Cátedra de Telefónica Móviles
Universidad de Deusto, Bilbao, SPAIN

mobility research lab

Geographical Mash-ups Session: Web 2.0, Mobile Devices and Ubiquitous Web

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Mobility 2.0 = Mobile Web 2.0

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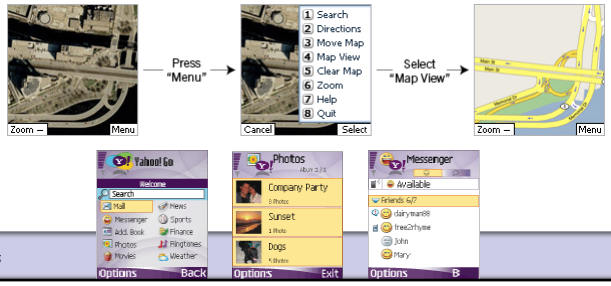
  - Web sites are becoming programmable
  - PROBLEM: We enjoy Web 2.0 in desktop but in mobile devices?
- Some relevant examples:
  - Google's Local for Mobiles (http://www.google.com/glm/)
  - Yahoo! Go Mobile (Contacts, Email, Photos, Messenger) http://go.connect.yahoo.com/go/mobile
  - Moblog clients (Mobile Blogger, KABLOG)



Mobile Mash-ups

- Mobile Mash-up: a web application adapted to mobile devices combining content from several sources into an integrated experience
  - Traditional mobile phone-based data usage is downstream
  - Mobile Mash-ups can definitely push the upstream usage
- Some cool mobile mash-ups:
  - Mobile Gmaps displays Google Maps, Yahoo! Maps, Windows Live Local and Ask.com Maps and satellite imagery on Java ME devices (http://www.mgmaps.com/)
  - Shozu = basic blog XML-RPC services + photo upload (http://www.shozu.com/portal/)
  - Socialight (http://socialight.com) places virtual "sticky" notes anywhere in the real world.
    - A StickyShadow = media (text, picture) + access rights + location

Platforms to Develop Mobile Mash-ups

- Two main models:
  - **Browsing apps**, web apps which take into account limitations unique to mobility (e.g. small device)
    - Client capable of hardly any processing
    - XHTML (ASP.NET Mobile Web Controls & JSF)
  - **Smart Client apps**: downloaded and installed in the device
    - Capable of some processing, storage and intermittent communication
    - J2ME, Compact.NET, Python for Series 60, BREW uiOne, Flash Lite
  - Other minor ones: **hybrid?**, SIM, messaging and embbeded apps
- Current problems of mobile space apps:
  - Few mobile services are profitable (broadcast ones)
  - No consensus, same application developed for several platforms

AJAX & Mobile Devices

- AJAX is a very important facet of Web 2.0
  - Avoids start-stop cycles thanks to Ajax Engine
    - The AJAX engine emits asynchronous calls to the server
    - The user **does not wait**
  - A combination of a number of existing technologies.
  - Solves two problems:
    - Superior UI experience
    - Standarised form of data retrieval

But NOT so much presence in mobile devices !!!

AJAX & Mobile Devices

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- Will AJAX replace J2ME, Compact.NET or XHTML as the platform to develop Mobile Applications?
  - AJAX (Asynchronous JavaScript and XML) makes **even more sense in the mobile space as it enables the creation of Web based services that are so fast they seem like local apps**
    - So far limited input and slow network connections prevented wider adoption
    - Now, simply load the AJAX app in the mobile and use XML to exchange data with the server:
      - Bandwidth constraint no problem any longer
      - Transparently update the information on the mobile

BUT WE NEED FLAT RATES AND ACCESS TO PHONE APIS!!!

AJAX support on Mobile Devices

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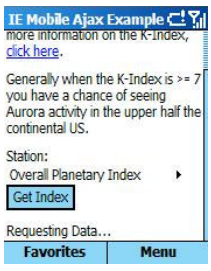
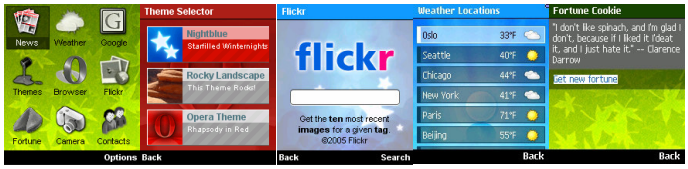
- All the devices that come with Opera Browser or Windows Mobile 5 support AJAX
  - High range Nokia s60 a s90
  - Nokia 770
- Small Rendering Technology paramount !!!



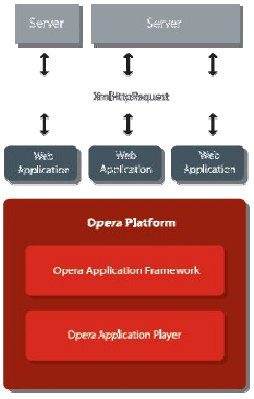
Hybrid approach: Opera Platform

- AJAX development on mobile devices is possible with the Opera Platform, code named Freedom
  - Based on well-known Web Technologies such as HTML, CSS and JavaScript http://www.opera.com/platform (homepage)
    - http://my.opera.com/operaplatform/links/ (documentation & tools)
- Features:
  - Enables integration between:
    - Handheld devices' local applications
    - Opera Browser environment
    - Operator's online content
  - Allows operators to push their content and services on the handset
  - Hybrid between Browsing and Smart Client apps



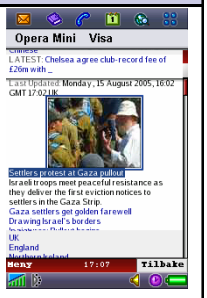
Opera Platform SDK

- The Opera Platform architecture consists of three parts:
  - **Application Player**, an extended version of the Opera browser, provides web applications with access to native phone functionality such as messaging, calendar, battery and signal status.
  - **Application Framework**, which supports interaction between installed web applications.
    - It also offers predefined UI elements, such as menu systems and dialog boxes to ease application development, according to Opera.
  - **Web applications** created with open standard technologies such as HTML, CSS and JavaScript.
    - Access the phone's functionality through the Opera Platform DOM interface
    - Communicate with servers using `XMLHttpRequest`



Opera Mini: Customizing Web Rendering

- Opera Mini is a Java ME web browser for mobile devices
  - Versions for low and high memory phones
- Fetches content through a proxy that runs the layout engine of the Opera desktop browser
  - Proxy uses Small Rendering Technology to reformat webpages
  - Content compressed 70-90% and delivered in OBML



Google Maps Mashups & Where 2.0

- There are many originals mash-ups out there based on GoogleMaps:
  - http://googlemapsmania.blogspot.com/
- Some examples:
  - Maplandia.com News Center (http://www.maplandia.com/news/)
  - Real-time location of Dublin commuter trains (http://dartmaps.mackers.com/)
  - HousingMaps gets the locations of properties for sale or rent from Craigslist on the fly
  - Cheap Gas (http://www.mywikimap.com/)
  - Chicagocrime.org that taps into Google Maps to display where crimes occur in Chicago (http://www.chicagocrime.org/map/)
- Where 2.0 is a conference that gathers people on location-based web apps

An Interesting Mobile Mash-up Scenario

- "I was sitting in the back of a cab one Saturday evening. I was using Kmaps (http://kmaps.ulocate.com/) to pull up listings of the closest restaurants. I choose one based on user posted reviews, directed the driver using an attached Google Maps mash-up, and upon arrival, tagged the map with my precise location so my friend could meet me. My friend wanted to know what the restaurant was serving before he decided to come so I snapped a picture of the menu, uploaded a quick picture and note to my blog with my tagged location and was immediately called by a 3rd friend who had seen the blog post and wanted to come as well"
  - http://marketspaceadvisory.typepad.com/marketspace_advisor/2006/02/adventures_with.html

Ubiquitous Web & Geofolksonomies

- Ubiquitous Web (UW) = pervasive web infrastructure in which all physical objects are resources accessible by URIs, providing information and services that enrich users' experiences in their physical context as the web does in the cyberspace
  - Apps dynamically adapt to the user's needs, device capabilities and environmental conditions.
- Making UW reality:
  - Social tagging is a very efficient way of categorizing resources on the web, e.g. del.icio.us
  - GeoFolksonomies = social tagging of geographic locations, e.g. Tagzania, mobile version?
  - AwareFolksonomies = users may associate objects with contextual attributes and metadata
    - If the contextual attributes are met the metadata is made available

Deusto Sentient Graffiti

- We want to make Ubiquitous Web reality through an Aware Folksonomy:
  - Mixing social tags, location, profiles, preferences, Semantic Web
- **Goal:** enable the edition, discovery and navigation of virtual post-it notes placed in the Deusto campus
  - A post-it note is an XML document with some contextual attributes (profile of creator, location, time interval, attributes (tags))
  - An inference engine will in real-time match the mobile device owner's context against the available post-it notes at his location
  - Should work both indoors (RFID) and outdoors (GPS)
- Hardware requirements: Wi-Fi, GPRS/UMTS, GPS, RFID

Google Map Extension Hacks

- Web Map Service (WMS) produces a map from a URL
  - map = portrayal of geographic information as a digital **transparent** image file (.GIF o .PNG)
  - URL indicates what information is to be shown on the map:
    - portion of the earth
    - desired coordinate reference system
    - output image width and height
  - Specification managed by Open Geospatial Consortium (OGC)
    - http://portal.opengeospatial.org/files/?artifact_id=5316
- Overlay Custom Maps over Google Maps
  - http://blog.kylemulka.com/?p=287
  - http://johndeck.blogspot.com/
- Automatic Tile Cutter (retrieves .PNGs from Google Maps Tile Server)
  - http://mapki.com/index.php?title=Automatic_Tile_Cutter
- Geocoders: assigning geographic coordinates (e.g. latitude-longitude) to street addresses

Conclusion

- Arrival of Web 2.0 dynamic asynchronous interfaces to mobile devices will make us forget WAP's bad experience
- Mobile Mash-ups can foster up-stream data usage
  - Mobile operator's can significantly increase ARPU
- Mobile Mash-ups can be really helpful and are finally reality with available mature platforms
  - Hybrid browsing/smart client platforms seem the future

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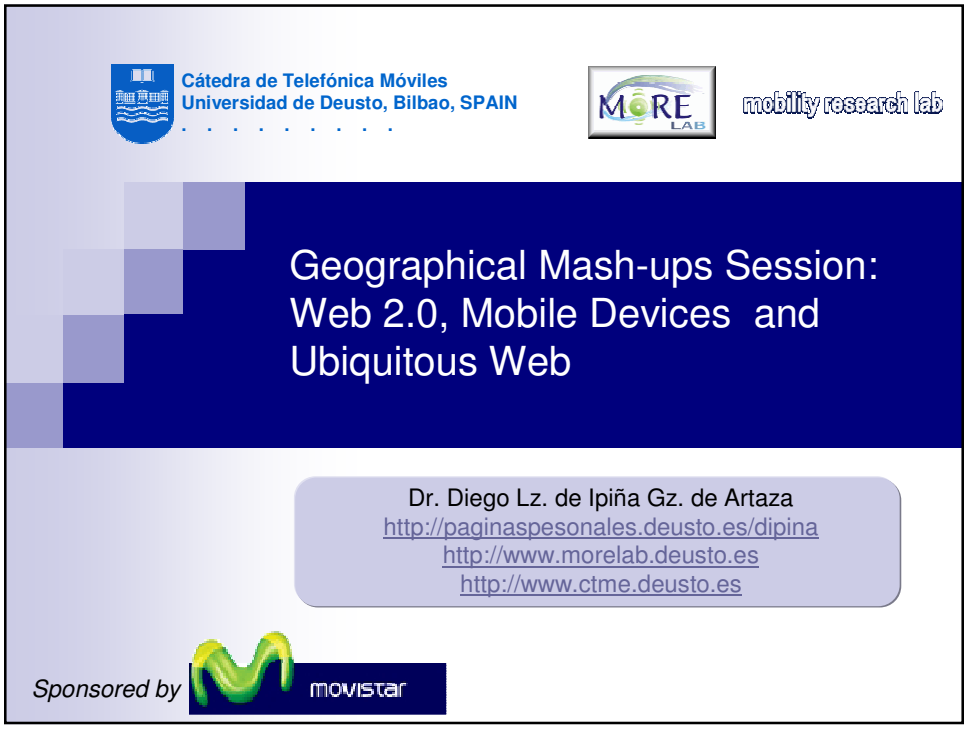
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