Remote Control of Web 2.0-enabled Laboratories from Mobile Devices

eScience 2006
Amsterdam, Netherlands

December 4, 2006

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Some visionaries and leading companies are considering moving the new Web 2.0 paradigm from the desktop to mobile devices.

The subject of the presentation is to describe advantages and disadvantages of transforming a Remote Laboratory in a Web 2.0-enabled application accessible from mobile devices.
Introduction

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- The subject of the presentation is to describe advantages and disadvantages of transforming a Remote Laboratory in a Web 2.0-enabled application accessible from mobile devices.
As just said, Web 2.0 is a *buzzword* referencing:

- All new popular applications born in the last two years
- Participative web from humans and machines
- An important change in the way to see the Web
  - Read/Write Web vs The Web as platform

One of the main technologies (or groups of technologies) which has allowed the creation of these platforms is AJAX
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AJAX (Asynchronous JavaScript And XML)

- is a new approach for web development
  - is being applied to sophisticated web applications (GMail, Google Maps)
- uses only web standards (JavaScript, DOM, HTML...): no plug-in is required in the web browser
  - works successfully under many browsers and platforms
- can use SOAP Web Services:
  - being able to cross firewalls or web proxies
- allows us to rely security aspects on the web browser
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With AJAX, after user interaction, only fragments are sent (instead of whole web pages)
Programming AJAX

- Programming AJAX used to be quite difficult
  - programming JavaScript is quite tough
  - making the application available for diverse browsers is sometimes difficult
- But as industry has adopted AJAX, platforms for AJAX development have been created
  - Libraries for JavaScript (Prototype, Script.aculo.us, Rico…)
  - AJAX in web development platforms (Sajax, Pajax for PHP, DWR for Java, ASP.NET AJAX for .NET…)
  - Even compilers from Java to AJAX! (Google Web Toolkit)
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**But** AJAX is not the answer for everything:
- It doesn’t support accessibility for disabled people
- It is limited in terms of performance for:
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Applying AJAX to a Remote Laboratory

- **WebLab-Deusto** is, since version 2.0, an AJAX enabled Remote Laboratory
  - Three versions are now being used by students:
    - WebLab-PLD
    - WebLab-FPGA
    - WebLab-GPIB
  - Tested during development under several web browsers (Microsoft Internet Explorer, Mozilla Firefox, Opera...)
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WebLab-Deusto: Demo

First, let's try it:
WebLab-Deusto 2 architecture
Mobility 2.0

- Mobility 2.0 tries to bring Web 2.0-enabled applications to the mobile domain
  - Many Web 2.0 applications are doing this:
    - Google Mail, Google Maps, Yahoo! Go Mobile: J2ME applications for our cellular phones
  - Concept of **Mobile mash-up**:
    - *mash-ups*: web application that combines content from several sources
    - **Mobile mash-ups**: Web applications
    - Applications using blogs, photo management, messenger, e-mail... from your mobile phone in an integrated experience
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Two approaches:

- Browsing applications
  - XHTML, WML...
  - Very limited: useful for devices with very few processing capabilities

- Smart client applications
  - J2ME, Compact.NET, Python for Series 60, C / C++, Flash Lite...
  - More powerful applications
  - Problem: portability
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AJAX and Mobility 2.0

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  - And the fact that it downloads only what it needs makes it very suitable for mobile devices
- AJAX solves two problems of mobile applications:
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You can now use the WebLab

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Activate
WebLab-Deusto 3

The uses of a mobile WebLab are more interesting in collaborative Remote Laboratories (next version of WebLab-Deusto)
Disadvantages

- There are still many devices that are not supported by any AJAX-enabled web browser
- A J2ME/Compact.NET/Python/FlashLite application can make better use of the device
  - They can use proprietary protocols which have better performance
  - They can be more prepared for the screen and capabilities of mobile devices
- With this approach, the Remote Laboratory is tied to HTTP based protocols
  - Sometimes the performance this provides is not good enough
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  - Adding a new feature to the Remote Laboratory implies:
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Tired of struggling with IE vs Firefox, DHTML vs Flash? Get involved today and help turn OpenLaszlo into your universal tool for web application development.

Learn More...
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  - More sophisticated Operating Systems
  - Communication networks offer better bandwidth and prices
- **Potential benefits of enabling remote mobile access to WebLabs:**
  - Students may work on their assignments while going to their residences, or while gathering a meeting with colleagues
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Questions

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