JavaScript and AJAX Accessibility

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Agenda

- What is AJAX and why do I care?
- What are the Issues with AJAX?
- How do I make my AJAX applications Accessible?
  - Using HTML Techniques
  - Using DHTML Accessibility Techniques
- Demonstration of techniques
- Summary
What is AJAX?

- AJAX = Asynchronous JavaScript and XML
- Allows incremental update of Web pages.
- Built using standard web technologies - HTTP, (X)HTML, CSS, JavaScript, Document Object Model (DOM), XML
- Used by many popular internet companies.
- Examples:
  - Google Suggests, Google & Yahoo! Maps
  - Amazon A9 Search
  - Flickr, BaseCamp, Kayak
  - Yahoo! AJAX Library
Traditional Web Interaction

Client makes http request

Server returns a new page

Web server
How AJAX works

Client makes http request for specific information

Server returns the requested information

Multiple requests are served
Why Do I Care About AJAX?

- Enables building Rich Internet Applications (RIA)
- Allows dynamic interaction on the Web
- Improves performance
- Real-time updates
- No plug-ins required
What are the Issues with AJAX?

- User does not know updates will occur.
- User does not notice an update.
- User can not find the updated information.
- Unexpected changes in focus.
- Loss of Back button functionality*.
- URIs can not be bookmarked*.

*These issues will not be discussed as they are not specific to accessibility.
Specific Accessibility Issues

- **Assistive Technology users are not aware of updates**
  - Updates occur on a different section of the page than the user is currently interacting with.
  - Clicking a link updates a different section of the page.
  - Auto-complete fields or generated options not available to assistive technology.
  - User has no idea how to find new or updated content
  - Changes in focus prohibit complete review of the page
  - Changes in focus cause disorientation and additional navigation.
Informing the User

- **Explain the interaction to the user**
  - Before accessing the AJAX enabled page
  - Within the AJAX enabled page

- **Where possible, provide a manual update option**
  - Necessary for WCAG 2.0 Guideline 2.2

- **Save the user’s update preference**
Make updates Noticeable

- **Change the background color of updated data**
  - Use a subtle color
  - Change only for a few seconds
  - Best for small areas of the page

- **Briefly blink the updated data**
  - Blink for 3 seconds or less (WCAG 2.0 Guideline 2.2)
  - Avoid the flash threshold (WCAG 2.0 Guideline 2.3)
Help Users Find Updated Information

- Provide option for updates via an Alert
- Provide option to set focus to new data.
- Use HTML header tags to mark sections with updated content.
- Use DHTML Accessibility Alert role in conjunction with a floating pop-up box.
- Use DHTML Accessibility Description role to describe new content.
DHTML Accessibility Techniques and AJAX

- DHTML Accessibility allows the creation of desktop style widgets on the web
- Full keyboard navigation without excessive use of the tab key
- Allows easy navigation from component to component and to updated content.
- Allows non-intrusive notification of updated content via Alert
DHTML Accessibility Overview

- Add keyboard event handling
- Add role and state information
- Make items focusable via tabindex attribute
- Update state information dynamically
DHTML Accessibility Overview (continued)

- **Works in HTML or XHTML**
  - XHTML
    - Uses XHTML 1.x role attribute
    - Uses namespaces to add state attributes
  - HTML
    - Embeds role and state information into class attribute
    - Accessibility Script library sets the role and state using DOM apis
Example using XHTML

<html lang="en" xml:lang="en" xmlns="http://www.w3.org/TR/xhtml2"
xmlns:wairole="http://www.w3.org/2005/01/wai-rdf/GUIRoleTaxonomy#"
xmns:waistate="http://www.w3.org/2005/07/aaa">

.........

<span id="slider" class="myslider myselector2"
role="wairole:slider"
waistate:valuemin="0"
waistate:valuemax="50"
waistate:valuenow="33">
</span>
Example Using HTML

<!--DOCTYPE HTML PUBLIC "-//W3C//DTD HTML 4.01 Transitional//EN" http://www.w3.org/TR/html4/loose.dtd -->
<html lang="en">
<head>
<script type="text/javascript" src="enable.js"></script>
</head>

..................

<span id="slider" tabindex="0"
class="myslider myselector2
axs slider valuemin-0 valuemax-50 valuenow-33" >
</span>

Technique described at:

http://www.w3.org/WAI/PF/adaptable/HTML4/embedding-20060318.html
Summary

- AJAX is a powerful technology for making dynamic web applications.
- AJAX applications can present Accessibility barriers.
- Simple changes to application design can make AJAX usable for all.
- DHTML Accessibility Techniques fit well with AJAX
Questions?