Blaise IS and Accessibility

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Agenda

- Background
- Blaise® for Windows accessibility
- Blaise Internet Services accessibility
- IS architecture
- Section 508 Standards
- Automated accessibility testing of IS Surveys
- Screen reader testing of IS
- A broader approach to Web survey accessibility

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Blaise for Windows and Screen Readers

In 2003 customer reported

- Blind application software tester could not make Blaise applications in the Windows environment run with JAWS screen reader.

Investigated and learned

- Custom-developed scripts for JAWS are common to cue screen reader to idiosyncracies of an application's user interface
- Consultants experienced in JAWS scripting available through www.blindprogramming.com

Westat sponsored development of a JAWS script for the Blaise Data Entry Program (DEP) UI

- Initial script developed in about 12-15 hours
- Testing by blind user found script worked very well
- Script available to others (contact blaise@westat.com)

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Blaise IS (Internet Services)

New challenges

- Browser environment diverse and controlled by user
- Users are often the general public not survey staff
- Richer presentation features and user-interface elements

Accessibility testing and evaluation must be

- Pro-active and continuing
- At the application as well as systems levels

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IS architecture – a higher level approach

Core technology is ASP, XML, XSL

- High level approach, little or no direct HTML coding
- Developer builds datamodel in same way as Win CAPI or CATI
  - Web look-and-feel set with LAYOUT statements and the mode library UI parameters
  - Mixed-mode CATI-CAWI can be authored in one code set
- Web survey characteristics set in specification file
  - Start/end ASP pages, XSL stylesheet to generate HTML pages, etc.
- On server IS receives response, runs datamodel rules, generates next page's information in XML, & XSL generates the HTML page
- XSL stylesheet key to look-and-feel and HTML code
  - Single location for implementing accessibility enhancements

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Section 508 standards *for Web-based intranet and internet information and applications*

(a) Text equivalent for every non-text element (e.g., via "alt", "longdesc", or in element content).

(b) Equivalent alternatives for any multimedia presentation shall be synchronized

(c) Web pages information conveyed with color also available without color

(d) Documents organized so they are readable without requiring an associated style sheet.

(e) Redundant text links provided for each active region of a server-side image map.

(f) Client-side image maps provided instead of server-side image maps.

(g) Row and column headers identified for data tables.

(h) Markup used to associate data cells and header cells for data tables that have two or more logical levels of row or column headers

(i) Frames titled with text that facilitates frame identification and navigation.

(j) Pages designed to avoid causing the screen to flicker with a frequency greater than 2 Hz and lower than 55 Hz.

k) A text-only page, with equivalent information or functionality, shall be provided …when compliance cannot be accomplished in any other way.

(l) When pages utilize scripting languages to display content, or to create interface elements, the information provided by the script shall be identified with functional text that can be read by assistive technology.

(m) Web page requiring that an applet, plug-in or other application on the client system to interpret page content, must provide a link to a plug-in or applet that complies with §1194.21(a) through (l).

(n) Electronic forms designed to be completed on-line shall allow people using assistive technology to access the information, field elements, and functionality required for completion and submission of the form, including all directions and cues.

(o) A method shall be provided that permits users to skip repetitive navigation links.

(p) When a timed response is required, the user shall be alerted and given sufficient time to indicate more time is required.

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Accessibility testing of Blaise IS Surveys

IS surveys may have hundreds of page. How to test that 508 standards are met?

- Free online tools require submitting individual pages
- Needed a high volume process
- AccVerify (www.hisoftware.com) able to evaluate multiple pages in batch mode
- Capturing Blaise IS pages
  - Adapted IS ASP page handler process (biPagHan.asp) to save to a file every page generated in a test interview
- Passed generated pages into AccVerify
- Reviewed reports

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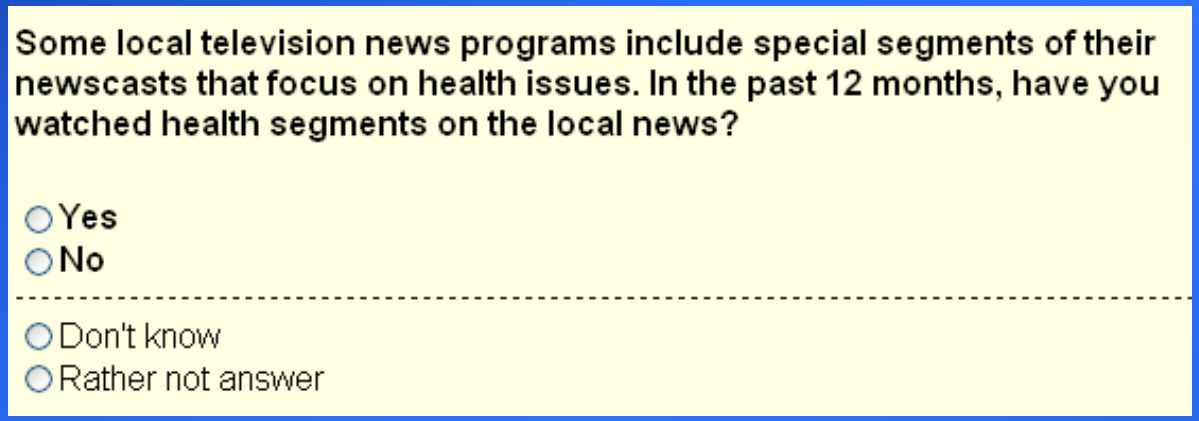
AccVerify testing

Reports identified “failed” pages

- Mainly graphical elements lacking a text attribute “Alt=“



A. 508 Standards, Section 1194.22, (a) A text equivalent for every non-text element shall be provided (e.g., via "alt", "longdesc", or in element content).
Rule: 1.1.2 - All INPUT elements are required to contain the alt attribute or use a LABEL.
Failure - INPUT Element, of Type RADIO, found at Line: 620, Column: 18
Failure - INPUT Element, of Type RADIO, found at Line: 661, Column: 18
Failure - INPUT Element, of Type RADIO, found at Line: 702, Column: 18

Blaise IS Changes

- Issues reported to Blaise team and quickly fixed
  - Changes made to interview page XSL stylesheet
  - Apply directly to subsequent IS surveys
- Repeated cycle
  - Testing various surveys
  - Processing pages in AccVerify
  - Reporting failures
  - Conferring with Blaise team
  - Receiving a revised interview stylesheet
  - Retesting to confirm
- Process showed
  - Flexibility of IS XML/XSL architecture
  - Limitations of automated testing

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Screen Readers

- Automated testing of HTML code is useful but limited
  - Screen readers often handle things AccVerify fails
  - Conversely, readers can be stumped by survey elements that meet the specific 508 standards
- Readers ability to interpret page correctly is acid test
- Testing with reader can be difficult for inexperienced
  - Readers rely heavily on key-combinations entered by user to navigate about the page
  - JAWS has ~66 of them

Screen Reader Testing

Tests with JAWS of Blaise IS samples surveys

1. Westat user with normal vision and a few hours experience with JAWS
2. An accessibility consultant who is blind and experienced with JAWS and other screen readers

Tests

Sighted Blaise developer found;

- Reads header but not footer (Prev, Next buttons)
- Items with text introducing an item—not reading preface
- At times not reading enumerations past first empty selection
- Tables—column labels not read
- Items with icons to left (Help & Comment) not read properly

Blind consultant

- Overall 70-80% of full accessibility
- Need explicit titling of columns with <TH> tag
- Form elements need a <Label for="idname">
- Recommends alt-key combinations for key navigational elements, <Prev>, <Next> etc.
  - Not a 508 requirement but handy for users

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Test

- Only one element identified by both test
  - Labels for table columns
- Rest of the items raised by sighted user, the blind user didn't report a problem
- Conclusions:
  - Inexperienced JAWS users have limited value as testers
  - Ad hoc approach of finding problems is insufficient
  - Issues to be considered greater than initially believed

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Second stage

- Pursuing specifications to address all identified issues
- Integrating other's guidelines
  - E.g. BLS draft guidelines
- Revise interview XSL stylesheet to make IS surveys accessible to 9x%
- Continue evaluation and testing

Broader Approach to Web Survey Accessibility

- Various agencies and organization working on 508 issues
- Social Security Administration (SSA) most advanced
  - Elderly and disabled are major constituencies
  - Developed processes and materials on how to apply Section 508 for
    - Officials, software developers and vendors

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SSA's Accessible Solutions and Usability Branch

Produced valuable materials, e.g.

"Guide to Applying Section 508 Standards"

- SSA's interpretation and specification of each requirement
    - assistive technology to be supported
    - recommended evaluation criteria
    - testing method to judge whether the requirement is met

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Standard 1194.22.a: A text equivalent for every non-text element shall be provided (e.g. via “alt”, “longdesc”).

SSA Interpretation	AT users shall be able to access all meaningful non-text elements.
Requirement (a.1)	*Supported By*: JAWS *Recommended Evaluation Criteria*: All alt text must be meaningful and speak when accessed. *Testing Method*: Tab through controls to ensure that they speak and are meaningful. Arrow through images to see that they speak and are meaningful.
Requirement (a.2)	*Supported By*: JAWS, MAGic, Dragon *Recommended Evaluation Criteria*: All alt text or any equivalent must be exposed by the keyboard or voice input. *Testing Method*: Navigate by keyboard to see whether alt text or tool tips are exposed by using the keyboard or voice. ASB has developed a JavaScript capability to accomplish this.
Requirement (a.3)	*Supported By*: JAWS MAGic, Dragon *Recommended Evaluation Criteria*: All text links must have alt text beginning with the screen text shown. *Testing Method*: Use AT to expose alt text using screen readers, keyboard, or voice input.

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Two of the six standards relate to surveys

Total of 110 total requirements for the two standards and 37 seem relevant to Blaise IS and screen readers.

Selected requirements (21a1)

- 1, 2: Hotkeys must be assigned to commonly used control elements or notebook tabs to provide comparable mouse access.
  - Tabbing which results in excessive keystrokes (more than 3) to activate element is non-compliant.
  - Hotkeys must be assigned to links used repeatedly on more than one screen.
- 3, 4 : Tab indices to significant text information, directional cues, and error text
- 6: Navigation to screen elements with keyboard/voice in a comparable manner to a mouse.
- 10: Keyboard must be used to open list boxes, open and close tree structures, and navigate to the next logical item in proper order.
- 11: Navigation to radio buttons using arrow keys, items in a combo box, list views, or check boxes must not automatically select the item and/or change focus.

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- The 37 IS and screen reader-related requirements group into five areas:
  - Speaking all controls, labels, directions, non-text elements, and in a logical order
  - Hot keys and tabbing
  - Navigation
  - Tables
  - Error handling
- Some elements currently in system. But others may be challenging to implement.

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Detailed review of IS based on SSA criteria

- Performed evaluation of IS using SSA criteria
- Found issues on
  - Labeling of rows and columns of tables
  - Tab stop for auxfield introductory element
  - Tabbing order from last input control to Next > Previous buttons
  - Hotkeys
  - Top-of-page errors messages and links
- Communicated evaluation with Statistics Netherlands
  - Handout
- About to retest the latest beta of Blaise 4.8

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Conclusion

- Accessibility is an important issue for Blaise IS
- IS architecture and emerging specifications of accessibility requirements provide a way forward
- SSA framework invaluable for evaluating web systems and communicating to all stakeholders on the requirements and issues
- With this and the responsiveness of the Blaise team, reasonable to expect that Blaise IS's level of accessibility for the visually impaired can be raised to the 9x% level.

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