Designing An Accessible Web

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The Accessibility Problem

With the World Wide Web playing an increasingly important role in providing recreational, educational, governmental, and commercial resources, the concern for making the Web truly accessible to all users has become more critical. The multimedia nature of the Web and the speedy revolutions of browser and other Web-related technologies have greatly empowered million of users, but many users cannot utilize the full range of Web resources due to accessibility problems. Many of the problems with access persist, not because they are unsolvable, but because Web designers have not paid due attention to the issue of accessibility and the technologies already available to overcome the barriers. In order to make the Web truly accessible, Web designers need to know accessibility problems and implement solutions for accessible design.

Who is affected?

Accessibility concerns a large number of people. Some users have learning disabilities, speak English as a second language, or are younger than the average user. These people may have difficulty navigating sites that are poorly designed with unclear directions. Even the "average" user may have encountered problems in accessing Web content. For example, some users use slow connections and modems or older equipment that cannot download large files.

For users with various disabilities, accessibility is even more of an important issue. According to various national and government surveys, nearly 50 million people (nearly 20 percent of the population) in the United States have either a severe or functional disability, as many as 500 million people have disabilities worldwide, and about 8 percent of Americans who use the Web have a disability. It is important to note that while many people are born with a disability, others may become part of the disabled population because of aging, accidents, or diseases. These changes may be temporary or permanent.

Generally, Web access is limited by five types of disabilities. Note that each impairment requires unique design considerations, which will not be detailed here but for which resources will be given later.

- Visual Impairments

Visual impairments include dimness, haziness, extreme far-sightedness or near-sightedness, color blindness, tunnel vision, and blindness. Instead of using a monitor or mouse, blind users employ a screen reader, which translates text into speech. Because a screen reader cannot interpret the graphical content of images, alternative tags, or "ALT" tags, are used to allow users to hear the alternative text about the images. For people who have low vision, text size and color can make a big difference.

- Hearing Impairments

Like visual impairments, hearing impairments also cover a wide range, from being able to hear some sound, but not being able to distinguish words, to not being able to hear at all. The most obvious solution is synchronized captioning and/or transcripts for all aurally imparted information.

- Mobility impairments

A variety of diseases can cause mobility impairments: arthritis, stroke, cerebral palsy, Parkinson's disease, multiple sclerosis, and loss of limbs or digits. These conditions make using standard keyboards and mouse devices difficult.

- Cognitive and language impairments

This category consists of dyslexia, difficulties remembering, solving problems, or perceiving sensory information, problems comprehending and using language. For people with these impairments, complex or inconsistent displays or word choice can add to the difficulty of accessing and comprehending Web content.

- Seizure disorders

Some susceptible individuals can be induced into seizures with elements that flicker between 2 Hz and 55 Hz.

The Web Accessibility Initiative

Fortunately, there are techniques to overcome the limitations faced by users with disabilities. As early as in 1997, the Web Accessibility Initiative (WAI) was launched, pointing an important directive of the World Wide Web Consortium (W3C). WAI has published a series of accessibility guidelines, including "Web Content Accessibility Guidelines 1.0", User Agent Accessibility Guidelines, and Authoring Tool Accessibility Guidelines. The Web Content Accessibility Guidelines 1.0 "discuss accessibility issues and provide accessible design solutions" in 14 areas:

1. Provide equivalent alternatives to auditory and visual content.
2. Don't rely on color alone.

3. Use markup and style sheets and do so properly.
4. Clarify natural language usage.
5. Create table that transform gracefully.
6. Ensue that pages featuring new technologies transform gracefully.
7. Ensure user control of time-sensitive content changes.
8. Ensure direct accessibility of embedded user interfaces.
9. Design for device-independence.
10. Use interim solutions.
11. Use W3C technologies.
12. Provide context and orientation information.
13. Provide clear navigation mechanism.
14. Ensure that documents are clear and simple

For specific checkpoints about each guideline, check the Web Content Accessibility Guideline 1.0 document itself at http://www.w3c.org/TR/WCAG10

Accessible Design Benefits Everyone

The 3WC Web Content Accessibility Guidelines 1.0 address a variety of situations where users operate very differently from the norm, including but not limited to disabilities. Special contexts also include using a different operating system, a voice browser, or a small screen. Urging content developers to consider different situations during page design, the guidelines assert that while each design choice is made with a specific situation in mind, it "generally benefits several disability groups and the Web community as a whole. " For example, captioning of audio files not just makes audio files accessible

to the hearing impaired, but also supports better machine indexing of content and faster searching of content; redundant text/audio/video can support different learning styles, low literacy levels and second-language access.

For a company, accessible Web design means good business. It's a way to add huge pool of potential customers as well as their relatives, friends and employers.

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Legal Requirement

Designing accessible Web, in some cases, is not only out of a pragmatic concern for accessibility and usability, but also for complying with the law:

- The Americans with Disabilities Act

requires that all businesses with 15 or more employees make reasonable accommodation for employees or potential employees with disabilities. If the software they use is not accessible, the individuals are entitled to sue their employers or prospective employers. This act has been interpreted to also require commercial Websites to be accessible.

- Section 508 of the Rehabilitation Act

requires that Federal agencies' electronic and information technology is accessible to people with disabilities.

- Section 255 of the Telecommunications Act

requires that hardware and software products are made usable by individuals with disabilities, or compatible with existing accessibility aids. This may apply to any hardware or software that transfers information over the Internet, a network, or phone lines.

What should you do?

As Tim Berners Lee, inventor of the Web and Director W3C remarks, "the power of the Web is in its universality. Access by everyone, regardless of disability, is an essential aspect". Information designers have the responsibility of designing accessible Websites for all users. Designing accessibility should be an integral part of the design process, not something peripheral that can be dismissed or ignored out of time or resource contingency. Information designers can take actions to ensure that the Web is truly accessible to everyone:

- When designing a Website, keep a wide range of users in mind.
- Follow W3C Web Content Accessibility guidelines.
- Learn techniques and assistive technology that enhance Web accessibility.
- Test your site with disabled users.
- Test your site on different browsers.
- Be a Web accessibility advocate and help to foster accessibility awareness among your peers.

Resources and Links

Microsoft Accessible Design Guidelines. Includes tips, testing checklists, code examples
http://www.microsoft.com/enable/dev/web/default.htm

Trace Research and Development Center at University of Wisconsin-Madison. A Leading research center for the study and promotion of Web accessibility. Comprehensive resources about Web accessibility issues.
http://trace.wisc.edu/world/web/

University of Washington Accessible Web Page Design. List resources for creating accessible web pages.

http://www.washington.edu/doit/Resources/web-design.html

Web Content Accessibility Guidelines 1.0. Complete lists of guidelines, checkpoints, glossary
http://www.w3c.org/TR/WCAG10

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