Developing Wireless Applications for Multiple Geographies

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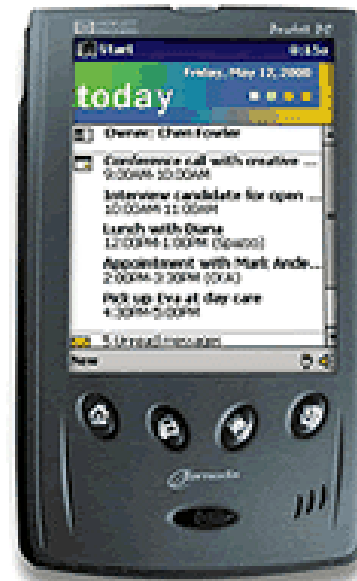
The Wireless World of Internet-Enabled Devices

- **Mobile Phones**
  - Microbrowser-enabled
  - Smart Phones

The Wireless World of Internet-Enabled Devices

- PDA (Personal Digital Assistants)
  - Based on Pocket PC or Windows CE
  - Jornada, iPAQ, etc.

The Wireless World of Internet-Enabled Devices

- Palm Pilots
  - Palm III or V with cradle
  - Palm VII (US only)

The Wireless World of Internet-Enabled Devices

- ## RIM Blackberry Pagers
  - Wireless e-mail

Standard Interface Technologies

- WML
  - Industry standard markup language for microbrowsers
  - Based on WAP Forum standards

- HDML
  - Original wireless markup language (Openwave)

- cHTML / iMode
  - Proprietary to NTT DoCoMo in Japan
  - Based on HTML

Standard Interface Technologies

- HTML
  - The language of the Web. Used in PDAs and Palm Pilots with Web Clipping technique

- Java / J2ME
  - Used in RIM devices
  - Becoming more and more popular

- Brew (Qualcomm)
  - A means to build applications that can be embedded into the phone (Qualcomm CDMA chipset phones)

Always-on vs. Synchronization

- Palm and PDAs
  - Synchronization is the default means of accessing Web content
  - Always-on is available with a subscription to a data carrier
  - Palm III and Palm V require special wireless cradles to access the Internet
  - Special 3rd party browsing software needed
    - Blazer is one that dynamically supports HTML and WML
    - A small version of MS Internet Explorer comes with PDAs

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Which Devices Support Which Technologies?

Phones	• WML • HDML • cHTML • Brew

Palm and PDAs	• HTML • WML

RIM Blackberry	• Java • WML • HTML

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Smart Phones vs. Regular Phones

- Regular phones only offer typical phone capabilities and have a dedicated microbrowser to access data services

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Smart Phones vs. Regular Phones

- Smart phones have more sophisticated operating systems with software for personal information management, e-mail, browsing, etc. Many are capable of downloading new programs from the Internet
  - Programs can often intercommunicate

Which Devices Are Supported in Which Geographies?

North America
- Phones (WML and HDML)
- Palm and PDAs (Always On)
- RIM Blackberry

Europe
- Phones (WML only)
- Palm and PDAs (Always On)
- RIM Blackberry (UK Only)

Latin America
- Phones (WML)
- Palm and PDAs

Africa
- Phones (WML)
- Palm and PDAs

Asia
- Phones (CHTML - Japan, WML, HDML)
- Palm and PDAs

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Differences in Markup Languages

- HDML
  - Arguably the strongest language designed for wireless devices
  - Engineered for phones
  - Powerful, complete feature set (Subscriber ID, Push Alerts, Data-to-Voice switching, nested navigation constructs)
  - Older technology, somewhat proprietary
  - Being phased out

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Differences in Markup Languages

- WML
  - Based on the newer WAP (Wireless Application Protocol) standard
  - Adoption is widening
  - Still in its infancy
  - Different browser manufacturers have interpreted WML specifications differently, resulting in very different browsers
  - Plagued by browser incompatibility problems
  - Missing key features in the base language (Subscriber ID, Push, nested navigation structures, etc.)

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Differences in Markup Languages

- cHTML (iMode)
  - Largest worldwide user adoption
  - Based on HTML (with 2 extra tags)
  - Japan only
  - Proprietary, invented by NTT DoCoMo
  - Aspirations of spreading to Europe and beyond

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Differences in Markup Languages

- HTML (for Palm and PDAs)
  - Can access any Website
  - Websites are not designed for smaller mobile devices
  - Doesn't work well for browsing
  - Web pages are designed for min. 800x600 resolution
  - Different PDA browsers produce very different results
  - JavaScript doesn't work
  - No Flash, Java, ActiveX, etc.
  - Browser type validation done by Web sites doesn't work

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The Secrets of Creating Great Wireless Applications

- Usability, Usability, Usability
- Maximizing usability means optimizing for each markup language
  - For best results, optimize for each browser brand
- What works in one device type probably won't work in another
- Use special wireless functionality when possible / applicable
- Do not code to the lowest common denominator

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Challenges In Architecting A Wireless Application

- Multiple devices
- Multiple markup languages
- Multiple browser brands
- Multi-lingual interfaces

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Beware Of False Profits

- Any Device, Anywhere, Anytime
- Any Good???
- These solutions often create solutions for the lowest common denominator and usually offer poor usability
- Until technologies start converging, you may have to do things the hard way to get the best results

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Template-based Construction

- Externalize the presentation layer from the program code / business logic
  - Business logic interacts with external templates dynamically when content is needed to be generated
  - Multiple templates are used to support multiple mark-up languages / device categories
- Use dynamic substitution variable in the templates to represent data content
  - Supports dynamic data
  - Supports multi-lingual interfaces
- Divide templates into blocks to support looping

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Special Wireless Features / Concepts

- Subscriber ID
  - Used to uniquely identify a phone on a worldwide scale
  - Not supported by all phones or all WAP gateways (unfortunately)

- Location-based Services (LBS)
  - The ability to locate a user geographically and offer him location-sensitive information
  - Still in its infancy
  - Location is provided manually, via GPS in the phone, or through cell-site triangulation
  - Total solution will involve many vendors working together.

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Special Wireless Features / Concepts

- Push / Notification Alerts
  - SMS (Short Message Service)
    - Used heavily in Europe and Asia
    - Limited to 160 characters
    - Cannot be used for transactional applications
  - WAP
    - Used to push WAP content to a phone
    - Easily linked into transactional systems
    - Limited to the size of a WML deck
    - Not supported in all geographies or by all WAP browsers

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Special Wireless Features / Concepts

- User Profiling
  - Tracking and storing user information in the application is important in wireless applications
    - Reduces typing and other repetitive actions
    - Application can be dynamically adjusted to simplify the interface
  - This functionality is often used in conjunction with Subscriber ID

Special Wireless Features / Concepts

- Dynamically weighted navigation
  - Based on user profiling, navigation of many wireless applications should be dynamic.
  - Choices selected most often should be dynamically moved to 1st level menus on a per user basis
  - Example: If a user constantly checks a stock quote application for the same stock, the application should dynamically offer a top-level branch to fetch the quote for that specific stock.

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Special Wireless Features / Concepts

- Special Notes
  - No one feature is available for all devices in all geographies
  - Roaming across carriers and countries often causes certain features to stop working.
  - It is important to compensate for these short-comings in the application
    - Do not rely on a specific feature unless you can control the user's device and geographic location

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How To Detect Browser Brands

- HTTP_USER_AGENT returns the type of browser being used to access an application
  - Look for UP.Browser with version numbers, Nokia7110, Mozilla, Ericsson, etc.
- HTTP_ACCEPT returns the list of mime data types the client can accept.
  - Search for wml, hdml, and/or html
- HTTP_ACCEPT_LANGUAGE returns the language ID corresponding to the language the phone is running in.
  - en, en-gb, fr, ja, etc…

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What Does The Future Hold?

- New telephony infrastructure
  - 2.5G (1-2 years) will bring transfer speeds of 64-128K bps
  - 3G (4 years) will bring transfer speeds of 384K bps; capable of supporting streaming video.
- Phones and PDAs are merging into newer smarter devices. (Smart phones are the first generation)
- Integrated voice and data; capable of talking and accessing data simultaneously (2-3 years)
- Color displays supporting richer graphics (1-3 years

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What Does The Future Hold?

- Bigger vs. Smaller devices???
    - More functionality often requires a bigger device, but consumers want smaller, discrete devices
- Roaming will always be a problem as long as there are different network standards
- New standard markup languages, like the much talked about XHTML will unify the browser community and (hopefully) eliminate incompatibilities. (3 years)

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And this is just the beginning...