

Web Accessibility: What It Is and How to Do It

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What is Web Accessibility?

- Access to the Web by everyone, regardless of disability.
- Make sure your Web info is accessible to EVERYONE regardless of software, platform, and abilities...
- Accessible design is good design and benefits everyone, not just people who have disabilities.

"The power of the Web is in its universality. Access by everyone regardless of disability is an essential aspect."

Tim Berners-Lee
W3C Director and inventor of the Web

Why Accessibility?

- A student who is blind may not be able to interpret graphics.
- A student who has a hearing impairment may not be able to hear sounds from audio clips.
- Students who have learning disabilities or limited vision may have difficulty navigating online material that is cluttered or poorly organized.
- An individual with a mobility impairment may not be able to fill out a Web-based form if it is not keyboard accessible.
- Learners who have seizure disorders might not be able to view flickering presentations safely.

Source: UMCU. Accessibility in Distance Education. <http://www.umuc.edu/ade/wia/benefits.html/>

Student Experiences with Web Accessibility

- 11.5 minutes video produced by WebAim
- <http://www.webaim.org/info/asdvideo/>
- Overview of the difficulties user's with disabilities face on the Web and some of the motivations for Web accessibility



Source: UMCU. Accessibility in Distance Education. <http://www.umuc.edu/ade/wia/benefits.html/>

Statistics on Disabilities

- 20% of all U.S. citizens have some kind of disability.
- 1 in 2 Americans 65 and older has a disability.
- Nearly 30% of all families in the U.S. are affected by a member who has a disability.
- People with disabilities boast a population of 54 million and have discretionary income of more than \$175 billion – that's nearly twice the buying power of the teen market.

Source: Web Accessibility Facts & Figures. <http://www.wright.edu/web/access/information.html>

Types of Disability

- Visual
 - Blindness, low vision, color-blindness (red/green, blue/yellow, no color perception)
- Hearing
 - Deafness
- Motor
 - Inability to use mouse, slow response time, limited fine motion control
- Cognitive
 - Learning disabilities, distractibility, inability to remember or focus on large amounts of information
- Neurological
 - Seizure Disorder. Stimulated by quick movements such as animations, causing seizures.

WebAim 2002 Study

- A nationwide sample of 144 K-12 education sites, resulted in only 6% accessibility approval when analyzed against minimal accessibility requirements.

Why Designing Accessible Web Sites?

- Morally and ethically it is not right to exclude those 20 percent of the American population who have a disability.
- Economically, we support individuals with disabilities through public and private assistance programs.
- Legally, secondary and postsecondary schools are compelled to provide reasonable accommodations for individuals with disabilities through a number of laws enacted by U.S. Congress.

Accessible Web Site

An "accessible Web site" will successfully communicate its information to anyone despite physical, sensory and cognitive disabilities or whatever the browsing device or adaptive technology being used.

Accessibility as a Legal Issue

- Many countries have legislations or policies related to Web accessibility
 - Australia - Disability Discrimination Act, 1992
 - U.S. - Amendment to the Rehabilitation Act, 1998
 - France - Mission pour les Technologies de l'Information et de la Communication (MTIC), 1999
 - Canada - Common Look and Feel for the Internet, 2000
 - Belgium, Denmark, Finland, Germany, Greece, Ireland, Italy, Netherlands, Portugal, Spain, Sweden, UK, Japan, Singapore, New Zealand adopted Web Accessibility Initiative

Laws

Section 504 of the Rehabilitation Act

- Passed in 1973
- Establishes that disability rights are a form of civil rights and therefore covered by the 14th Amendment of the U.S. constitution.
- Mandates that institutions receiving federal funds provide equal access to their programs.

Laws

The Americans with Disabilities Act of 1990

- Applies the same general principle as Section 504 for equal opportunity to participate in programs and services, but it extends the reach to private organizations and any state or local entities not covered under Section 504.
- Requires that every institution receiving federal funds establish and maintain a plan of compliance.

Laws

Section 255 of the 1996 Telecommunications Act

- Requires that telecommunication services and products are accessible.
- ADA will cover government entities on the Internet as well as those providers whose services are deemed to be "public accommodations."

Laws

Section 508, the 1998 amendment of the Rehabilitation Act

- Requires that federal agencies make their electronic and information technology accessible to all people, including those with disabilities.
- Though Section 508 does not directly apply to universities, it mandates specific conditions for Internet and Web accessibility that are used as guidelines in designing and creating Web sites for federal agencies.

Laws

Section 508, the 1998 amendment of the Rehabilitation Act (Continued)

- Provides accessibility standards, developed by the Architectural and Transportation Barriers Compliance Board (Access Board), for the Web and many other areas of electronic and information technology.
- Standards for Web pages were published on December 21, 2000.
- Enforcement date was set at June 21, 2001.

Lawsuits

Lawsuits were settled out of court in favor of the disabled community:

- City of San Jose, 1995
- Sydney Organizing Committee for the Olympic Games, June 1999
- America Online (AOL), Nov 1999
- Bank of America, March 2000
- Connecticut Attorney General's Office, April 2000

Source: Web Accessibility Facts & Figures. <http://www.wright.edu/web/access/laws.html>

Web Accessibility Issues

Visual Barriers - Blind

- Unlabeled graphics, undescribed video
- Poorly marked-up tables or frames
- Lack of support for keyboard-only access
- Tables that do not make sense when read serially (in a cell by cell mode)
- Frames that do not have "NOFRAME" alternative, or that do not have meaningful names
- Forms that cannot be tabbed through in a logical sequence
- Screen reader incompatibilities

Source: Holbach, B., Brackett, H., Oliver, K., & Snider, R. [Web Accessibility](#)

Web Accessibility Issues

Visual Barriers – Low Vision

- Web pages with absolute font size that do not change easily
- Web pages that, because of inconsistent layout, are difficult to navigate when enlarged due to loss of surrounding context
- Web pages or images, that have poor contrast, and whose contrast cannot be easily changed through user override of authors' style sheets

Source: www.monash.edu.au

Web Accessibility Issues

Visual Barriers – Color Blind

- Meaning that is conveyed by color alone
- Color that is used as a unique marker to emphasize text on a Web site
- Text that inadequately contrasts with background color or patterns
- Web browsers that do not support user override of authors' style sheets

Source: www.monash.edu.au

Web Accessibility Issues

Hearing Barriers

- Lack of captions or transcripts for audio content
- Auditory prompts without visual signposts
- Use of long sentences, uncommon or sophisticated vocabulary
- Lack of content-related images in pages full of text, which can slow comprehension for people whose first language may be a sign language instead of a written/spoken language

Source: Holbach, B., Brackett, H., Oliver, K., & Snider, R. [Web Accessibility](#)

Web Accessibility Issues

Physical Access Barriers

- Lack of alternatives for input / navigation (for example, voice recognition or eye-gaze)
- Unsupported single-switch menu commands
- Time-limited response options on Web pages
- Navigation that cannot be jumped over
- Forms that cannot be tabbed through in a logical order
- Browsers that do not support keyboard alternatives for mouse commands

Source: Holbach, B., Brackett, H., Oliver, K., & Snider, R. [Web Accessibility](#)

Web Accessibility Issues

Cognitive or Neurological Barriers

- Inconsistent navigational structures
- Overly complex presentation or language
- Lack of illustrative non-text materials
- Distracting graphics and text movement
- Use of blinking text
- Use of flickering animations
- Use of audio frequencies that can trigger seizures
- Use of unnecessary complex language

Source: Holbach, B., Brackett, H., Oliver, K., & Snider, R. [Web Accessibility](#)

Assistive Technologies

- Visual
 - Screen readers – JAWS, IBM Home Page Reader, and Windows Eyes
 - Voice browsers - Genesys Voice Platform and VoiceXML,
 - Magnification technology – ZoomText, Closeview, MAGie, Lunar
- Hearing
 - Captioning of audio and video – OpenBook and Write-OutLoud

Assistive Technologies

- Motor
 - Head switch, head wand, voice recognition, iris recognition, mouth stick, and trackball - Braille, ORB, adaptive keyboards
- Cognitive
 - turn off animated graphics and background sounds, captioning, text-to-speech reader

Inclusive Design

- The Web Content Accessibility Guidelines (WCAG) notes that many users may be operating in contexts very different from the designer's context:
 - They may not be able to see, hear, move, or may not be able to process some types of information easily or at all.
 - They may have difficult reading or comprehending text.
 - They may not have or be able to use a keyboard or mouse.
 - They may have a text-only screen, a small screen, or a slow Internet connection.
 - They may not speak or adequately understand the language in which the document is written.
 - They may be in a situation where their eyes, ears, or hands are busy or interfered with.
 - They may have an early version of a browser, a different browser entirely, a voice browser, or a different operating system.

Source: W3C Web Accessibility Initiative (WAI) Web Accessibility Content Guidelines (WCAG) 1.0


Reasons to Provide Accessible Web Sites

- Compliance with regulatory and legal requirements
- Exposure to more people – people with disabilities and seniors
- Better design and implementation
- Cost savings
- Boosting your reputation


How To Do It?

- Follow accessibility standards.
- Test your pages using accessibility validation software or tools.
- Create a committee that:
 - develops guidelines for accessibility on your campus;
 - creates and implements a plan for compliance;
 - creates and implements a plan for education.
- Create an online "master" checklist to test pages for accessibility and policy guidelines.

Accessibility Standards



- Web Content Accessibility Guidelines - an international voluntary standard


www.section508.gov

- Section 508, a U.S. legislative mandate for Electronic and Information Technology Accessibility Standards

Web Accessibility Initiative **Web Content Accessibility Guidelines 1.0 (WCAG)**

- A part of Web Access Initiative (WAI) established in 1999 by W3C to promote and achieve Web functionality for people with disabilities.
- Consist of 14 guidelines, each with 3 priority checkpoint levels for Web developers to meet.
- 65 checkpoints in all 3 priorities.
- Section 508 is based on WCAG 1.0 Priority 1.
- Australia, France, Italy, and Japan have adopted or in the process of implementation WCAG 1.0.

Section 508 - Electronic and Information Technology Accessibility Standards

- Published by the US Architectural and Transportation Barriers Compliance Board (Access Board) in 2000.
- Section 508 requires the Access Board to publish standards setting forth a definition of electronic and information technology and the technical and functional performance criteria necessary for such technology to comply with Section 508.
- 16 provisions of the Section 508 standards for Web-based intranet and internet information and applications which provide the requirements that must be followed by Federal agencies when producing Web pages.
- A majority of the Web Section 508 rules are based on Priority Level 1 of the W3C WCAG 1.0 with minor changes for regulatory wording.

W3C Quick Tips to Accessible Design by W3C

- **Images and animations**
 - Use Alt tags to provide the information about the image.
 - Alt text can be read by a screen reader that tells the blind user about the image.

W3C Quick Tips to Accessible Design by W3C

- **Image Maps**
 - Use client-side map and text for hotspots.
 - Always include a text alternative to the image map since some browsers do not support image maps.

W3C Quick Tips to Accessible Design by W3C

- **Multimedia**
 - Provide captioning and transcripts of audio and descriptions of video
 - Deaf users will need video be captioned and other audio be transcribed.

W3C Quick Tips to Accessible Design by W3C

- **Hypertext links**
 - Use text that makes sense when read out of context.
 - Avoid non-descriptive hyperlinks such as "click here".
 - Choose colors for the links and text carefully.

W3C Quick Tips to Accessible Design by W3C

- **Page organization**
 - Use headings, lists, and consistent structure.
 - Use CSS (cascading style sheets) for layout and style where possible.
 - Build the same look and feel for navigation wherever possible.

W3C Quick Tips to Accessible Design by W3C

- **Graphs and charts**
 - Summarize or use the longdesc attribute.
 - A long description can be used for graphs and charts requiring alt text longer than 50 characters.
 - Graphs can be confusing to many disable users. A text summary can be helpful.

W3C Quick Tips to Accessible Design by W3C

- **Scripts, applets, and plug-ins**
 - Provide alternative content for scripts, applets, and plug-ins.
 - Older browsers have problems with some scripts, applets, and plug-ins.

W3C Quick Tips to Accessible Design by W3C

- **Frames**
 - Use the noframes option or title your frame
 - Some screen readers have difficulty distinguishing between frames.

W3C Quick Tips to Accessible Design by W3C

- **Tables**
 - Make column by column reading sensible.
 - Avoid using tables for column layout.
 - Most screen readers can only read left to right across each row on the screen, and tables can be very confusing.

W3C Quick Tips to Accessible Design by W3C

- **Check your work**
 - Validate the HTML.
 - Use evaluation tools to verify accessibility and ease of use.

Tips for Designing Accessible Web Pages

- **General Page Design**
 - Maintain a simple, consistent page layout throughout your Web site.
 - Keep page background simple.
 - Use standard HTML.
 - Make links descriptive so that they are understood out of context.
 - Use frames sparingly and consider alternatives.
 - Provide an access instruction page for visitors and explain the accessibility features of the Web site.
 - Create a Web page that has a flexible design.
 - A Web page degrades gracefully if it can still be used without JavaScript, frames, and multimedia.

Tips for Designing Accessible Web Pages

- **Navigation**
 - Design logical, usable, and consistent navigation menus.
 - Use consistent headings and titles throughout the site.
 - Name icons and files meaningfully by using simple and direct language.
 - Provide support for text browsers and descriptive hyperlinks.

Tips for Designing Accessible Web Pages

- **Color**
 - Use high contrasting colors.
 - Color should not be the only means of conveying important information. Consider other alternatives.
 - Allow users to adapt color with the browser preferences.
 - Visit the Vischeck [www.vischeck.com] to check what a color blind person would see on a Web page.

Tips for Designing Accessible Web Pages

- **Fonts**
 - Fonts should be easy to read. Use sans serif fonts such as Arial, Helvetica, Comic Sans, and Tahoma.
 - Avoid `<BLINK>...</BLINK>` and `` tags.
 - Clear definable letter shapes, clear spacing between letter combinations.
 - Use a minimum of text size 12pt or 14pt.
 - Avoid underlining except for hyperlinks.
 - Use bold for emphasis.

Tips for Designing Accessible Web Pages

- **Readability**
 - Use short simple sentences and avoid long sentences of explanation.
 - Give clear instructions.
 - Use concise paragraphs with clear topic headings.
 - Use bullet points or numbering for lists.
 - Use graphics to explain complex text.
 - Consider short pages to reduce the need to scroll.

Tips for Designing Accessible Web Pages

- **Multimedia**
 - Include appropriate ALT/LONGDESC attributes for graphical elements on your page.
 - Use a NULL value for unimportant graphics.
 - Include descriptive captions or other options for making graphical features accessible.
 - Provide **captioning** and transcripts for audio and video clips.
 - Provide alternatives for content in applets and plug-ins.
 - Provide meaningful alternatives for learners who cannot access certain media formats.


Tips for Designing Accessible Web Pages

- **Forms**
 - Provide alternatives for forms and databases. Some combinations of browsers and screen readers encounter errors with non-standard or complex forms.
 - Always test forms and databases with a text-based browser.

Tips for Designing Accessible Web Pages

- **Others**
 - Provide several alternative formats of the same documents.
 - Include notes that describe how to handle downloadable files.
 - Provide an accessible alternative or a d-link to describe the content of a Flash file since Flash is accessible to only a few screen readers.
 - Make Acrobat PDF files, Microsoft Word and PowerPoint files accessible.
 - Convert PDF files to accessible HTML or Word RTF file.
 - Create a text outline version of PowerPoint by saving the presentation as Outline/RTF.

Validation Tools


508 Accessibility Suite 

- A free extension to Macromedia Dreamweaver.
- http://www.usablenet.com/frontend/508as_entry.jsp
- Has comprehensive tools for testing Web sites and making them accessible according to W3C WCAG 1.0, priority 1 and priority 2.

Validation Tools

Online Validation Tools


- W3C [validator.w3.org]
- WebXACT [webxact.watchfire.com]
- LIFT Online [www.usablenet.com]
- WAVE [www.wave.webaim.org]




Web Accessibility Tools

Web Accessibility Toolbar

- <http://www.nils.org.au/ais/web/resources/toolbar/>
- Provided by the Accessible Information Solutions (AIS) team at the National Information and Library Service (NILS), Australia
- Aid manual examination of Web pages for a variety of aspects of accessibility



Web Accessibility Tools

A-Prompt 

- Web Accessibility Verifier
- <http://aprompt.snow.utoronto.ca>
- Free software
- Examines Web pages for barriers to accessibility, performs automatic repairs when possible, and assists the author in manual repairs when necessary

Web Accessibility Tools

InFocus Desktop

- <http://www.ssbtechnologies.com/products/infocus/>
- Automates the process of finding and fixing accessibility violations in Web sites and Web applications



Web Accessibility Tools

Vischeck

- Color checker
- <http://www.vischeck.com>
- Show you what things look like to someone who is color blind.
- Can run Vischeck on your own image files or on a Web page.

Web Accessibility Tools

Fangs - Screen Reader Emulator

- <http://sourceforge.net/projects/fangs>
- A Mozilla Firefox extension that displays a text representation of a Web page similar to how a screen reader would read it.
- Help Web developers finding accessibility issues at an early stage.

Web Accessibility Tools

IBM Home Page Reader

- http://www-306.ibm.com/able/solution_offerings/hpr.html
- Read Web pages, the Windows desktop and selected applications
- Incorporate features for low vision, such as magnification and highlighting
- Assist Web developers in testing for accessibility
- Support Adobe PDF and Macromedia Flash content

Web Accessibility Tools

Accessible Web Publishing Wizard for Microsoft Office

- <http://cita.disability.uiuc.edu/software/office/>
- Convert Microsoft Office documents to accessible HTML formats.

Web Accessibility Tools

Adobe® PDF to HTML Converter

- Convert an Adobe® Portable Document Format (PDF) file to HTML or text
- http://www.adobe.com/products/acrobat/access_onlinetools.html

Web Accessibility Tools

Media Access Generator (MAGpie)

- <http://ncam.wgbh.org/webaccess/magpie/>
- Create captions and audio descriptions for rich media



Web Accessibility Tools

Hi-Caption

- <http://www.hisoftware.com/hmcc/acc4mcc.html>
- Create captioning for multimedia productions



Resources

- Electronic and Information Technology Accessibility Standards
www.access-board.gov/sec508/standards.htm
- W3C/WCAG Accessibility Suite
www.usablenet.com
- WebABLE
www.webable.com
- WebAim
www.webaim.org
- Web Content Accessibility Guidelines 1.0
www.w3.org/TR/WAI-WEBCONTENT/

THE END

Questions or Comments?

Thank You for Attending My Workshop!