatted differently. Preceded by the Handheld Device Markup Language (HDML), the more consistent Wireless Markup Language (WML), based on the eXtensible Markup Language (XML) specification, has become the standard for WAP phones, though many also display HDML. Wireless Markup Language (WML), a fairly simple language designed to put small amounts of text on the screen with little formatting.

A WML Deck Example

```
<?xml version="1.0"?>
<wml>
<card id="1" title="My WAP Site">
<p>Welcome to my WAP site<br/>
This is my first page.<br/>
<a href="#card2">My house</a><br/>
<a href="http://wap.razorfish.fi">
Razorfish</a></p>
</card>
<card id="card2" title="My house">
<p><img src="house.wbmp" alt="My
house"/></p>
<p>This is my house!<br/></p>
</card>
</wml>
```

WML functionality

Simplicity is key. WML gives very limited control over card layout, as the expected screen size is quite small, (typically 20 characters wide and 8 lines tall) and the display varies by the phone manufacturer. The user can only scroll up and down the column, as text always wraps to the next line at the edge of the screen. Text can be bolded, but there is no font control. Web form elements are included, allowing for password entry and search fields. 1-bit (black and white) images can be loaded onto a WML card, but slow downloads makes this unpopular.

NTT DoCoMo's I-mode

A parallel to WAP is I-mode, a very popular Japanese service run by NTT DoCoMo (the dominant mobile phone operator). It has some social and technical advantages over WAP. Its data service is continuously connected, and nicely integrated into the phone handset, so Internet connections happen quickly and easily. It has slightly faster download speeds, and many phones can show more graphics and play sounds. NTT's near monopoly of the phone system allows it to control transactions, allowing people to buy things over I-mode. Another cause of its success in Japan may be relative scarcity of personal computers, making I-mode many people's first Internet experience. Though I-mode is being prepared for rollout in the US and Europe, it is unlikely to have the same effect in a multi-provider, Web-savvy market.

The User Experience

The WAP user generally enters through a portal, or list of links created by the phone company and often cannot easily go to an outside WAP site. These WAP portals may be promoted under a proprietary name, with the user unaware that the same content is available on other services. WAP services often buy "space" on the portal, sometimes offering identical functionality. In general, the portals offer almost no customization, or editorial control. A WAP site not listed on the portal's menu can be typed in by hand using the numeric keypad, a laborious, but achievable task. In short, the user experience of getting to a WAP site can be difficult.

Design Strategies

There has been a tremendous amount of hype regarding wireless devices over the past year, and not surprisingly, much of it has failed to develop. A Forrester report accuses WAP site makers of creating "brochure-ware" sites without utility to the visitors, the same mistake made in the early Web days.

WAP sites are best utilized for quick hits of information, including sports scores, flight information, movie times. Potential and actual users should be identified and interviewed. WAP sites must be continuously tested and revised to keep it optimized. The number of WAP phones continues to grow rapidly, but users are failing to use the WAP service. The audience for a WAP product is potentially huge, but it must convince them to use it.

for more information

The WAP forum (has WML spec)
www.wapforum.org

A WAP emulator
www.wapjag.de

A good site for WAP information
www.wap.com

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