Conforming to Web Site Accessibility: By Law or by Choice?

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Introduction

An issue of increasing importance among the Web development community is Web site accessibility. Until recently, a successful Web site was measured by the use of the latest features and interesting graphics on the site. The thought was that an interactive site required all the "bells and whistles" to make the site successful. Visual appeal and interactivity are still central to the issue of Web design, but many developers are beginning to take a different approach. The focus is shifting toward making Web sites accessible to all people, whatever their hardware, software, network infrastructure, native language, culture, geographical location, or physical or mental ability (W3C, 2001). This article focuses on the accessibility needs of people with physical and mental disabilities in regard to accessing Web sites.

Use of the Internet by people who have disabilities is rapidly increasing. According to a survey done by the National Center for the Dissemination of Disability Research (NCDDR), 59 percent of the individuals with disabilities who responded reported they had a computer at home, and 48 percent reported having Internet access (NCDDR, 2001a). The top reason for using the Internet by this population was searching for information and performing research. Overall, only 23 percent reported never getting information from the Internet, compared to 54 percent in 1997 (NCDDR, 2001b). Add to those statistics that the U.S. Census Bureau estimates that 70 percent of all Americans will experience some kind of disability before age 75, and it is clear that the use of the Internet by people who have disabilities will continue to rise.

The range of disabilities of Internet users who are physically and/or mentally disabled is just as wide and complex as the Web itself. Individuals may have impairments in their vision, hearing, neurological, motor, and/or cognitive abilities. There are a variety of tools that people with disabilities use to access the Internet, including screen readers, touch screens, Braille readers, screen magnifiers, special keyboards, switch interfaces, and voice input devices. These tools are not effective, though, if a Web site is developed without accessibility techniques. Non-accessible Web sites interfere with the ability of individuals with disabilities to obtain and use information quickly and easily … or at all.

Laws for Accessibility Requirements

Although there are several laws that impact accessibility issues, Section 508 of the 1998 Amendments to the Federal Rehabilitation Act, 29 U.S.C. § 794d (as revised by the Workforce Investment Act of 1998, PL. 105-220, § 408 (b)) is the most prominent law. Section 508 was enacted on June 21, 2001 to eliminate barriers in information technology, to make available new opportunities for people with disabilities, and to encourage development of technologies that will help achieve these goals. More specifically, Section 508 requires federal departments and agencies to make their electronic and information technology accessible to government employees and the public using government services. Section 508 also applies to the companies or organizations that contract with the government to develop products for federal government agencies. The standards of Section 508 define the types of technology covered and set forth provisions that establish a *minimum* level of accessibility.

Presently, state government agencies are not required to have accessible Web sites. However, the Department of Education, which is the agency responsible for administering the Assistive Technology Act (AT Act), 29 U.S.C. 3011, interprets the AT Act to require states and sub-recipients receiving assistance under the AT State Grant program to comply with Section 508, including the Access Board's standards (RESNA, 2001). In other words, recipients of federal funds under the AT Act must also comply with Section 508. However, the Department of Education does not interpret the AT Act to require compliance with the enforcement provisions, but states do have an obligation to ensure that they are meeting the substantive requirements of Section 508 (RESNA, 1999).

Section 1194.22 of subpart B within Section 508 specifically addresses Web-based Intranet and Internet information and applications, focusing on the scope and coverage of the standards. The criteria for Web-based technology and information are based on access guidelines developed by the Web Accessibility Initiative of the World Wide Web Consortium (W3C). The standards do not prohibit the use of graphics and other features that are hard or impossible to access. The aim is to ensure that inaccessible information is also available in an accessible format. There are 16 usability issues addressed in Section 1194.22. The first eleven (a-k) are consistent with the priority 1 checkpoints published by the W3C in their document, *Web Content Accessibility Guidelines 1.0 (WCAG 1.0)*, while the last five standards (l-p) are additional requirements per Section 508. These standards are as follows:

(a) A text equivalent for every non-text element shall be provided (e.g., via "alt," "longdesc," or in element content). (*WCAG 1.0* checkpoint 1.1)
(b) Equivalent alternatives for any multimedia presentation shall be synchronized with the presentation. (*WCAG 1.0* checkpoint 1.4)
(c) Web pages shall be designed so that all information conveyed with color is also available without color, for example from context or markup. (*WCAG 1.0* checkpoint 2.1)
(d) Documents shall be organized so they are readable without requiring an associated style sheet. (*WCAG 1.0* checkpoint 6.1)
(e) Redundant text links shall be provided for each active region of a server-side image map. (*WCAG 1.0* checkpoint 1.2)
(f) Client-side image maps shall be provided instead of server-side image maps except where the regions cannot be defined with an available geometric shape. (*WCAG 1.0* checkpoint 9.1)
(g) Row and column headers shall be identified for data tables. (*WCAG 1.0* checkpoint 5.1)
(h) Markup shall be used to associate data cells and header cells for data tables that have two or more logical levels of row or column headers. (*WCAG 1.0* checkpoint 5.2)
(i) Frames shall be titled with text that facilitates frame identification and navigation. (*WCAG 1.0* checkpoint 12.1)
(j) Pages shall be designed to avoid causing the screen to flicker with a frequency greater than 2 Hz and lower than 55 Hz. (*WCAG 1.0* checkpoint 7.1)
(k) A text-only page, with equivalent information or functionality, shall be provided to make a Web site comply with the provisions of this part, when compliance cannot be accomplished in any other way. The content of the text-only page shall be updated whenever the primary page changes. (*WCAG 1.0* checkpoint 11.4)
(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. (related to *WCAG 1.0* checkpoint 6.3)
(m) When a Web page requires that an applet, plug-in or other application be present on the client system to interpret page content, the page must provide a link to a plug-in or applet that complies with §1194.21(a) through (l). (Software applications and operating systems). (related to *WCAG 1.0* checkpoint 6.3)
(n) When electronic forms are designed to be completed on-line, the form 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. (related to WCAG checkpoints 9.3, 10.2, 12.4)
(o) A method shall be provided that permits users to skip repetitive navigation links. (related to a few priority 3 WCAG checkpoints)
(p) When a timed response is required, the user shall be alerted and given sufficient time to indicate more time is required. (no comparable *WCAG 1.0* checkpoint)

(29 U.S.C. 794d, Section 508, Subpart A Section 1194.22)

The World Wide Web Consortium

The Subpart B requirements of Section 508 were modeled after the guidelines of the World Wide Web Consortium's Web Accessibility Initiative (WAI). The World Wide Web Consortium (W3C), founded in 1994, is an international industry consortium jointly run by the MIT Laboratory for Computer Science (MIT LCS) in the United States, the National Institute for Research in Computer Science and Control (INRIA) in France, and the Keio University in Japan. According to the W3C (http://www.w3c.org), the Consortium's purpose is "to lead the World Wide Web to its full potential by developing common protocols that promote its evolution and ensure its interoperability." The W3C supports seven main points:

1. **universal access:** to make the Web available to all people, whatever their hardware, software, network infrastructure, native language, culture, geographical location, or physical or mental ability
2. **the semantic Web:** to enable people to solve problems and find information quickly by the use of languages that allow computers to easily interpret and exchange information
3. **trust:** to build a "Web of Trust" that offers confidentiality, instills confidence, and makes it possible for people to take responsibility and be accountable for what they publish on the Web
4. **interoperability:** to promote interoperability by designing and promoting open (non-proprietary) computer languages and protocols that avoid market fragmentation
5. **ability to evolve:** to build a Web that can easily evolve into an even better Web, without disrupting what already works
6. **decentralization:** to limit the number of central Web facilities (bottlenecks) to reduce the vulnerability of the Web as a whole

7. **"cooler" multimedia:** to work toward providing languages that would support more interactivity and richer media, without reducing accessibility

(W3C, 2001)

Accessibility Guidelines

The W3C has published *Techniques for Web Content Accessibility Guidelines 1.0 (WCAG 1.0)*, which was also used when the standards of Section 508 were created. The document can be found on the W3C Web site at http://www.w3.org/TR/WAI-WEBCONTENT-TECHS/. This document serves as a gateway to several related publications:

- *Core Techniques for Web Content Accessibility Guidelines 1.0* (accessibility themes and general techniques that apply across technologies) http://www.w3.org/TR/WCAG10-CORE-TECHS/
- *HTML Techniques for Web Content Accessibility Guidelines 1.0* (examples and strategies for creating accessible HTML content) http://www.w3.org/TR/WCAG10-HTML-TECHS/
- *CSS Techniques for Web Content Accessibility Guidelines 1.0* (examples and strategies to help Web content developers write Cascading Style Sheets as a part of accessible content design) http://www.w3.org/TR/WCAG10-CSS-TECHS/

(W3C, 1999a)

The *WCAG 1.0* document lists 14 guidelines. Each guideline contains between one and ten checkpoints. Cross-references are provided to help further explain the meaning of each checkpoint. All checkpoints must be met in order to meet the guideline.

Guideline Number	Guideline Description	Checkpoints within Guideline
1	Provide equivalent alternatives to auditory and visual content.	5
2	Do not rely on color alone.	2
3	Use markup and style sheets and do so properly.	7
4	Clarify natural language usage.	3
5	Create tables that transform gracefully.	6
6	Ensure that pages featuring new technologies transform gracefully.	5
7	Ensure user control of time-sensitive content changes.	5
8	Ensure direct accessibility of embedded user interfaces.	1
9	Design for device-independence.	5
10	Use interim solutions.	5
11	Use W3C technologies and guidelines.	4
12	Provide context and orientation information.	4
13	Provide clear navigation mechanisms.	10
14	Ensure that documents are clear and simple.	3

Each checkpoint within the guideline has a priority level assigned, based on the checkpoint's impact on accessibility. The priority levels are as follows:

- **Priority 1:** A Web content developer **must** satisfy the checkpoint since it is a basic requirement for some people to access Web documents.

  > **Example:** Checkpoint 1.1 requires that a Web site offer text equivalent information for every non-text element. A possible scenario is when a Web site posts an important message on a page, but it is stated in a graphic, and no text description (ALT tag) is offered. A person with a vision impairment will not be able to "hear" the warning because their screen reader will not be able to read the graphic.

- **Priority 2:** A Web content developer **should** satisfy the checkpoint since it will remove significant barriers to accessing Web documents.

  > **Example:** Checkpoint 13.3 requires that information about the general layout of a site should be provided, such as with a site map or table of contents. Doing so gives users different options to navigate through the site, which can make it easier for persons with cognitive, visual, or mobility impairments to access information in a linear format.

- **Priority 3:** A Web content developer **may** address the checkpoint since it will improve access to Web documents.

Example: Checkpoint 13.7 requires that different levels of searches should be offered if a search feature is provided. This allows people with varying cognitive abilities to access information easily.

(W3C, 1999a)

A helpful document to use when first reviewing the accessibility of a Web site is the *Checklist of Checkpoints for Web Content Accessibility Guidelines 1.0* which is available on-line at http://www.w3.org/TR/WCAG10/full-checklist.html. Web content developers can use this checklist as a tool to verify if their Web site is within the W3C guidelines (W3C, 1999b).

Tools for Ensuring an Accessible Web Site

There are several tools available to help a Web content developer ensure that his or her site is accessible. Once a developer has tested their site for accessibility compliance, the developer can make a conformance claim. Conformance claims are made on the honor system. Just because a Web site displays the W3C, Bobby Approved, or other accessibility assurance logo does not mean that the site is truly accessible. In addition, a site that is compliant with Section 508 does not necessarily mean it is W3C compliant and vice versa.

For example, if a Web site is WCAG conformance A compliant (all priority 1 checkpoints of the W3C are met) and wants to be Section 508 compliant, sub-sections 1194.22 (l) – (p) of Section 508 must still be fulfilled. On the flip side, if a Web site is Section 508 compliant and wants to become WCAG conformance A compliant, four additional W3C checkpoints need to be addressed.

For a comparison of the Section 508 and W3C requirements, visit http://jimthatcher.com/sidebyside.htm to view the chart, *Section 508 Web Standards and WCAG Priority 1 Checkpoints: A Side-by-Side Comparison*. The chart was created by Jim Thatcher, Vice-chair of the Electronic and Information Technology Access Advisory Committee, impaneled by the Access Board to propose standards for Section 508 (NCDDR, 2001d).

The following are some of the tools available for Web content developers to use.

World Web Consortium (W3C)

The W3C offers tools for conformance. One tool is the HTML Validation Service, found at http://validator.w3.org. This is a free service that checks documents with HTML and XHTML for conformance to W3C recommendations and other standards. Once the Web content developer has reviewed his/her site for accessibility according to the W3C guidelines, the developer can choose to add one of the W3C Web content conformance logos to their Web site. By using one of the logos, the developer is claiming conformance to a specified conformance level according to the *WCAG 1.0* document guidelines.

There are three conformance logos to choose from:

- **Level A:** all priority 1 checkpoints are satisfied (WCAG-A)
- **Level Double-A:** all priority 1 and 2 checkpoints are satisfied (WCAG-AA)
- **Level Triple-A:** all priority 1, 2, and 3 checkpoints are satisfied (WCAG-AAA)

Example of the Level Triple-A Logo

A conformance logo refers to a single page. If the claim is meant to apply to more than one page, the conformance logo must be accompanied by a detailed explanation of the scope of the claim, including an explanation of which pages are covered by the claim. The Web content developer is solely responsible for the use of these logos, so that person makes the decision as to whether the Web site is compliant, not the W3C (W3C, 2000).

Bobby Worldwide

Many Web sites display the "Bobby Approved" logo for a claim of Web site accessibility. Bobby Worldwide, first released in 1996 through the Center for Applied Special Technology (CAST), is a Web-based tool that analyzes Web pages for accessibility to people with disabilities (http://bobby.watchfire.com/bobby/html/en/index.jsp). In August 2002, Bobby Worldwide was purchased by Watchfire, a company that specializes in Web content management and accessibility solutions. The guidelines used by Bobby Worldwide are based on the W3C recommendations. It is important to remember, though, that Bobby Worldwide, as well as all other accessibility "checkers," is only one step in the process.

Bobby Worldwide also analyzes Web pages for compatibility with various browsers, based on available documentation. Bobby Worldwide automatically checks sites for compatibility with HTML 4.0. When a developer makes a request for Bobby Worldwide approval, a report is generated for the Web pages that are submitted to Bobby Worldwide. The report lists issues that were detected, listing them as priority 1, 2, or 3, according to the W3C priority

guidelines. Once the Web content developer corrects at least the priority 1 issues, the Bobby logo can be used on the Web site. All pages on the Web site must meet Bobby Worldwide requirements in order to display the Bobby Approved logo. If only a few pages on a site do not pass Bobby Worldwide, the logo can be used if one of the following is done:

1. The logo is placed only on approved pages with the text "This page is Bobby Approved."
2. The logo is placed on the home page with a list of pages that are not yet approved, preceded by the text "The pages listed below are not yet Bobby Approved."

Single pages can be tested on the Bobby Worldwide Web site at no charge, although the number of pages that can be tested are limited in order to keep site traffic manageable. To test multiple pages, Bobby Worldwide suggests purchasing the downloadable version of Bobby Worldwide for $99. Pricing for a site license is also available.

A-Prompt
A-Prompt (Accessibility Prompt) is a software tool designed to improve the usability of HTML documents by evaluating Web pages for accessibility barriers and then providing developers with a fast and easy way to make the necessary repairs. The tool's evaluation and repair checklist is based on accessibility guidelines created and maintained by the W3C. Visit http://aprompt.snow.utoronto.ca for more information.

Wave
Pennsylvania's Initiative on Assistive Technology (PIAT) offers an on-line program to check pages for accessibility. Pages are tested one at a time and results are displayed immediately. The program uses some of the techniques from initiatives from the WAI, but does not claim to be endorsed by the W3C. This tool is good for performing a quick check of a Web page.

The Response from the Private Industry

Already there are organizations that are advocating for better Internet accessibility. The Information Technology Technical Assistance and Training Center (ITTATC) in Atlanta, Georgia (http://www.ittatc.org) believes that by influencing industry and state level practices, there will be positive change in the ability to design accessible products and services. One of the ways that ITTATC seeks to encourage this is by documenting "successful approaches for achieving accessible E&IT [electronic and information technology] products and services that are accessible to and usable by a broad range of people with disabilities" (NCDDR, 2001c).

The private industry is starting to take notice of the importance of accessibility issues. Even though the present law under Section 508 impacts only the federal government, there is a trickle-down effect to private organizations. Companies who provide products for government contracts stand to lose their business if their products are not accessible or useful for creating accessible Web sites and documents. The trend to create and revise products to have built-in accessibility features is becoming more prevalent. Many companies have implemented formal accessibility initiatives and testing processes. Some examples of initiatives taken by the private industry include:

- Adobe (http://access.adobe.com) or (http://www.adobe.com/products/acrobat/solutionsacc.html)
- Adobe: Advanced Techniques for Creating Accessible Adobe PDF Files (http://www.adobe.com/products/acrobat/pdfs/CreateAccessibleAdvanced.pdf)
- Hewlett Packard (http://www.hp.com/hpinfo/community/accessibility/)
- IBM (http://www-3.ibm.com/able/)
- Macromedia (http://www.macromedia.com/macromedia/accessibility/)
- MicroSoft (http://www.microsoft.com/enable/)

The Role of the Technical Communicator

Just because a Web site is accessible does not mean it is usable. Conforming to Section 508 and/or the W3C guidelines is just one step in the accessibility process. Web site accessibility goes beyond the technology components described in these standards and guidelines. Usability – the human quotient – also needs to be addressed, such as the effective use of navigation techniques and content development. And a Web site that is deemed accessible does not mean it has to be boring. With the use of proper techniques and attention to detail, a fully accessible Web site can be useful and attractive. This is where the role of a technical communicator comes in. Through knowledge of Web site accessibility requirements and the skills that a technical communicator already possesses, such as usability testing and analysis, writing for specific audiences, and navigation and organizational techniques, a technical communicator can be an extremely valuable commodity for an employer.

Design for All

Recognizing the issues of Web site accessibility is just the beginning. Paying serious attention to these issues and proactively taking action are the next steps. The passage of Section 508 is promising on the federal level, but state governments and the private industry need to take action, too. With the resources and tools that organizations such as the W3C offers, being proactive about Web accessibility is made easy. Keep in mind that it is much easier to work on making a site accessible over a period of time rather than hurrying to conform at the last moment because a new law mandates an agency or company to do so.

The old saying, “What goes around, comes around” applies to Web site development. When the general public started using the Internet more than a decade ago, the Web sites were text-based and created mainly for the dissemination of information. Then the Internet grew by leaps and bounds, along with the technology to support it. But the growth produced some results that were not anticipated; the growth in technology actually started to prohibit certain populations from being able to access the Internet. Instead of making information easier to access, the opposite happened, particularly to the disability community. Even people without disabilities have begun to avoid Web sites that are difficult to navigate or download. Additionally, the use of new technology for Internet access, such as mobile phones, palm-tops, Web TV, and information kiosks, demands the development of accessible Web sites since that technology cannot and is not expected to support graphics and certain multi-media. So, we have come back full-circle to the beginning: making Web sites simple and easy to access. This benefits all users, especially users with disabilities. Simply put: better accessibility means better usability – for all.

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NCDDR. (2001d). Section 508 Web standards and WCAG priority 1 checkpoints: a side-by-side comparison, *Special Supplement for The Research Exchange*, Vol. 6., No. 3 http://www.ncddr.org/du/researchexchange/v06n03/infotech.html

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Training and Resources

Suggested Reading

Designing Web Usability, New Riders Publishing (2000)
Web Accessibility for People with Disabilities, CMP Media, Inc. (2000)

Suggested Resource Links		
The ADA Information Center for the Mid-Atlantic Region	http://www.adainfo.org	Training, information, and technical assistance on the Americans with Disabilities Act (ADA).
Center for Applied Special Technology (CAST) – Bobby Approval service	http://www.cast.org/bobby/	Accessibility testing tool for Web content developers.
Illinois Center for Instructional Technology Accessibility	http://cita.rehab.uiuc.edu	Comprehensive information and on-line classes about accessibility.
The Information Technology Technical Assistance and Training Center (ITTATC)	http://www.ittatc.org	Organization that promotes the development of accessible electronic and information technology.
International Webmasters Association	http://www.iwaguild.com	International organization that offers on-line Web development classes on Web design, including accessible Web design.
Rehabilitation Engineering and Assistive Technology Society of North American (RESNA) – Technical Assistance Project	http://www.resna.org/taproject	Comprehensive information about Section 508 of the Federal Rehabilitation Act.
Section 508: The Road to Accessibility	http://www.section508.gov	Government site about Section 508 of the Federal Rehabilitation Act.
The Society for Technical Communication's Special Needs SIG	http://www.stcsig.org/sn/index.shtml	Information for technical communicators with special needs, including a section on Internet accessibility.
Trace Research & Development Center	http://www.trace.wisc.edu/world/web/index.html	Comprehensive listing of links to information, such as guidelines, tools, projects, and forums.
W3Schools.com	http://www.w3schools.com	Free Web building tutorials, including tutorials about the W3C.
Web Accessibility Initiative	http://www.w3.org/WAI/	Initiative of the World Wide Web Consortium
WebAIM	http://www.webaim.org	Information and support, including a screen reader simulation.