A Web 2.0 Approach to Improving Web Accessibility

Jeffrey P. Bigham

Advisor: Richard E. Ladner

University of Washington
Computer Science & Engineering
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http://www.aya.yale.edu/
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Olympian swimmer...
WebinSitu: A Comparison of Blind and Sighted Browsing Behavior

Jeffrey P. Bigham
Anna C. Cavender, Jeremy T. Brudvik, Jacob O. Wobbrock* and Richard E. Ladner

Computer Science & Engineering
The Information School*
University of Washington
Study Overview

- Proxy-based observation for one week
- 10 Blind and 10 Sighted (Ages 18-63)
- Either Internet Explorer or Firefox
- Blind participants used JAWS

- 21,442 Pages
- 4,204,904 Events

Geographic Diversity of Users
**A Proxy-Based System**

- Used UsaProxy¹

More than a regular proxy

Requests

|------|------------------------------------------------------------|

Actions

| Keypress, ctrl f, 10 Oct 2007 04:12:35 |
| Mouse, 540x232, 10 Oct 2007 04:12:36 |
| Focus, Text Box (name), 10 Oct 2007 04:12:36 |
| Page Changed, 10 Oct 2007 04:12:39 |

Content

| Image, alt="Contact Us", src="http://www.washington.edu/pics/contact.gif |
| Link, name="University of Washington", url="http://www.washington.edu" |
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Alumni directory now

Update Address

Update Address

/olc/pub/YALE/oldintro/oldintro.cgi
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Update Address

/Olc/pub/YALE/oldintro/oldintro.cgi
Images and Appropriate Alt. Text

- % of Images with App. Alt. Text
  - Did not influence browsing behavior

- Influenced Clicking Behavior:

<table>
<thead>
<tr>
<th></th>
<th>Blind</th>
<th>Sighted</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clicked Images with App. Alt. Text</td>
<td>72.2%</td>
<td>34.0%</td>
</tr>
</tbody>
</table>

*p < 0.01*

% of Images Assigned Appropriate Alternative Text on Visited Pages
Because screen readers move content to an off screen buffer, dynamic content is not updated.

Original Content.
Because screen readers move content to an off screen buffer, dynamic content is not updated.

Content has been changed.
**Dynamic Content**
- 15.0x fewer pages viewed \( (p < 0.07) \)
- 19.3x fewer interactions with dynamic content \( (p < 0.01) \)

**AJAX**
- 7.5x fewer \( (p < 0.05) \)

**Flash**
- 44.1% were ads
- Blind participants used for sound content
- Only 5.6% were main content
WebAnywhere

A Screen Reader On-the-Go

Jeffrey P. Bigham, Craig M. Prince and Richard E. Ladner

University of Washington
Computer Science & Engineering
Price Perspective

JAWS Screen Reader

~$1000.00

New DELL Computer

~$349.00
WebAnywhere Web Application

Server-Side
- Text to Speech
- Reverse Proxy

Client-Side
- WebAnywhere Script
- Transformed Web Page
- Sound Players
  - Embedded Player
  - Flash Player

Web Page

WebAnywhere

Server-side TTS
Minimal Client Reqs.
Demo
Thanks to: National Science Foundation, T.V. Raman, Sangyun Hahn, Lindsay Yazzolino and GW Micro.