

From pages to applications: Mobile Web Best Practices

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ABSTRACT

Within the World Wide Web Consortium (W3C), the Mobile Web Initiative (MWI) was created in 2005 to help make browsing the Web from mobile devices a reality.

This paper presents an overview of the Mobile Web Best Practices [1] [2] developed within the MWI to improve the mobile-browsing user experience on as many mobile devices as possible.

Keywords

mobile browsing, standards, standardization, best practices, conformance, mobileOK, mobile web applications

INTRODUCTION

More than 3 billions of mobile phones are in use today, more than cars, more than PCs, more than TV sets [3]. Most of the mobile phones include some form of browsing capability. Usage is low, but the Mobile Web is a reality, and the de facto platform of choice for applications: easy to develop, easy to maintain, easy to deploy, widely supported.

Mobile Web Applications derive from Mobile Web sites made of Mobile Web pages. To create a rich user experience, Mobile Web pages need to rely on *solid foundations* so that it's easier to build on top of them.

The Mobile Web Best Practices 1.0 document [1], produced by the W3C MWI Best Practices Working Group (BPWG) [4], defines key guidelines to follow to provide an appropriate user experience on mobile devices. Based on a restricted set of the above guidelines, the *mobileOK* trustmark makes it easy for content providers to address mobile specificities when building web sites. Testing whether a page is *mobileOK* simply is a matter of running a *mobileOK* checker [4] on the page.

The Mobile Web Application Best Practices document [2] follows in the footsteps of the former one to enhance the user experience in the context of Mobile Web Applications, taking advantage of the capabilities of each device.

THE WEB: THE DE FACTO MOBILE PLATFORM

Development in the so-called desktop world always targets a restricted set of operating systems. While interoperability problems exist, they are relatively easy to address.

The mobile world introduced so many different devices that trying to fix fragmentation issues for a given native application is nearly impossible to achieve for content providers. Native applications are hard to develop and need to come in completely different flavors to target more devices.

Java applications are easier to develop, but code signing is both mandatory for a good user experience who would otherwise always be prompted for messages such as: "This application wants to access the Web", and impractical as different actors are at stake: the operator and/or the manufacturer.

Web applications on the other hand are easy to develop, easy to maintain since the code is server-side, easy to install, and although fragmentation exists in browsers implementations, make it easy to address the vast majority of mobile devices with limited resources and time. One current caveat is that access to the device functionalities (e.g. camera, contact list, GPS) cannot be done from the browser. This is being addressed, for instance by the work of the W3C Ubiquitous Web Applications Working Group on the Delivery Context: Client Interfaces 1.0 document (DCCI) [5]. Work on geolocation is about to start within W3C as well.

BEST PRACTICES FOR MOBILE WEB PAGES

Why Best Practices

How do you know that a given Web page provides a *satisfactory* user experience on most mobile devices? Testing on thousands of devices is long, hard, and expensive. Many users simply do not use their mobile phone for browsing because they had a very unsatisfactory first experience with it. Following guidelines while developing content is a mandatory start in order to bring the need for testing back to a reasonable level.

Why W3C Best Practices

The Mobile Web Best Practices were elaborated based on existing sets of best practices (e.g. from Opera [6], OpenWave [7], Nokia [8], Little Spring Design [9]). The specificities of mobile devices are at the heart of these best practices: limited display, lack of usable keyboard, limited memory, network latency, cost, lack of support for scripting and plug-ins, but also the fact that the user goals on mobile are different from a desktop browsing

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experience, and the advantages that mobile devices introduce in terms of connectivity and personalization.

The document went through the W3C Recommendation track process, which means it received wide review and support during its various stages of maturity, both from professionals and from the community at large. The BPWG believes the result is a carefully selected and essential set of best practices that, when followed, create a *satisfactory* user experience on most mobile phones.

Best Practices and User Experience

The Best Practices may be divided into 10 directions to follow to address the user experience when developing mobile content. They are listed below, with, for each of them, details on the best practice that has the most important and direct impact on the user experience.

Note that the limitations of mobile devices share many similarities with people with disabilities [10]. Some of the best practices detailed below (STYLE_SHEETS_USE, POP_UPS, PROVIDE_DEFAULTS) directly map to the Web Content Accessibility Guidelines.

A convenient summary of the Best Practices that matches the following division is available as handy flipcards for developers [11]

Design for One Web

CAPABILITIES: Exploit device capabilities to provide an enhanced user experience.

The “One Web” vision the W3C promotes sometimes is considered to be synonym to delivering the same content regardless of the device. It is actually about delivering the same information and services to all devices, as far as is reasonable, but the user experience should be addressed differently on different devices, and enhanced when possible.

Rely on Web standards

STYLE_SHEETS_USE: Use style sheets to control layout and presentation, unless the device is known not to support them.

Mixing content and style may work well on a given device, but means the presentation will not degrade gracefully when the content is displayed on a more limited device, resulting in an extremely poor user experience in that case.

Stay away from known hazards

POP_UPS: Do not cause pop ups or other windows to appear and do not change the current window without informing the user.

On a small display, a pop up window can but take a large portion of the screen (when pop up windows are supported, that is). This would confuse the user.

Be cautious of device limitations

COOKIES: Do not rely on cookies being available

Cookies in the mobile world are not as widely and uniformly supported as in the desktop world. If cookies are

used to carry some user preferences for instance, lack of support for cookies means the user has to enter his preferences over and over again.

Optimize navigation

NAVBAR: Provide only minimal navigation at the top of the page

Most desktop web pages include some kind of top-left navigation system. Once converted to a narrow vertical layout for mobile browsing, navigation links end up at the top of the page. The user has to scroll down the links in search of the real content of the page. Whenever possible, the navigation links at the top of the page should be kept to a minimum. A possible solution is to provide one link at the top of the page that references navigation links at the bottom of the page.

Check graphics and colors

COLOR_CONTRAST: Ensure that foreground and background color combinations provide sufficient contrast.

Think about the user browsing the web outside under the sun. Such lighting conditions require contrast to be maximized. Mobile devices are being carried and used in many different places.

Keep it small

SCROLLING: Limit scrolling to one direction, unless secondary scrolling cannot be avoided

Using keys, scrolling in one direction may already lead to an unsatisfactory user experience. Scrolling in two directions is both confusing for the user, who would easily get lost on the page, and a tedious process without a mouse.

Use the network sparingly

CACHING: Provide caching information in HTTP responses

Ensuring that caching information is present through the use of Cache-Control HTTP headers for instance is a rather technical topic, but has direct consequences in terms of user experience on a high latency and low bandwidth network: the ability for the browser to cache resources that will be re-used throughout a given web site (e.g. images, style sheets). It dramatically speeds up page rendering, from tens of seconds down to a few seconds.

Help and guide user input

PROVIDE_DEFAULTS: Provide pre-selected default values where possible.

Without any practical mouse and keyboard, the user need to enter information should be kept to a minimum. Whenever possible, remember what the user previously selected, and select that choice by default to shorten the time it takes for the user to complete the form.

Think of users on the go

CENTRAL_MEANING: Ensure that material that is central to the meaning of the page precedes material that is not.

Users on the go are easily distracted and cannot spend too much time browsing content. They need compact information. Decorative images, advertising, and other materials that may appear before the actual content of the page should be avoided.

Checking Best Practices: the mobileOK trustmark

Keeping Best Practices in mind is a tedious task. Checking that all Best Practices were fulfilled is as well. To help developers create mobile content, the Best Practices that may be automatically checked were extracted from the document and put together under a *mobileOK* trustmark. While this trustmark cannot by definition include all of the Best Practices, it still captures a consistent set of Best Practices.

The reason behind the choice to limit the trustmark to the Best Practices that may be automatically checked is that determining whether a page is *mobileOK* or not becomes simply a matter of running a *mobileOK* Checker on the page.

A few implementations of *mobileOK* checkers already exist. The BPWG developed one of them [4] as an open source project in Java.

Developing *mobileOK* pages does not ensure that the user will be given the best possible user experience, but ensures it will not be too bad. Again, it is a mandatory *start* to address the user experience.

BEST PRACTICES FOR MOBILE WEB APPLICATIONS

Once a page is *mobileOK*, one may focus on improving the user experience on specific classes of devices.

The BPWG is currently working on a sequel to the Mobile Web Best Practices document, focused on creating Mobile Web Applications. It is still work in progress.

The CAPABILITIES Best Practice presented above is at the heart of this new document. How one may take advantage of the new user interaction methods that some devices introduce (e.g. touch screen, location-based awareness) to improve the usability and responsiveness of pages?

The document currently explores the following areas:

- *Personalization*: practical means to keep user information and stop asking for credentials to be entered repeatedly.
- *Security and privacy*: the use of HTTPS has a real overhead cost in mobile networks. It is sometimes not necessary to use HTTPS.
- *User awareness and control*: users should know when a page accesses the network in the background since they may be charged by their network provider based on the amount of data exchanged with servers.

- *Client side storage*: introduced in HTML5, this is particularly relevant to the mobile world where having to go through the server, even through AJAX techniques, takes too much time, and limits the possibilities of an application in terms of fluidity.
- *Conservative use of resources*: transfer compression can save precious seconds.
- *User interaction and interface issues*: touch screen devices are increasingly common, and focus based interaction is different from pointer based interaction. On the user interface part, if your page is updated in the background, techniques such as the Yellow Fade Technique [12] could help the user detect the change.
- *Handling device capability variation*: it is impossible for a content provider to create the best possible user experience on all and every mobile devices. Using classification and Device Description Repositories [13] may help.

RELATED WORKS WITHIN W3C

There are many different works somehow related to the mobile world and the improvement of user experience on mobile devices. Here is a non exhaustive overview:

- Content Transformation Guidelines [14] to address the issues raised by the use of adaptive engines between content providers and end users
- From Mobile Web Best Practices (MWBP) to Web Content Accessibility Guidelines (WCAG), and from WCAG to MWBP: how to do address both mobility and accessibility [10]
- Device Description Repository Core Vocabulary and Simple API [13] to enable the inter interoperability of different device description databases
- Test suites targeted at mobile browsers [15] to check implementations of various standards in mobile browsers
- Mobile Web in Developing Countries [16] where mobile devices often are the *only way* to access the Web.
- Scalable Vector Graphics (SVG) and Web Integration Compound Document [17] to enable rich User Interfaces on mobile devices.
- The Web Security Context Working Group [18] is working on a baseline set of security context information that should be accessible to Web users

W3C MEMBER SUPPORT

The W3C is an industry consortium comprised of member organizations. The work of the Best Practices Working Group is driven by the member organizations that choose to participate in the work of the group.

REFERENCES

- 1.W3C Proposed Recommendation, Mobile Web Best Practices 1.0: <http://www.w3.org/TR/mobile-bp/>
- 2.W3C Working draft, Mobile Web Best Practices 2.0: <http://www.w3.org/2005/MWI/BPWG/Group/Drafts/BestPractices-2.0/latest>
- 3.Tomi Ahonen, Putting 2.7 billion in context: Mobile phone users: http://communities-dominate.blogs.com/brands/2007/01/putting_27_bill.html
- 4.W3C mobileOK checker: <http://validator.w3.org/mobile/>
- 5.W3C Candidate Recommendation, Delivery Context: Client Interfaces 1.0: <http://www.w3.org/TR/DPF/>
- 6.Opera's Making Small Devices Look Great <http://my.opera.com/community/dev/device/>
- 7.OpenWave Best Practices in XHTML Design: http://developer.openwave.com/dvl/support/documentation/guides_and_references/best_practices_in_xhtml_design/index.htm
- 8.Nokia Guidelines for XHTML-MP on Series 60: http://sw.nokia.com/id/4f7b6805-47d7-4914-885c-6ef2b487adf6/Series_60_Platform_Designing_XHTML_MP_Content_v1_4_en.pdf
- 9.Little Spring Design style guides: <http://www.littlespringsdesign.com/design/styleguides.html>
- 10.W3C Working Draft, Relationship Between Mobile Web Best Practices 1.0 and Web Content Accessibility Guidelines: <http://www.w3.org/TR/mwbp-wcag/>
- 11.Mobile Web Best Practices flipcards: http://www.w3.org/2007/02/mwbp_flip_cards.pdf
- 12.37signals' Yellow Fade Technique: <http://www.37signals.com/svn/archives/000558.php>
- 13.W3C Working Draft, Device Description Repository Simple API: <http://www.w3.org/TR/DDR-Simple-API/>
- 14.W3C Working Draft, Content Transformation Guidelines 1.0: <http://www.w3.org/TR/ct-guidelines>
- 15.W3C Mobile Web Initiative Test Suites Working Group: <http://www.w3.org/2005/MWI/Tests/>
- 16.W3C Mobile Web in Developing Countries: http://www.w3.org/2008/02/MS4D_WS/
- 17.W3C Compound Document Formats Working Group: <http://www.w3.org/2004/CDF/>
- 18.W3C Web Security Context Working Group: <http://www.w3.org/2006/WSC/>