Characteristics of Mobile Web Content

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Background
Mobile vs. Non-Mobile Devices

Non-mobile devices
- Great computation power
- Larger display
- Faster and more reliable internet connection

Mobile devices
- Low computation power
- Smaller display
- Slower internet connection
- Input is a hassle
Motivations

• How is the content of mobile web pages geographically distributed?
• What’s the ratio of images/markup content? Average page size?
• What’s the degree of connectivity on mobile web pages?
• How often are unique schema used?
• How prevalent are advertisements?
WAP

- First Mobile Web protocol originally meant to connect laptops, PDAs and mobile phones
- Very lightweight, uses WML for coding purposes
- WAP 1.0 is connection-oriented
- Notion of WML cards
- Maximum speed of 9.6 Kbps
WAP (cont.)

• WAP 2.0 was introduced 3 years later
• Allowed users to surf web, check email and view images
• Maximum speed of 384 Kbps
• Runs over packet-switched networks
• Still had support for WAP 1.0
C-HTML

- *i-mode* was created in Japan in 1999
- Loosely based on WWW protocols
- Users could e-mail, surf web, exchange images
- Programmed in C-HTML
- Required users to have a special handset
XHTML-MP

- The most recent protocol for mobile web pages
- Extends XHTML by adding features to enhance web experience on mobile devices
- XHTML-MP 1.2 DTD is the current mobile web recommendation
Mobile Content Crawler

- Modified Larbin to create Mobile Content Crawler
- Used diverse sites as a starting point for crawler
- Collected site data and stored in a database
Results
Page Statistics

- WML pages far exceed the number of other pages
- HTML has the most servers with C-HTML having the least
- C-HTML far behind in many areas

<table>
<thead>
<tr>
<th>Type</th>
<th>Num. Pages</th>
<th>Num. Servers</th>
<th>Num. Domains</th>
<th>Avg. Pages/Server</th>
</tr>
</thead>
<tbody>
<tr>
<td>WML</td>
<td>1,055,589</td>
<td>13,672</td>
<td>5,734</td>
<td>77</td>
</tr>
<tr>
<td>XHTML-MP</td>
<td>145,314</td>
<td>842</td>
<td>446</td>
<td>173</td>
</tr>
<tr>
<td>C-HTML</td>
<td>14,206</td>
<td>27</td>
<td>26</td>
<td>526</td>
</tr>
<tr>
<td>HTML</td>
<td>227,462</td>
<td>47,110</td>
<td>38,143</td>
<td>5</td>
</tr>
</tbody>
</table>
Page Size Comparison

- WML had the smallest page size with 2159 bytes
- XHTML-MP had the largest mobile page size with 3018 bytes
- All pages were orders of magnitude less than HTML which comprised of 35490 bytes
Page Size Comparison

[Graphs showing cumulative page sizes and total page sizes for different markup technologies: HTML, XHTML-MP, C-HTML, MHTML.]
Connectivity Comparison

• Significantly fewer links than non-mobile sites
• Design choice? Keep pages concise
• 10% of mobile web pages did have 20+ links
• Mobile web pages had higher link density than HTML web pages
Connectivity Comparison
Image Usage Comparison

• Mobile web pages contain images of very small size
• Not many images per page
• Reasons for this include the need to provide optimal speed/less load time
• Large contrast with HTML
Image Usage Comparison
Other Observations

• Not a large use of WML cards due to lack of performance increase
• 50% of XHTML-MP sites incorporated User Agent Data in routing process
• Only .5% of WML pages did – probably due to legacy support
• Low presence of advertisements
Main Contribution

• Provided general observations of mobile web characteristics
• Enables content providers to provide content that runs at an acceptable rate
• Enables mobile web designers to make better design choices
Questions?