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Despite the widespread availability of Web-based information resources, it is difficult for some people who rely on assistive technology to access and process these materials. Web designers can play an active role in facilitating access by formatting resources so that they are compatible with these technologies. This can be accomplished by following the accessibility guidelines outlined by the World Wide Web Consortium Web Accessibility Initiative.

Web resources that have been created following these guidelines are compliant with the Americans with Disabilities Act (ADA), Public Law 102-569, Section 508 of the

Rehabilitation Act (Waddell, C. D., 1998); the Assistive Technology Act of 1998 (S.2432); and Section 255 of the Telecommunications Act.

This Digest is written primarily for Web developers, information professionals, and others who are interested in Web accessibility. It provides a brief overview of accessibility challenges and some basic Hypertext Markup Language version 4.0 (HTML 4.0) coding solutions for these challenges, and provides an introduction to some of the legal requirements and considerations for Web accessibility.

WEB DESIGNERS' TECHNNIQUES

The World Wide Web Consortium (W3C) actively formulates World Wide Web policy and structure and oversees the Web Accessibility Initiative (WAI). The Web Accessibility Initiative is responsible for making Web formats compatible with assistive technologies. Adherence to these Web accessibility guidelines ensures that Web-based materials are 'universally' accessible (Reagan, 1997), without sacrificing visual appeal or higher-end features and functionality (Waddell, 1998).
Web architects can ensure accessibility by using special HTML coding techniques and offering alternative versions of pages and sites. Consideration should be given to users who are accessing Web-based resources using visual, auditory, or mobility assistive technologies.

The following items summarize the most common HTML coding and Web design techniques for accessible Web design (Peters-Walters, 1998).

---Inclusion of ALT (alternative) and/or LONGDES (long description) HTML tags and text in graphics and imagemaps provides access to people using visual assistive technologies or a text-based browser such as Lynx. The ALT tag provides a brief textual label for graphics and hot spots on imagemaps. The LONGDES tag provides a more-detailed explanation of the contents and context of graphical information. Without these alternative tags, screen readers and dynamic Braille generators/synthesizers would output the nondescript label "image" or "graphic."

---Audio or video clips that include closed captioning and/or descriptive text facilitate access for users who are viewing a Web resource via auditory assistive technology.

---Alternative navigation and keyboard commands provide access for users who are using mobility assistive technologies or who have difficulty manipulating a mouse or

keyboard.

---Designers should offer frames and no-frames, low-end graphics, and text-only versions of their sites.

---Background, text, and graphics colors should be carefully chosen to allow for people with color blindness.

---Page layout and design should be neither flashy nor cluttered and text should be broken into smaller parts to increase readability (Peters-Walters, 1998). The basic rule of accessible Web design is to keep it simple and offer alternative formats and views in order to meet the needs and interests of the widest possible audience (Reagan, 1997). By following the W3C's accessibility guidelines and incorporating special HTML coding, Web designers can create Web resources that are 'universally' accessible (1997), and have built-in accessibility that allows access, even when assistive technologies are not available (Peters-Walters, 1998).

Once coding is complete, HTML and accessibility validation software such as Bobby (Center for Applied Special Technology) can be used to detect errors in coding and problems with accessibility. Pages can also be viewed using Lynx, Lynx Viewer, or other text-based browsers.

The practice of accessible Web design is strongly recommended and is becoming mandatory through recent legislation and legislative updates. By implementing the procedures outlined above, Web designers can ensure that their Web-based materials are 'universally' accessible (Reagan) and that they are compliant with the Americans with Disabilities Act (ADA) and other relevant legislation (Waddell, 1998).

THE LEGAL MANDATE FOR ACCESSIBLE WEB DESIGN

Web developers should be aware of the following three legislative acts: "The Americans with Disabilities Act (ADA), Public Law 102-569, Section 508." The ADA's Rehabilitation Act is the principal legislation that is driving this trend toward mandatory accessible Web design. Americans with Disabilities Act legislation is especially important for designers of education Web sites that are hosted or sponsored by a government, educational, or not-for-profit agency.

"The Assistive Technology Act of 1998" includes provisions for the development, funding, and availability of assistive technologies, and the dissemination of information regarding these technologies. This act is important to Web developers because the potential for an increase in end users who are accessing Web-based materials using assistive technologies means an increased need for accessible Web design (and the increased opportunity for Web architects to incorporate the principles of accessible Web design).

"Telecommunications Act." The final guidelines concerning the accessibility, usability, and compatibility of telecommunications equipment covered by Section 255 of the Telecommunications Act were issued by the Federal Communications Commission Access Board on February 3, 1998. Web developers need to be aware of this legislation if they are designing Web-based resources for a government, educational, or not-for-profit organization.

RESOURCES CITED

Americans with Disabilities Act (ADA), Public Law 102-569, Section 508 of the Rehabilitation Act: http://www.usdoj.gov/crt/508/deptofed.html
Assistive Technology Act of 1998 (S.2432): http://www.itpolicy.gsa.gov/cita/AT1998.htm

Center for Accessible Technology's (CAST) Bobby accessibility validation software: http://www.cast.org/bobby

HTML 4.0 - World Wide Web Consortium HyperText Markup Language Web Page: http://www.w3.org/MarkUP/

Lynx Viewer: http://www.delorie.com/web/lynxview.html

Peters-Walters. S. (May/June, 1998). Accessible web site design. Teaching Exceptional Children (TEC online), 30(5). (Available online at: http://www.nscee.edu/unlv/Colleges/Education/ERC/tec.html) 1. Click on: Contents, 2. Scroll down the Web page and click on: Accessible Web Site Design Stacy Peters-Walters (Note: This article is available in HTML and PDF [portable document formats].)

Reagan, M.J. (1997). An accent on access: Writing HTML for the widest possible audience. Paper presented at "The Universe at Your Fingertips: Continuing Web Education." Conference Sponsored by the Librarians Association of the University of California, Santa Barbara, Friends of the UCSB Library, and the Black Gold Cooperative Library System Reference Committee (Santa Barbara, CA, April 25, 1997). 11pp. (Electronic version: http://www.library.ucsb.edu/universe/reagan.html) (ED 412 905)

Telecommunications Act, Section 255. Access by persons with disabilities.

http://www.fcc.gov/dtf/fcc98055/appenda.html

Waddell, C. D. (1998). Applying the ADA to the Internet: A web accessibility standard. (Conference paper written and presented on June 17, 1998 at the request of the American Bar Association for their National Conference "In Pursuit: A Blueprint for Disability Law and Policy".) (Available online at http://www.rit.edu:80/~easi/law/Weblaw1.htm).

Web Accessibility Initiative (WAI): http://www.w3.org/WAI/

World Wide Web Consortium (W3C): http://www.w3.org/

WEB RESOURCES

Burstein, C. D. (June 8, 1998). Viewable with any browser: Campaign for a non-browser specific WWW. [Available online at http://www.anybrowser.org/campaign/].Includes discussion of accessible Web design that is interoperable, or platform- and browser-independent. Includes links to many related resources.

Center for Applied Special Technology (CAST). http://www.cast.org

Center for Information Technology Accommodation (CITA) Supports the activities of the World Wide Web Consortium and Council on Accessible Technology http://www.itpolicy.gsa.gov/cita/

DO-IT (Disabilities, Opportunities, Internetworking, and Technology). Helps people with disabilities successfully pursue academics and careers and sponsors programs that promote the use of technology that is designed to enhance the participation, productivity, and independence of people with disabilities. The DO-IT site includes many links to Web development and accessibility resources. http://www.washington.edu/doit/

EASI (Equal Access to Software and Information). Includes links to adaptive resources, Web design, and legislation. http: www.rit.edu:80/~easi/

ERIC Clearinghouse on Disabilities and Gifted Education. (ERIC/EC) Includes links to resources on assistive technology and other disability-related information. http://ericec.org

ERIC Clearinghouse on Information & Technology (ERIC/IR). Includes links to resources on information technology, educational technology, and library and information science. http://ericir.syr.edu/ithome

WebABLE. Database of information for both people with disabilities and those who are responsible for accessible Web design. http://www.Webable.com/

ERIC AND OTHER CITATIONS

Assistive devices for use with personal computers. Reference Circular No. 98-01. Library of Congress, Washington, DC., National Library Service for the Blind and Physically Handicapped (1998). 39pp. (ED 420 140)

Burgstahler, S.; Comden, D.; & Fraser, B. (December, 1997). Universal design for universal access: Making the Internet more accessible for people with disabilities. ALKI, 13(3), p.8-9. (EJ 559 756).

Casey, C. A. (March, 1999). Accessibility in the virtual library: creating equal opportunity Web sites. (for people with disabilities). Information Technology and Libraries, 18(1), p.22-25.

ELECTRONIC DISCUSSION GROUPS

ABLETECH-L-Discussion forum for parents, teachers, and others concerned with disabilities and assistive technology. Subscription address: listserv@listserv.okstate.edu subscribe ABLETECH-L Your First Name Your Last Name

ADAPT-L-Discussion forum for the use of adaptive technology in libraries. Subscription address: listserv@american.edu subscribe ADAPT-L Your First Name Your Last Name

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