The Center for Accessible Technology

Web Accessibility

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Accessibility is the degree to which people can access and use a website using any web browsing technology. A fully accessible site is designed to make use of the latest web technologies such as multimedia, while at the same time accommodating the needs of those who have difficulty with or are unable to use these technologies. Sites that are inaccessible block a significant number of users from the site. It is the electronic equivalent of building a set of stairs at the front of a building without also providing a way for wheelchair users to enter the building.

Accessibility ensures that the internet is a tool that enhances everyone’s ability to access information, rather than a means of exclusion.

**Audience**

According to the U. S. Census Bureau, about 50 million Americans have a disability and about 33 million of these individuals have a severe disability. This is a significant percentage of the population and it is difficult to make a case that these people should be excluded from using the internet - something that has become an everyday activity for most consumers. A significant number of people who do not consider themselves “disabled” are also affected by inaccessible website design. This group includes seniors who often experience reduced mobility and visual acuity, people with low literacy skills who have difficulty navigating sites with complex text and by people with learning disabilities who have difficulty reading or understanding text.

Below are some statistics showing numbers of people in the US with specific disabilities or impairments likely to have an impact on their use of the internet:

- 3.3 million Americans are blind or partially sighted
- 3.5 million people experience color blindness
- 28 million Americans have a hearing impairment
- 41 million adults have only basic literacy skills
- 29.5 million Americans are dyslexic
- 4.7 million people are affected by strokes
**Eyesight (Blindness, low vision, color blindness)**

This includes people with no vision, or some functional vision. This group also includes people with color blindness and those with eyesight problems related to ageing.

To access the Web, many individuals who are blind rely on screen readers - software that reads text on the screen monitor and outputs the test to a speech synthesizer or refreshable Braille display.

Examples of barriers that people with blindness may encounter on the Web can include:

- images that do not have a written description
- complex images (e.g., graphs or charts) that are not adequately described
- video that is not described in text or audio
- unusual document formats that may be difficult for their screen reader to interpret

There are many types of low vision, for instance poor acuity (vision that is not sharp), tunnel vision (seeing only the middle of the visual field), central field loss (seeing only the edges of the visual field), and clouded vision.

To use the Web, some people with low vision use extra-large monitors, and increase the size of system fonts and images. Others use screen magnifiers or screen enhancement software. Some individuals use specific combinations of text and background colors, such as a 24-point bright yellow font on a black background, or choose certain typefaces that are especially legible for their particular vision requirements.

- Web pages with font sizes that do not change (enlarge or reduce) easily
- Web pages that, because of inconsistent layout, are difficult to navigate when enlarged, due to loss of surrounding context
- Web pages, or images on Web pages, that have poor contrast, and whose contrast cannot be easily changed.
• text presented as images, which prevents wrapping to
  the next line when enlarged

• many of the barriers listed for blindness, above also
  apply to this group

Color blindness is a lack of sensitivity to certain colors. Common forms of color blindness include difficulty distinguishing between red and green, or between yellow and blue. Sometimes color blindness results in the inability to perceive any color.

To use the Web, some people with color blindness use their own style sheets to override the font and background color choices of the author.

Barriers that people with color blindness encounter on the Web include:

• color that is used as a unique marker to emphasize text
  on a Web site

• text that inadequately contrasts with background color or patterns

• browsers that do not support user override of authors’ style sheets

**Hearing**

Deafness involves a substantial uncorrectable impairment of hearing in both ears. Some deaf individuals' first language is a sign language, and they may or may not read a written language fluently, or speak clearly. A person with a mild to moderate hearing impairment may be considered hard of hearing.

To use the Web, many people who have hearing impairments rely on captions for audio content. They may need to turn on the captions on an audio file as they browse a page; concentrate harder to read what is on a page; or rely on supplemental images to highlight context.
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Barriers that people who are deaf or hard of hearing encounter on the Web include:

- lack of captions or transcripts of audio on the Web, including webcasts
- 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
- lack of clear and simple language
- requirements for voice input on Web sites

Mobility and Motor disabilities

This covers a wide range of people with varying types of physical disabilities. With regards to the web accessibility, this refers largely to people with upper limb mobility, manual dexterity and co-ordination problems. This can be caused though a disability that an individual is born with or one that develops due to illness such as Multiple Sclerosis (MS), Parkinson’s or a stroke. People with a broken bone would also temporarily fall into the category.

Motor disabilities can include weakness, limitations of muscular control (such as involuntary movements, lack of coordination, or paralysis), limitations of sensation, joint problems, or missing limbs. Some physical disabilities can include pain that impedes movement. These conditions can affect the hands and arms as well as other parts of the body.

To use the Web, people with mobility or motor disabilities may use a specialized mouse; a keyboard with a layout of keys that matches their range of hand motion; a pointing device such as a head-mouse, head-pointer or mouth-stick; voice-recognition software; an eye-gaze system; or other assistive technologies to access and interact with the information on Web sites. They may activate commands by typing single keystrokes in sequence with a head pointer rather than typing simultaneous keystrokes. They may need more time when filling out interactive forms on Web sites if
they have to concentrate or maneuver carefully to select each keystroke.

Barriers that people with motor disabilities encounter on the Web include:

- poorly designed sites that require too many “mouse clicks” to access information
- time-limited response options on Web pages
- browsers and authoring tools that do not support keyboard alternatives for mouse commands
- forms that cannot be tabbed through in a logical order

**Cognitive impairments, learning disabilities, seizure disorders**

Cognitive impairment refers to people with dyslexia and learning difficulties. Learning problems can range from someone who has a serious mental impairment, or may be due to more common factors as poor literacy, a low level of skill using a computer, having to use the web in a second language, or problems understanding information.

Individuals may have difficulty processing written language, images speech or numbers.

To use the Web, people with learning disabilities may rely on getting information through several technologies at the same time. For instance, someone who has difficulty reading may use a screen reader plus synthesized speech to facilitate comprehension, while someone with an auditory processing disability may use captions to help understand an audio track. Some individuals with seizure disorders, including people with some types of epilepsy, are triggered by visual flickering or audio signals at a certain frequency.

Barriers that people in this group encounter on the Web include:

- use of unnecessarily complex language on Web sites
- lack of graphics on Web sites
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- lack of clear or consistent organization of Web sites
- lack of alternative information sources on Web sites, for instance lack of alternative text that can be converted to audio to supplement visuals, or the lack of captions for audio
- distracting visual or audio elements that cannot easily be turned off
- use of visual or audio frequencies that can trigger seizures

Age related disabilities
Changes in people's functional ability due to aging can include subtle and/or gradual changes in abilities or a combination of abilities including vision, hearing, dexterity and memory. Barriers can include any of the issues already mentioned above. Any one of these limitations can affect an individual's ability to access Web content. Together, these changes can become more complex to accommodate.

For example, someone with low vision may need screen magnification, however when using screen magnification the user loses surrounding contextual information, which adds to the difficulty which a user with short-term memory loss might experience on a Web site.

- lack of clear or consistent organization of Web sites

Summary
The Web is an increasingly important resource in many aspects of life: education, employment, government, commerce, health care, recreation, and more. The Web is used for receiving information as well as providing information and interacting with society. It is essential that the Web be accessible in order to provide equal access and equal opportunity to people with disabilities.