

Measuring the Sight of Your Web Site

by Diane Kester

When the Internet was primarily text-based (remember Gopher and Lynx?), electronic readers could follow the text easily. The World Wide Web, however, makes heavy use of graphics, and the visually impaired have been unable to take full advantage of the wealth of information stored electronically.

According to a policy ruling on September 9, 1996,¹ the Americans with Disabilities Act (ADA) accessibility requirements apply to Internet Web pages. Specifically addressing the needs of the visually impaired, the policy identifies a text format alternative for screen readers. Because of this legislation, Web accessibility issues are now being faced by educational institutions and libraries. A recent article in the *NASSP Bulletin* discussed the concerns of school systems that must meet the needs of the visually impaired to use Internet information for electronic reference, e-mail, and research projects. For some schools and their students, the first step is gaining access to the necessary adaptive technologies.²

Classification of Visual Impairment

There are two categories of visual impairment: partial blindness and total blindness. Those who are partially blind may use computer systems by means of screen magnification devices, and special software that displays the screen text in extra large fonts; however, a screen magnifier enlarges only a portion of the screen at a time.

For the totally blind, two devices are

available. The first is a speech synthesizer that reads the screen aloud; however, it can usually read only printed text, not graphic images. A second device turns lines of text on the screen into Braille. A blind patron uses arrow keys or special keys on a keyboard to scan the screen. In order to browse on the Web, a visually impaired person can use a standard browser equipped with a screen reader or use a special browser. Either way, a blind user encounters a fragmented document, complex and difficult to understand.

Awareness

For four years I have been teaching distance learning classes on the Internet. I design and create pages for the courses and have been conscious of the difficulties my students experience when accessing Web pages. I recently became interested in Web accessibility to the visually impaired through an online course produced by Equal Access to Software and Information (EASI). The online workshop was a collaborative effort between Dr. Norman Coombs and Richard Banks. Dr. Coombs, chairman of EASI, is a Rochester Institute of Technology history professor who is visually impaired. Richard Banks is a visually impaired adaptive technologist with the University of Wisconsin-Stout's library who also serves as moderator for EASI's AXSLIB1 (the leading Internet discussion list on library and adaptive technology for persons with disabilities). EASI is a support group affiliated with the American Association for Higher Education and offers online workshops to help oth-

ers become sensitized to the needs of the visually handicapped. Students taking these courses soon realize that Dr. Coombs, himself, is blind. During the workshop, participants turn off the graphic display on web pages and try to navigate without using the mouse. Participants are always surprised at the difficulties faced by the visually handicapped.³

Problem Areas in Web Page Design

In DOS-based Internet programs, screen readers and voice synthesizers encountered few problems. In a Windows environment, however, graphics may be a blessing to the computer novice but they are a curse to the visually impaired. The first challenge faced by the visually impaired who attempt to use the Internet is the browser. Icons on the task bar and pull-down menus make the browser software difficult to use. Graphics can be one of the most troublesome elements on a Web page. Other problematic areas include frames, interactive forms, tables, and video.⁴ Colorful or graphical backgrounds just add clutter to a screen reader.

In a feature article about a blind computer consultant, Stroh reported that the voice synthesizer software that reads the computer screen may stumble when it encounters elaborate designs of Web pages. "Frames, tables or columns can render a screen reader speechless."⁵ Another problem is graphic images without descriptive text. All the reader says is "graphic."

Does this mean that Web pages

must be plain text on a white background? To address these concerns, the World Wide Web Consortium (W3C) formed the Web Accessibility Initiative (WAI).

WAI

The mission statement of the Web Accessibility Initiative (WAI) is as follows:

The W3C's commitment to lead the Web to its full potential includes promoting a high degree of usability for people with disabilities. The Web Accessibility Initiative (WAI), in coordination with organizations around the world, is pursuing accessibility of the Web through five primary areas of work: technology, guidelines, tools, education & outreach, and research & development.⁶

The W3C's commitment to lead the Web to its full potential includes promoting a high degree of usability for people with disabilities. For example, they have worked with other organizations and recently published guidelines for content development and page authors. On May 5, 1999, the World Wide Web Consortium announced the release of "Web Content Accessibility Guidelines 1.0.," which provides Web content developers with techniques to make their pages more accessible to people with disabilities.⁷ Not only will these guidelines be helpful to people using a voice browser or mobile phone, but they will also enhance the success of search engines.

The 16 guidelines are

1. Provide text equivalents for visual information (images, applets, and image maps).
2. Provide descriptions of important visual information.
3. Provide text equivalents for audio information.
4. Don't rely on color alone.
5. Use markup and style sheets properly.
6. Supplement markup to aid interpretation of text.
7. Create tables that transform gracefully.
8. Ensure that pages featuring new technologies transform gracefully (no frames, alternative presentation).
9. Ensure user control of time-sensitive content changes. [Author's note: Ensure that moving, blinking, scrolling, or auto-updating objects or pages may be paused or stopped.]

10. Ensure direct accessibility of embedded user interfaces.
11. Design for device-independence (not pointer dependent). [Author's note: Provide for the user to interact with a preferred input (or output) device — mouse, keyboard, voice, head wand, or other. If, for example, a form control can only be activated with a mouse or other pointing device, the person who is using the page without sight, with voice input, or with a keyboard, or who is using some other non-pointing input device, will not be able to use the form.]
12. Consider interim solutions.
13. Use W3C technologies and guidelines.
14. Supply context and orientation information. [Author's note: Grouping elements and providing contextual information about the relationships between elements can be useful for all users. Complex relationships between parts of a page may be difficult to interpret for people with cognitive or visual disabilities.]
15. Design clear navigation structures. Offer a site map or table of contents.
16. Design for consistency and simplicity.

To allow developers to use the guidelines easily, there is a checklist of checkpoints for Web content accessibility. The full checklist may be found on the Web at <<http://www.w3.org/TR/1999/WAI-WEBCONTENT-19990505/full-checklist.html>>. Each checkpoint has a priority level based on the checkpoint's impact on accessibility. Priority 1 is assigned to those that *must* satisfy the checkpoint, priority 2 to those that *should*, and priority 3 to checkpoints that a Web content developer may address to improve access.

Space does not permit the inclusion of the complete checklist; however, priority 1 level provides minimum accessibility to library patrons. The first reads "Provide a text equivalent for every non-text element (e.g., via "alt," "longdesc," or in element content). This includes: images, graphical representations of text (including symbols), image map regions, animations (e.g., animated GIFs), applets and programmatic objects, ascii art, frames, scripts, images used as list bullets, spacers, graphical buttons, sounds (played with or without user interaction), stand-alone audio files, audio track of video, and video."⁸ Other areas address the use of images and image maps, tables, frames, applets and scripts, and

multimedia. Under the "And if all else fails" category is "If, after best efforts, you cannot create an accessible page, provide a link to an alternative page that uses W3C technologies, is accessible, has equivalent information (or functionality), and is updated as often as the inaccessible (original) page."⁹

Other organizations have suggested the following practices to enhance accessibility.

- Place a link label "D" at the very beginning of any Web page. The link is a description of the page, including of any graphics and buttons and the size of tables.
- Provide navigation tools and orientation information in the pages.
- Separate the content from the structure of the page as it is being developed.
- Provide equivalent information for documents. PDF is difficult for a screen reader; provide alternatives.
- Test your Web pages without using a mouse to give a sense of what a blind person will encounter.
- Place the most important links at the top of the page. This helps the reader determine the most important parts of the Web presence.

NCAM

A project announced in 1996 by the CPB/WGBH National Center for Accessible Media (NCAM) is also working to make Web pages more accessible to users with disabilities. The Web Access Project researches, develops, and tests methods of integrating access technologies (such as captioning and audio description) and new Web tools into a World Wide Web site, to make it fully accessible to blind or deaf Internet users. In 1997, the project focused its efforts on Public Broadcasting Web sites. They are working with Microsoft, the World Wide Web Consortium's Web Accessibility Initiative (W3C/WAI), and QuickTime to develop methods for making video clips accessible. Captioned audio files can provide access for the hearing impaired.

NCAM uses a D link at the very beginning of the page to describe the page and graphics. A sample from the WGBH Web page D link to the Image Description reads:

Five selectable images stretch across the top of the page. From left to right, they read: 'TV,' 'Radio,' 'Web,' 'Learn,' and 'Events.' Below is the WGBH

logo, followed by the words, 'Public Broadcasting from Boston. Check out our local schedules, the PBS and public radio programs and Web sites we produce, our educational services and our media access solutions for people with disabilities.'

Return

Image Description:

Web Access Symbol. A globe, marked with a grid, tilts at an angle. A keyhole is cut into its surface. Return¹⁰

Web Access Symbol used by NCAM¹¹



Devices and Industry Efforts

Information technology companies recognize the different needs of special populations and seek to improve the marketer's understanding of end-user concerns by attending conferences. Among those companies is Microsoft, which has an accessibility and disabilities group. It uses the Internet for marketing and provides text-only format <<http://www.microsoft.com/enable>> especially for the visually impaired.¹² A recent announcement in *American Libraries* describes the IBM Home Page Reader as "a spoken on-ramp to the Information Highway."¹³ The software combines a speech synthesizer with Netscape Navigator to convey the information on the computer screen. Other companies are developing software/modem combinations that enable hearing impaired users to convert their computer into a Telecommunications Device for the Deaf system.¹⁴

Evaluation of Web Pages for Accessibility

The Web contains many resources about accessibility. As the Center for Applied Special Technology (CAST) states: "over the last several years, CAST has undergone a major shift in its approach: CAST now believes that the most effective strategy for expanding opportunities for individuals with disabilities is through universal design for learning. The phrase 'universal design' refers to the creation of computer software and learning models that are useable by everyone, including individuals of all ages, whether they are gifted, are typical learners, or have special needs." <<http://www.cast.org/>

about/mission.html> (August 19, 1999) Founded in 1984, CAST is a not-for-profit organization whose mission is to expand opportunities for people with disabilities through innovative uses of computer technology. CAST offers a browser tool called *Bobby* <<http://www.cast.org/bobby/>>. *Bobby* is a Web-based public service that analyzes Web pages for their accessibility to people with disabilities. The analysis of accessibility is based on the W3C's WAI Page Author Guidelines.

To become *Bobby* approved, a Web site must

- provide text equivalents for all non-text elements (i.e., images, animations, audio, video)
- provide summaries of graphs and charts
- ensure that all information conveyed with color is also available without color
- clearly identify changes in the natural language of a document's text and any text equivalents (e.g., captions) of non-text content
- organize content logically and clearly
- provide alternative content for features (e.g., applets or plug-ins) that may not be supported

"*Bobby* also analyzes Web pages for compatibility with various browsers. Analysis is based on documentation from browser vendors when available. *Bobby* automatically checks sites for compatibility with HTML 4.0. For accessibility and tag compatibility with browser specifications other than HTML 4.0, use the Advanced Options."¹⁵ If all of the pages on your Web site receive a *Bobby* Approved rating, you are entitled to use one of the *Bobby* Approved icons. Just make sure that the icon contains the alternative text description "*Bobby* Approved" and that it is a link to the URL <<http://www.cast.org/bobby>>. You may download the *Bobby* Approved image

you wish to use from their Web page and place it on your own server.



CAST goes on to suggest the following:

1. Review the *Bobby* FAQ page. Some aspects of accessible Web page design cannot be tested automatically by *Bobby* yet are still important.
2. Read the document from the W3C's WAI Page Authoring working group.
3. Request feedback from visitors to your Web site.
4. Retest Web pages frequently with updated versions of *Bobby*.

Evaluation of Web Pages of North Carolina Libraries

Some library Web sites were selected to be evaluated for accessibility by the *Bobby* program. The first library page checked belonged to the State Library of North Carolina. It passed the accessibility test easily. "Congratulations! This web page contains no accessibility errors that *Bobby* can detect. There are, however, some checkpoints that an automatic program like *Bobby* cannot examine." The program then identifies items for a manual check on the Priority 2 and Priority 3 levels of the W3C guidelines.

In a check of the home pages for 48 North Carolina public libraries listed on the Web site <<http://www.publiclibraries.com/ncarol.htm>>, I found that only 10 (21%) were "*Bobby* approved"; 28 (59%) were "not yet" meeting the requirements for *Bobby* approval status. Three links were dead ends. It must be noted that only the home page was submitted for evaluation. Not only does the program check the Web page for access to the visually impaired, but it also checks for browser compatibility. These checks were performed between May 19 and June 10, 1999. For a list of the results, visit URL <<http://www.nclaonline.org/>

Libraries have been proud of their service and policy of equal access to all users. It now becomes a challenge to keep online and Internet resources equally available to all users, including those who are visually impaired.

bobby>.

The list of North Carolina community colleges on the Web was longer, and a random sampling of eight library sites yielded a slightly higher *Bobby* approval rate of 37%. One library home page provides a text or graphics option on the first page, making it easily accessible with a screen reader.

If you would like to see the complete evaluation results along with the browser compatibility errors, submit your URL to <<http://www.cast.org/bobby>>. Libraries have been proud of their service and policy of equal access to all users. It now becomes a challenge to keep online and Internet resources equally available to all users, including those who are visually impaired. As Tim Berners-Lee, W3C director and inventor of the World Wide Web, said, "The power of the Web is in its universality. Access by everyone regardless of disability is an essential aspect."¹⁶

Resources: Additional Web

References For Further Information

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⁹ W3C, "Checklist of Checkpoints for Web Content Accessibility Guidelines 1.0," <<http://www.w3.org/TR/1999/WAI-WEBCONTENT-19990505/full-checklist.html>>, (June 11, 1999).

¹⁰ WGBH Public Broadcasting from Boston <<http://www.wgbh.org/wgbh/>> (June 11, 1999)

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