The Mobile Web
(or the masochist's guide to gleeful self-flagellation)

Peter-Paul Koch (ppk)
http://quirksmode.org
http://twitter.com/ppk
Full Frontal, 20 November 2009
The Mobile Web

Mobile is the single most fascinating development on the Web in many years.

Problem is: we don't have the faintest idea what to do with it.

Yet.
Mobile browsers

- Android WebKit
- Opera Mobile
- NetFront
- Safari
- MicroB
- Blackberry
- S60 WebKit
- IE Mobile
- Palm WebKit

- Iris
- Bolt
- Skyfire
- Obigo
- Fennec
- Teashark
- Ozone
- Opera Mini

You may groan now.
Mobile browsers

- Android WebKit
- Opera Mobile
- NetFront
- Safari
- MicroB
- Blackberry
- S60 WebKit
- IE Mobile
- Palm WebKit

Default browsers

- Iris
- Bolt
- Skyfire
- Obigo
- Fennec
- Teashark
- Ozone
- Opera Mini

Non-default
Mobile browsers

- Android WebKit
- Opera Mobile
- NetFront
- Safari
- MicroB
- Blackberry
- S60 WebKit
- IE Mobile
- Palm

These are all WebKit browsers.
WebKit Mobile

There is no WebKit on Mobile.

There's iPhone Safari (2 and 3),
and Android (1.0 and 1.5)
and S60 WebKit (v3 and v5)
and Iris, which was bought by Blackberry
and Palm
and Bolt, Ozone, Teashark, and a few more

These WebKits are all different.
There is no WebKit on Mobile.

Exhibit A: http://quirksmode.org/m

<table>
<thead>
<tr>
<th>Browser</th>
<th>S60v3</th>
<th>S60v5</th>
<th>iPhone 2.2</th>
<th>iPhone 3.1</th>
<th>Android 1.0</th>
<th>Android 1.5/1.6</th>
<th>Bolt 1.5</th>
<th>Iris 1.1.9</th>
<th>Ozone 0.9</th>
<th>Palm Pre 1.2.1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Behavior</td>
<td>buggy</td>
<td>no</td>
<td>static</td>
<td>yes</td>
<td>yes</td>
<td>static</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The original element when another element is placed after it.

<table>
<thead>
<tr>
<th>Browser</th>
<th>S60v3</th>
<th>S60v5</th>
<th>iPhone 2.2</th>
<th>iPhone 3.1</th>
<th>Android 1.0</th>
<th>Android 1.5/1.6</th>
<th>Bolt 1.5</th>
<th>Iris 1.1.9</th>
<th>Ozone 0.9</th>
<th>Palm Pre 1.2.1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Behavior</td>
<td>yes</td>
<td>incorrect</td>
<td>incomplete</td>
<td>incorrect</td>
<td>incorrect</td>
<td>incomplete</td>
<td>yes</td>
<td>incorrect</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Behaves as if it has absolute while scrolling. After scrolling has finished it’s placed at the

<table>
<thead>
<tr>
<th>Browser</th>
<th>S60v3</th>
<th>S60v5</th>
<th>iPhone 2.2</th>
<th>iPhone 3.1</th>
<th>Android 1.0</th>
<th>Android 1.5/1.6</th>
<th>Bolt 1.5</th>
<th>Iris 1.1.9</th>
<th>Ozone 0.9</th>
<th>Palm Pre 1.2.1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Behavior</td>
<td>no</td>
<td>static</td>
<td>to be tested</td>
<td>yes</td>
<td>static</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Mobile browsers

The main battle on mobile is now between “WebKit” and Opera.

WebKit is free, but that means everybody creates his own version.

Opera costs money (for vendors), but there's some central planning, and therefore less differences.
Mobile browsers

- Blackberry browser is dead; they'll switch to WebKit instead
- Mozilla is very late to the game
- NetFront is not very good
- IE ... is IE (IE6, to be precise)
- The minor browsers are even worse
QuirksMode.org is the prime source for browser compatibility information on the Internet. It is maintained by Peter-Paul Koch, freelance front-end consultant, agent, and trainer in Amsterdam, the Netherlands.

QuirksMode.org is the home of the Browser Compatibility Tables, where you'll find hype-free assessments of the major browsers' CSS and JavaScript capabilities, as well as their adherence to the W3C standards.
Safari iPhone 2.2
Zooms out and shows entire page.
Width about 900px
Blackberry 9500 (Storm)

Same, but with a few bugs.
S60v3 WebKit on Nokia E71
NetFront 3.2 on Samsung F700 landscape
NetFront 3.2 on Samsung F700 portrait

Yeah ... right ...

This is a mobile mode. Site is squeezed into display.
Opera Mobile 9.5 on HTC Touch Diamond (Win Mob 6.1)

Footer not visible; otherwise OK.
Opera Mobile 9.5 on HTC Touch Diamond (Win Mob 6.1) in *mobile mode*.

Totally different.
Opera Mobile 9.5 on HTC Touch Diamond (Win Mob 6.1) in desktop mode.

Basic CSS.
Basic font CSS - mobile

I want to be sure mobile browsers support this CSS because I often use it in my test cases.

**font-weight: 700**

*font-style: italic*

According to JavaScript the fontStyle of the previous line is italic

**text-decoration: underline**

**TEXT-TRANSFORM: UPPERCASE**

**font-variant: small-caps**

**color: blue**

**letter-spacing: 0.3em**

**word-spacing: 1em**

**font-size: 150%**

---

Opera Mobile 9.5 on HTC Touch Diamond (Win Mob 6.1) in *mobile mode*.

Basic CSS.
Android 1.5 landscape mode

quirksmode.org: CSS2 - Box model tweaking

- Traditional box model width
- W3C box model width
- Mozilla's padding-box

- -webkit-box-sizing: content-box
- -webkit-box-sizing: border-box
- -webkit-box-sizing: padding-box
Android 1.5 portrait, in mobile mode.

The 300px wide box is smaller than the 330px wide box.
div.sidebar {
    width: 300px;
    float: right;
}

@media all and (max-width: 400px) {
    div.sidebar {
        width: auto;
        float: none;
    }
}

}
Media queries

- max-width and min-width
- max-device-width and min-device-width
- orientation (portrait or landscape)
- aspect-ratio
  (2/3, 3/4, 4/5, 3/5, 10/16, 80/99)
- dpi (96 for desktop)
  Phones may have up to 200
Media queries

body {  
   font-size: 0.8em;
}

@media all and  
   (min-resolution: 150dpi) {  
      body{
         font-size: 2em;
      }
   }
}
JavaScript

The good news:
- Modern mobile browsers support JavaScript.
- Their compatibility with the various standards is ... decent (in general)
JavaScript

The bad news:
- Performance is still a huge problem.
- Partly caused by small memory.
- Partly caused by lousy implementations.
JavaScript performance

Generate 250 lists with 20 list items each and add them to the document. How long does this take? Significant differences.
JavaScript peformance

<table>
<thead>
<tr>
<th>Device</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>IE Mobile</td>
<td>500</td>
</tr>
<tr>
<td>Blackberry</td>
<td>500</td>
</tr>
<tr>
<td>NetFront SE</td>
<td>97.3</td>
</tr>
<tr>
<td>iPhone 2.2</td>
<td>14.3</td>
</tr>
<tr>
<td>Opera 9.7 WinMob 6.5</td>
<td>12.3</td>
</tr>
<tr>
<td>Android 1.5</td>
<td>7.2</td>
</tr>
<tr>
<td>Fennec b5</td>
<td>6.2</td>
</tr>
</tbody>
</table>
JavaScript performance

iPhone 2.2 14.3
Opera 9.7 WinMob 6.5 12.3
iPhone 3.1 11.1
Android 1.5 7.2
Fennec b5 N900 6.2
S60v3 E71 6.2
S60v5 N97 5
Opera 10 N97 3.6
Opera 9.6 Samsung H1 2.5
JavaScript performance

Don't use iframes!

They're performance hogs.

That's a problem in several test suites. They just don't run on mobile phones.
Connections

If the guy next to you is downloading a few movies your network connection will slow down regardless of how good it's supposed to be.

I don't see this problem disappearing any time soon.
Connections

Besides, connections can suddenly and inexplicably disappear.

online/offline events

Currently implemented wrongly (except by Firefox.)
Connections

Even if they work, connections are a problem on the mobile web, especially when your site uses 200K of custom JavaScript plus a few libraries.

These assets have to be downloaded every time the user visits your site and caching isn't always reliable.
Connections

Solution:
Put the core files on your mobile phone so that you only need to download the data. Saves a lot of network traffic.

Apps do that. Websites don't.

Enter W3C Widgets.
W3C Widgets

W3C Widgets are local applications written in HTML, CSS, and JavaScript. They run in a browser (mainly Opera right now).

They can do Ajax requests for more data.
Creating W3C Widgets

- Create 1 HTML page with the CSS, JavaScript, and images you need.
- Add an icon and a config.xml
- Zip the lot
- Change extension to .wgt
- Upload to a widget-capable phone
- It Just Works
W3C Widgets

Besides...

If I have a W3C Widget on my S60 phone and you have a Windows Mobile phone I can send the widget via Bluetooth and It Just Works

(Really; I've done it)
W3C Widgets

Right now W3C Widgets work in:

- S60 phones with Vodafone Widget Manager
- any phone with Opera Mobile 9.51+
- Windows Mobile 6.5 phones (well, almost)
W3C Widgets

In the future they might work in:

- Blackberry (first steps taken)
- Nokia Maemo?
- Palm Pre? (logical extension of webOS)
- Android??

Not on the iPhone, though.

#appleisevil
W3C Widgets

Problems with W3C Widgets:
- Animations. JavaScript gets better and better, but animations remain a weak spot relative to other languages
- Access to phone functionality such as geolocation, the address book, the camera, and the file system
Device APIs

Context!

In order to serve the mobile context we need to access phone functionality from W3C Widgets.

Enter JavaScript device APIs

device.phone.call(
device.addressBook.entries['mom'].number)
Device APIs

- JIL (Vodafone, China Mobile)
- W3C Device API Working Group (just started)
- BONDI
- PhoneGap (iPhone, Android, Blackberry); temporary solution
Device API Security

Besides, there's a security problem.

If someone sends me a widget via Bluetooth, how am I going to know it isn't going to steal my address book?

Serious problem. No real solution yet.
W3C Widgets

Still, I believe these problems are solvable.

I believe W3C Widgets are the future of the mobile web.

So let's get to work.
Thank you!

Questions?

http://quirksmode.org
http://twitter.com/ppk