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Mobile Browsing

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Introduction

- A definition of "browser"
  - *"computer program used for accessing sites or information on a network (as the World Wide Web)"* (Merriam-Webster Dictionary & Thesaurus)
  - Mobile browser, microbrowser, minibrowser

- Browser substitutes many software applications
  - Email, video streaming, calendar, offices applications, P2P (?)
- Many software applications substitute browsers
  - RSS readers, widgets/gadgets, "special browsers" (e.g. Nokia Channels), dedicated clients (e.g. Gmail, Flickr)

- → boundaries of browsing not clear

Web technologies in mobile browsers

- Major web technologies supported in mobile browsers
  - HTML 4.01, XHTML MP 1.1, WML 1.3 and 2.0, CSS 1 and 2, JavaScript 1.5, Flash Lite 2.0, AJAX, RSS 2.0, SSL / TLS
- … not very relevant when comparing major mobile browsers
  - All important web technologies supported by the major browsers
  - No long-term competitive advantage from implementing one feature
- Overview layout probably the most visible recent feature

Original layout

Overview layout

Major Mobile Browsers

- **Advanced browsers in high-end handsets**
  - Most advanced browsers currently (April, 2007)
    - Nokia S60 3rd edition browser (Nov 2005)
    - Opera Mobile version 9 (Feb 2007)
    - Safari for Apple iPhone (Jan 2007)
    - Pocket Internet Explorer "Deepfish" (Mar 2007)
    - Others (e.g. NetFront, previous versions of the above)
  - Support most of the web standards, overview layout feature

- **Mid-range and low-end handset browsers**
  - Opera Mini
  - Handset vendor browsers (e.g. Nokia Series 40 browser)
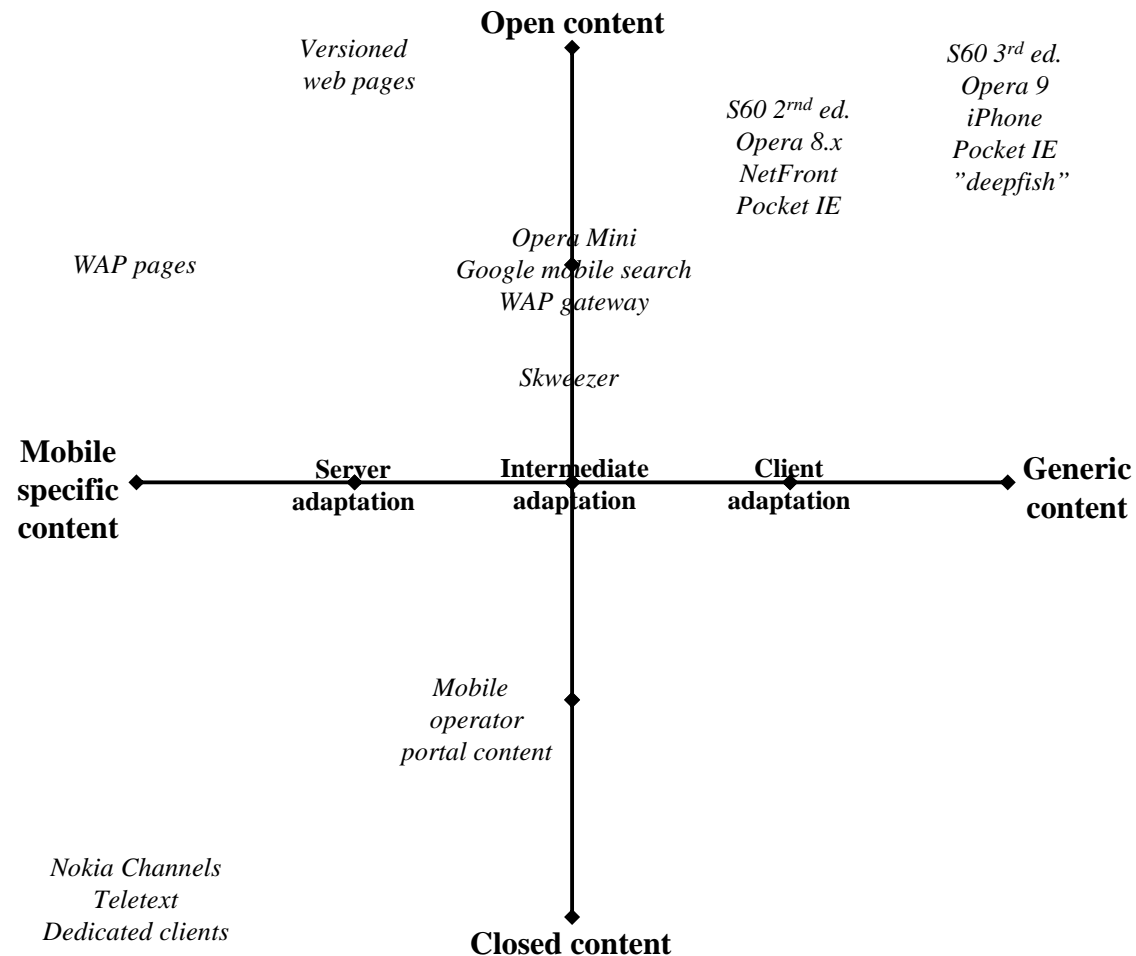 - UP.Browser (Openwave), Obigo Browser (Teleca)

Content Adaptation for Mobile Devices

- A need for adapting web content for mobile devices
  - Mobile computing many disadvantages compared to desktop PCs and wired connections
  - Content adaptation is a major research topic
- Many methods to adapt content
  - Transformations between XML languages, editing multimedia resources (quality, frame rate, resolution), page layout changes (narrow vs. original layout)…

- Server-side adaptation
  - Adaptation conducted by the service provider
  - Multiple authoring (many versions of content), single authoring (one version + adaptation)
  - E.g. service providers, mobile operator portals, Nokia Channels, non-operator WAP pages
- Intermediate (proxy) adaptation
  - Adaptation conducted by proxy servers, clients access the proxy instead of service provider
  - E.g. Opera Mini, mobile operator WAP gateway, Google mobile search, Skweezer…
- Client-side (browser) adaptation
  - Adaptation conducted at the client device similarly as in adaptation proxies
  - Efficiency issues as a small device does the adaptation instead of a server
  - E.g. Opera Mobile, NetFront, Nokia S60 browser…

Summary of Mobile Browsing Solutions

Open content

Versioned web pages

S60 3rd ed.
Opera 9
iPhone
Pocket IE
"deepfish"

S60 2rnd ed.
Opera 8.x
NetFront
Pocket IE

Opera Mini
Google mobile search
WAP gateway

WAP pages

Skweezer

Mobile specific content — **Server adaptation** — **Intermediate adaptation** — **Client adaptation** — **Generic content**

Mobile operator portal content

Nokia Channels
Teletext
Dedicated clients

Closed content

Players and Business Motives

- Mobile operators
  - No browser development, some dedicated clients
  - Content adaptation at WAP gateway and for the portal
  - More browsing, more revenues from data ("basic" data transmission, additional services)

- Handset vendors / software platform providers
  - Develop mobile browsers and other handset applications
  - No content adaptation (except by the browser)
  - Browser is core application in selling handset and platform licenses
  - Increasing data usage make new features more attractive to operators and end-users

- 3rd party software developers
  - Develop mobile browsers and dedicated browser substituting clients
  - Content adaptation (proxies) in some cases
  - License browser/other software to handset vendors, mobile operators, and end-users
    Extra fees from branded/customized

- Service providers
  - No browser development, some dedicated client (e.g. Gmail, Flickr clients)
  - Content versioning and adaptation at servers/proxies
  - Content adaptation adds another distribution channel (for content/services, and advertising)

Future of Mobile Browsing?

- Adapted vs. non-adapted content
  - Is content adaptation needed in the long-term? In low-end handsets?
  - First Internet usage experience in developing countries with a handset, not a PC?
  - Could some new standard truly separate content from presentation?
  - Discovering adapted content? Mobile operator portals, "mobile web" search, .mobi addresses

- Browser vs. dedicated clients
  - Mobile devices lag desktop PCs, in terms of hardware and software
    → mobile browsers not likely to ever fully catch up desktop browsers
  - Mobile browser improves → less dedicated clients for handsets
    Desktop browsers improve → more dedicated clients for handsets
  - The longer it takes to implement web technologies in mobile browsers,
    the more dedicated clients there will be for specific use cases

- Most popular browsers
  - Who installs browsers to handsets? Installed by vendor / operator / user
  - Handset vendors can push their own browsers (e.g. Nokia)
  - 3rd party browser developers need to cooperate with operators (e.g. Opera)
  - Microsoft Pocket IE success dependent on success of Windows Mobile
  - Apple traditionally targets niches, can iPod mass-market success be transferred to iPhone?

Thank You!