VOLOPER Creations Inc.

WHITEPAPER

Understanding Web Accessibility

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3100 steeles avenue west, suite 400, vaughan, ontario L4K 3R1, canada | tel: 905.660.1481 | fax: 905.660.6053 | toll free: 1.800.252.4519 | www.voloper.com

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SECTION 1: UNDERSTANDING WEB ACCESSIBILITY

10 Myths of Web Accessibility

1. **A website is accessible to anybody who wants to see it. After all it's on the Web.**

   FALSE: A website is required to meet specific criteria set by the World Accessibility Initiative (WAI), which is described in section 5, before it can be classified as accessible. It's a common misconception that because a website is available publicly that it is also accessible.

2. **Accessible pages must be text only and dull.**

   FALSE: Colors, fonts, margins and other layout elements can be easily specified for a webpage using style sheets-. This means that site visitors can use their own preferences and still access the content of the site. This also applies to the use of multi-media elements such as video and sound, where alternative content can be provided to those unable or who do not want to experience such features.

3. **Accessibility is only for blind people.**

   FALSE: Web accessibility can be of use to a large number of people, not just visually impaired Web users. Some Web users for reasons of speed or ease prefer to have graphics or JavaScript turned off, a site relying on either or both will be inaccessible to such a user.

4. **The Web is a graphical medium**.

   FALSE: The Web uses text, sound, video and still images. While it does rely heavily on graphics, this should not be the sole medium used. Designing a site purely with graphics without considering alternative access for text only or visually impaired user is bad practice. Something to consider in light of more recent events is that you could incur legal charges as well as alienating thousands of potential visitors.

   It is also important to remember that machine based devices such as search engines rely solely on plain text within your page to list your site within their searches. If you do not provide, for example alternative text for a heavily graphical site, you may find your site lower in the search engine ranks than you would if there were a more text base approach.

5. **Frames are strictly not allowed in an accessible website.**

   FALSE: Frames are more of an irritation than anything else. A website using frames can be accessible using the correct markup. As long as each frame has a name and a purpose, there is no reason why they cannot be used. They do however present problems with some screen readers and visitors may have difficulty knowing what has changed within the window. You also have to consider Search Engines that cannot read Web page content hidden inside a frame.

6. **I don't need to develop for Web browsers other than Internet Explorer as not enough people use the alternatives.**

   FALSE: While Internet Explorer is the most popular browser on the Web, there are still significant numbers of non Internet Explorer users. Accessibility covers all Web users regardless of browser type and version, ensuring the content is presented in a universal manner.

7. **I know the target audience will use a certain browser with a certain configuration so I only need design for that.**

   FALSE: You can never be 100% sure of who is visiting your site and how they are viewing it. This is especially important considering new trends in mobile internet devises such as WAP phones or handheld PC's. Even if you can be sure of your visitors' current preferences, you cannot guarantee that this will not change in the future. It's far better to play it safe from the start of development rather than have to 'fix' things later on.

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8. **It takes too much time, effort and money to make accessible pages.**

   FALSE: Careful planning from an early stage, knowledge of Web accessibility issues and use of appropriate and already accessible elements for the website should greatly reduce costs for authoring an accessible website from scratch. Costs are usually incurred when accessibility has not been considered from the outset and additional markup is required at a later date to meet necessary requirements, or the site is so complex that in order to make it accessible a great skill and effort is required from a Web Developer.

9. **I have no disabled people coming to my site, so I don't need to consider accessibility.**

   FALSE: You cannot be sure who is visiting your site and whether or not they have a disability. It is far easier to make your site available and accessible to anyone than to make assumptions about your site visitors.

10. **The Internet is not covered by the Disability Discrimination Act so I don't need to bother about making my website accessible.**

    FALSE: While this is a contentious issue, there are cases and studies at the minute which suggest that your web-site is taken into account with the DDA. This is especially relevant if you offer your services online or part of the work undertaken by staff is related to your website.

So, what is Web Accessibility?

Web accessibility means that people with disabilities can use the Web. More specifically, Web accessibility means that people with disabilities can perceive, understand, navigate, and interact with the Web, and that they can contribute to the Web. Web accessibility also benefits others, including older people with changing abilities due to aging.

Web accessibility encompasses all disabilities that affect access to the Web, including visual, auditory, physical, speech, cognitive, and neurological disabilities.

Millions of people have disabilities that affect their use of the Web. Currently most Web sites and ***Web software*** have **accessibility barriers** that make it difficult or impossible for many people with disabilities to use the Web. As more accessible websites and software become available, people with disabilities are able to use and contribute to the Web more effectively.

ACCESSIBLE WEBSITES USUALLY SEE A LARGE INCREASE IN TRAFFIC AS THEY BECOME AVAILABLE TO ALL INTERNET USERS

Web accessibility also **benefits** people *without* disabilities. For example, a key principle of Web accessibility is designing Web sites and software that are flexible to meet different user needs, preferences, and situations. This **flexibility** also benefits people *without* disabilities in certain situations, such as people using a slow Internet connection, people with "temporary disabilities" such as a broken arm, and people with changing abilities due to aging.

Accessible websites usually see a large increase in traffic as they become available to all Internet users. Web accessibility is extremely important as a **website that's optimized in web accessibility** has numerous benefits:

- They fulfill legal obligations, such as the Code of Practice of Disability Discrimination Act in the UK
- Access to these websites is maximized as they support text only Browsers, WebTV, Screen Readers or handheld devices
- They are generally less time-consuming to manage as accessible websites separate the content (the words and images that we see on the screen) and presentation (the way that these words and images are laid out) of each page by implementing Style Sheets. This simplifies the Web page layout process and saves considerable time
- They always have a much higher Search Engine ranking. Search Engines usually do not understand images, JavaScript, Flash, audio and video content. Search Engines will be able to understand the purpose of the website more easily if alternative content to each of these is available. The more confident a Search Engine is of what the website is about, all other things being equal, the higher in the search rankings it will place that website
- Because there is a certain amount of overlap between Web accessibility and Web usability is has been shown that a usability redesign increases the sales/conversion rate of a website by 100%

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Why Web Accessibility is Important

The Web is an increasingly important resource for education, recreation, health care, employment and others. It is essential that websites are constructed with accessibility in mind, in order to provide equal access and equal opportunity to those with disabilities. Creating websites which follow accessibility guidelines can help those with disabilities participate more actively in society.

The Internet offers endless possibilities of access to information and interaction for many people with and without disabilities. With that in mind, barriers to audio, print and visual media are gradually dissipating through the use of progressive Web technologies.

As the popularity of the Internet grows and with that becoming a more acceptable medium, Web accessibility in some cases is required by law as to avoid discrimination.

The WAI Web Accessibility Policy Resources (http://www.w3.org/WAI/policy-res.html) provides resources for organizations wishing to address legal and policy factors as well as a list of relevant laws and policies around the globe.

Different Disabilities that Can Affect Web Accessibility

This section of our White Paper will describe, in general, the types of disabilities that affect access to the Web. As of yet, there are no categorically accepted 'types' of disabilities around the globe, although there are continuous efforts to coordinate this. There is no commonly set terminology when describing disabilities, so you will find variations from country to country and among various disability communities. The majority of terminologies used among communities will refer to functional disabilities rather than medical disabilities.

Abilities can vary from person to person, and over time, for different people with the same type of disability. People can have combinations of different disabilities and combinations of varying levels of severity.

The term "disability" is used very generally throughout this White Paper. Some people with conditions described below would not consider themselves to have disabilities. They may, however, have limitations of sensory, physical or cognitive functioning which can affect access to the Web. These may include injury-related and aging-related conditions and can be temporary or chronic.

The number and severity of limitations tend to increase as people age and may include changes in vision, hearing, memory, or motor function. Aging-related conditions can be accommodated on the Web by the same accessibility solutions used to accommodate people with disabilities.

AS THE POPULARITY OF THE INTERNET GROWS AND WITH THAT BECOMING A MORE ACCEPTABLE MEDIUM, WEB ACCESSIBILITY IN SOME CASES IS REQUIRED BY LAW AS TO AVOID DISCRIMINATION.

Sometimes different disabilities require similar accommodations. For instance, someone who is blind and someone who cannot use his or her hands both require full keyboard equivalents for mouse commands in browsers and authoring tools, since they both have difficulty using a mouse but can use assistive technologies to activate commands supported by a standard keyboard interface.

Many accessibility solutions described in this White Paper contribute to "universal design" (also called "design for all") by benefiting non-disabled users as well as people with disabilities. For example, support for speech output not only benefits blind users, but also Web users whose eyes are busy with other tasks; while captions for audio not only benefit deaf users, but also increase the efficiency of indexing and searching for audio content on Web sites.

Each description of a general type of disability includes several brief examples of the kinds of barriers someone with that disability may experience on the Web. These lists of barriers are illustrative and not intended to be comprehensive. Barrier examples listed here are representative of accessibility issues that are relatively easy to address with existing accessibility solutions, except where otherwise noted.

Visual disabilities

Blindness

Blindness involves a substantial, uncorrectable loss of vision in both eyes.

To access the Web, many individuals who are blind rely on screen readers -- software that reads text on the screen (monitor) and outputs this information to a speech synthesizer and/or refreshable Braille display. Some people who are

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blind use text-based browsers such as Lynx, or voice browsers, instead of a graphical user interface (GUI) browser plus screen reader. They may use rapid navigation strategies such as tabbing through the headings or links on Web pages rather than reading every word on the page in sequence.

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

- images that do not have alternative text
- complex images (e.g., graphs or charts) that are not adequately described
- video that is not described in text or audio
- tables that do not make sense when read serially (in a cell-by-cell or "linearized" mode)
- frames that do not have "NOFRAME" alternatives, or that do not have meaningful names
- forms that cannot be tabbed through in a logical sequence or that are poorly labeled
- browsers and authoring tools that lack keyboard support for all commands
- browsers and authoring tools that do not use standard applications programmer interfaces for the operating system they are based in
- non-standard document formats that may be difficult for their screen reader to interpret

Low vision

There are many types of low vision (also known as "partially sighted" in parts of Europe), such as 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.

Barriers that people with low vision may encounter on the Web can include:

- Web pages with absolute 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 through user override of author style sheets
- text presented as images, which prevents wrapping to the next line when enlarged
- also many of the barriers listed for blindness, above, depending on the type and extent of visual limitation

Color blindness

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 may encounter on the Web can include:

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- 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 Impairments

Deafness

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

To use the Web, many people who are deaf 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. Barriers that people who are deaf may encounter on the Web can 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

Hard of hearing

A person with a mild to moderate hearing impairment may be considered hard of hearing

To use the Web, people who are hard of hearing may rely on captions for audio content and/or amplification of audio. They may need to toggle the captions on an audio file on or off, or adjust the volume of an audio file.

Barriers encountered on the Web can include:

- lack of captions or transcripts for audio on the Web, including webcasts

Physical disabilities

Motor disabilities

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 motor disabilities affecting the hands or arms 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 ("chording") to activate commands. 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 affecting the hands or arms may encounter include:

- time-limited response options on Web pages

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- browsers and authoring tools that do not support keyboard alternatives for mouse commands
- forms that cannot be tabbed through in a logical order

Speech disabilities

Speech disabilities

Speech disabilities can include difficulty producing speech that is recognizable by some voice recognition software, either in terms of loudness or clarity.

To use parts of the Web that rely on voice recognition, someone with a speech disability needs to be able to use an alternate input mode such as text entered via a keyboard.

Barriers that people with speech disabilities encounter on the Web can include:

- Web sites that require voice-based interaction and have no alternative input mode

Cognitive and neurological disabilities

Dyslexia, dyscalculia

Individuals with dyslexia or dyscalculia (sometimes called "learning disabilities" in the U.S.) may have difficulty processing written language or images when read visually, or spoken language when heard, or numbers when read visually or heard.

To use the Web, people with learning disabilities may rely on getting information through several modalities 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.

Barriers that people with learning disabilities may encounter on the Web can include:

- lack of alternative modalities for information 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

Attention deficit disorder

Individuals with attention deficit disorder may have difficulty focusing on information.

To use the Web, an individual with an attention deficit disorder may need to turn off animations on a site in order to be able to focus on the site's content.

Barriers that people with attention deficit disorder may encounter on the Web can include:

- distracting visual or audio elements that cannot easily be turned off
- lack of clear and consistent organization of Web sites

Intellectual impairments

Individuals with impairments of intelligence (sometimes called "learning disabilities" in Europe; or "developmental disabilities" or "mental retardation" in the United States) may learn more slowly, or have difficulty understanding complex concepts. Down syndrome is one among many different causes of intellectual impairments.

To use the Web, people with intellectual impairments may take more time on a Web site, may rely more on graphics to enhance understanding of a site, and may benefit from the level of language on a site not being unnecessarily complex for the site's intended purpose.

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Barriers can include:

- use of unnecessarily complex language on Web sites
- lack of graphics on Web sites
- lack of clear or consistent organization of Web sites

Memory impairments

Individuals with memory impairments may have problems with short-term memory, missing long-term memory, or some loss of language.

To use the Web, people with memory impairments may rely on a consistent navigational structure throughout the site.

Barriers can include:

- lack of clear or consistent organization of Web sites

Mental health disabilities

Individuals with mental or emotional disabilities may have difficulty focusing on information on a Web site, or difficulty with blurred vision or hand tremors due to side effects from medications.

To use the Web, people with psychiatric disabilities may need to turn off distracting visual or audio elements, or to use screen magnifiers.

Barriers can include:

- distracting visual or audio elements that cannot easily be turned off
- Web pages with absolute font sizes that do not enlarge easily

Seizure disorders

Some individuals with seizure disorders, including people with some types of epilepsy, are triggered by visual flickering or audio signals at a certain frequency.

To use the Web, people with seizure disorders may need to turn off animations, blinking text, or certain frequencies of audio. Avoidance of these visual or audio frequencies in Web sites prevents inadvertent triggering of seizures.

Barriers can include:

- use of visual or audio frequencies that can trigger seizures

Multiple Disabilities

Combinations of disabilities may reduce a user's flexibility in using accessibility information.

For instance, while someone who is blind can benefit from hearing an audio description of a Web-based video, and someone who is deaf can benefit from seeing the captions accompanying audio, someone who is both deaf and blind needs access to a text transcript of the description of the audio and video, which they could access on a refreshable Braille display.

Similarly, someone who is deaf and has low vision might benefit from the captions on audio files, but only if the captions could be enlarged and the color contrast adjusted.

Someone who cannot move his or her hands, and also cannot see the screen well, might use a combination of speech input and speech output, and might therefore need to rely on precise indicators of location and navigation options in a document.

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Aging-Related Conditions

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.

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SECTION 2: HOW TECHNOLOGY ASSISTS WITH WEB ACCESSIBILITY

Assistive technologies are products used by people with disabilities to help accomplish tasks that they cannot accomplish otherwise or could not do easily otherwise. When used with computers, assistive technologies are sometimes referred to as adaptive software or hardware.

Some assistive technologies are used together with graphical desktop browsers, text browsers, voice browsers, multimedia players, or plug-ins. Some accessibility solutions are built into the operating system, for instance the ability to change the system font size, or configure the operating system so that multiple-keystroke commands can be entered with a sequence of single keystrokes.

Adaptive strategies are techniques that people with disabilities use to assist in using computers or other devices. For example someone who cannot see a Web page may tab through the links on a page as one strategy for helping skim the content. Following is a list of the assistive technologies and adaptive strategies which are described below. This is by no means a comprehensive list of all such technologies or strategies, but rather explanations of examples highlighted in the scenarios above.

- alternative keyboards or switches
- Braille and refreshable Braille
- scanning software
- screen magnifiers
- screen readers
- speech recognition
- speech synthesis
- tabbing through structural elements
- text browsers
- visual notification
- voice browsers

ADAPTIVE STRATEGIES ARE TECHNIQUES THAT PEOPLE WITH DISABILITIES USE TO ASSIST IN USING COMPUTERS OR OTHER DEVICES.

Alternative keyboards or switches

Alternate keyboards or switches are hardware or software devices used by people with physical disabilities, which provide an alternate way of creating keystrokes that appear to come from the standard keyboard. Examples include keyboard with extra-small or extra-large key spacing, key guards that only allow pressing one key at a time, on-screen keyboards, eyegaze keyboards, and sip-and-puff switches. Web-based applications that can be operated entirely from the keyboard, with no mouse required, support a wide range of alternative modes of input.

Braille and refreshable Braille

Braille is a system which uses six to eight raised dots in various patterns to represent letters and numbers that can be read by the fingertips. Braille systems vary greatly around the world. Some "grades" of Braille include additional codes beyond standard alpha-numeric characters to represent common letter groupings (e.g., "th," "ble" in Grade II American English Braille). In order to make Braille more compact; an 8-dot version of Braille has been developed to allow all ASCII characters to be represented. Refreshable or dynamic Braille involves the use of a mechanical display where dots (pins) can be raised and lowered dynamically to allow any Braille characters to be displayed. Refreshable Braille displays can be incorporated into portable Braille devices with the capabilities of small computers, which can also be used as interfaces to devices such as information kiosks.

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Scanning software

Scanning software is an adaptive software used by individuals with some physical or cognitive disabilities that highlights or announces selection choices (e.g., menu items, links, phrases) one at a time. A user selects a desired item by hitting a switch when the desired item is highlighted or announced.

Screen magnifiers

Screen magnification is software used primarily by individuals with low vision that magnifies a portion of the screen for easier viewing. At the same time screen magnifiers make presentations larger, they also reduce the area of the document that may be viewed, removing surrounding context. Some screen magnifiers offer two views of the screen: one magnified and one default size for navigation.

Screen readers

Software used by individuals who are blind or who have dyslexia that interprets what is displayed on a screen and directs it either to speech synthesis for audio output, or to refreshable Braille for tactile output. Some screen readers use the document tree (i.e., the parsed document code) as their input. Older screen readers make use of the rendered version of a document, so that document order or structure may be lost (e.g., when tables are used for layout) and their output may be confusing.

Speech recognition

Speech (or voice) recognition is used by people with some physical disabilities or temporary injuries to hands and forearms as an input method in some voice browsers. Applications that have full keyboard support can be used with speech recognition.

Speech synthesis (speech output)

Speech synthesis or speech output can be generated by screen readers or voice browsers, and involves production of digitized speech from text. People who are used to using speech output sometimes listen to it at very rapid speeds.

Tabbing through structural elements

Some accessibility solutions are adaptive strategies rather than specific assistive technologies such as software or hardware. For instance, for people who cannot use a mouse, one strategy for rapidly scanning through links, headers, list items, or other structural items on a Web page is to use the tab key to go through the items in sequence. People who are using screen readers -- whether because they are blind or dyslexic -- may tab through items on a page, as well as people using voice recognition.

Text browsers

Text browsers such as Lynx are an alternative to graphical user interface browsers. They can be used with screen readers for people who are blind. They are also used by many people who have low bandwidth connections and do not want to wait for images to download.

Visual notification

Visual notification is an alternative feature of some operating systems that allows deaf or hard of hearing users to receive a visual alert of a warning or error message that might otherwise be issued by sound.

Voice browsers

Voice browsers are systems which allow voice-driven navigation, some with both voice-input and voice-output, and some allowing telephone-based Web access.

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SECTION 3: THE PRESENTATION LAYER

Making the Web Accessible

Much of the focus on Web accessibility has been on the responsibilities of Web developers. However, Web software also has a vital role in Web accessibility. Software needs to help developers produce and evaluate accessible Web sites, and be usable by people with disabilities.

One of the roles of the Web Accessibility Initiative (WAI) is to develop guidelines and techniques that describe accessibility solutions for Web software and Web developers. These WAI guidelines are considered the international standard for Web accessibility.

Making Your Web Site Accessible

Making a Web site accessible can be simple or complex, depending on many factors such as the type of content, the size and complexity of the site, and the development tools and environment.

Many accessibility features are easily implemented if they are planned from the beginning of Web site development or redesign. Fixing inaccessible Web sites can require significant effort, especially sites that were not originally "coded" properly with standard XHTML markup, and sites with certain types of content such as multimedia.

The document "Implementation Plan for Web Accessibility" (http://www.w3.org/WAI/impl/) lists basic steps for addressing accessibility in Web projects. The Web Content Accessibility Guidelines and techniques (http://www.w3.org/WAI/intro/wcag.php) documents provide detailed information for developers.

Evaluating the Accessibility of a Web Site

When developing or redesigning a site, evaluating accessibility early and throughout the development process can identify accessibility problems early when it is easier to address them.

Simple techniques such as changing settings in a browser can determine if a Web page meets some accessibility guidelines. A comprehensive evaluation to determine if a site meets all accessibility guidelines is much more complex.

MUCH OF THE FOCUS ON WEB ACCESSIBILITY HAS BEEN ON THE RESPONSIBILITIES OF WEB DEVELOPERS.

There are evaluation tools that help with evaluation. However, no tool alone can determine if a site meets accessibility guidelines. Knowledgeable human evaluation is required to determine if a site is accessible.

The document "Evaluating Web Sites for Accessibility" (http://www.w3.org/WAI/eval/Overview.html) provides guidance on preliminary reviews using techniques to quickly assess some of the accessibility problems on a site. It also provides general procedures and tips for evaluating conformance to accessibility guidelines.

Issues Surrounding Navigation

Consider the TAB order of the various links and form elements on the page. The default is the order in which these elements appear in the HTML code. However this may not be the most logical or predictable root. If the order of links is not intuitive then you should use the TABINDEX attribute to reorder the links.

<A href="http://www.mywebsite.com/site_map.aspx" tabindex="4">WAI Site Map</A>

The easiest way to see the order is to use your keyboard and start at the Address bar then using the 'Tab key' to move from one hyperlink to another.

Don't require users to be able to click on a small link or moving target in order to proceed to another page, because people with mobility difficulties may not be able to move the mouse with precision.

Try to avoid using pop-up windows and avoid opening new browser windows (or warn the user beforehand). When using a new browser window inform the user of their 'location' and how to get back to the original page.

If you do use DHTML, disjointed rollovers or cascading menus ensure that another clear navigation method is provided.

Your site needs to incorporate a **clear navigation structure**.

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There are many methods for implementing this issue, each of which has their own accessibility problems. One rule of thumb is that by whatever route used(usually site map) **any page must not be more than three links away**.

Always provide a skip navigation link for users to jump over the navigation or repetitive content of a site. Otherwise screen readers will have to listen to all the recurring content on each page throughout the site.

Avoid the use of many redundant links such as placing contact details on every page; a link from the homepage would be sufficient.

WAVE is a very useful tool to view your page with the image ALT tag's highlighted and the code reading order shown. (http://www.temple.edu/inst_disabilities/piat/wave/).

Types of Navigation

1. Graphical Navigation Elements

Navigational graphics or images are usually placed down the side or across the top of a page often forming navigational bars. These images are sometimes graphical representations of text or icons to represent areas of the site. The problem with using an icon graphic is if an abstract instead of a concrete image is used, it will not be intuitive.

2. Text Navigation Elements

Text is sometimes used in a navigation bar in place of, or with graphical navigation elements. The text can be located just below the navigation graphic or as an alternative navigation method at the bottom of a page. If both text and graphics are used together by enclosing both elements within one hyperlink tag and using an empty ALT attribute a repetition of the alternative graphic description can be avoided while maintaining the image as a hyperlink. Include non-link, printable characters (surrounded by spaces) between adjacent links.

3. Breadcrumb Navigation

These navigation links identify one's depth into the hierarchical structure of a site. They are usually located across the top of a page listing sections and subsections in a string of links. Each link in the breadcrumb navigation returns the user to the uppermost page in any given section of the site. A variety of link separators can be used but often the greater than symbol (> or graphic representation of) is typical.

ALWAYS PROVIDE A SKIP NAVIGATION LINK FOR USERS TO JUMP OVER THE NAVIGATION OR REPETITIVE CONTENT OF A SITE.

4. Contextual navigation links

These are links that are generally found within the text of a page, and lead to related information, definitions, references, etc. found on the same page or on other pages of the site. The links need to be understandable when taken out of context, so links like "click here" would be inaccessible to a user depending on screen reading, which supports navigation by a list of hyperlinks.

5. Sequential navigation

This type of navigation follows a particular order or sequence, with the common links "back", "forward", "home". These links can be used to force the user to follow a particular navigation path. Provide information about document collections such as how many "pages" or screen have been passed in the collection and how many are to go. E.g. 1, 2, 3 > Page 4 > 5, 6, 7, 8.

6. Global Navigation Site Maps

A site-map is essentially a list of all the major pages in a site, and allows the user to see the relationships between various sections of a site. It also allows the user to link to any page of the site from a single location. A site map is essentially the table of contents or index of the pages contained within a website. These can sometimes be shown graphically but a text alternative should be provided.

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Page Design

Good page design involves focusing on three fundamentals of communication design: consistency, clarity and common sense providing clear directions and choices for visitors, building consistent layouts, and adopting a visitor's point of view." (Conference paper: "A Common Sense Approach to Web Accessibility", Tom McCain)

Pages should be set out clearly, simply and have recognizable patterns of structural design elements (e.g. headers). Try to start the page with the conclusion as well as a short summary of the remaining contents ("inverted pyramid" style).

If text is set in columns make sure the space between columns is generous. If space is limited, use a vertical rule. Use unjustified, ragged right, text setting with even word spacing. Do not justify text because this creates uneven word spaces and makes the text harder to read.

It is therefore recommended that the text within websites be very succinct, with only one key idea per paragraph, as well as use highlighted keyword or phrases and bulleted lists (Morkes & Nielsen, 1997).

Use real text in preference to an image of text and use structural mark-up wisely.

Avoid, if possible, the use of graphics in place of actual text. Text size and color can be changed by the user's browser settings, but a graphic is fixed, and can't be changed in this way. Use heading mark-up (e.g. <H1>) appropriately. Don't use headings simply to increase text size, and try not to use bold or a larger font size to simulate headings. Some browsers can present the user with an overview of a web page based on the headings and sub-headings - this doesn't work if headings have been used inappropriately, or not used when required. Page size issues ensure that the web page background does not contain any vital information, as some users may not be able to see this. Remember that most web designers and graphic designers work on larger screens than many ordinary Internet users. If you decide to fix the width of your pages, try to avoid making it more than 800 pixels wide. Anything larger than this will mean many web users have to scroll from left to right and back again as they read down the page.

You should always try to give generous margins for pages of text. This helps reading and doesn't lead the eye off the page. This will also encourage you to restrict the sentence and paragraph width to less than 70 characters.

Printing

It is worth considering whether people visiting your site are likely to print pages. If there is a page particularly likely to be printed, try to fix the width of the page so that it can be printed on A4 paper without losing part of the page. The alternative is to provide a printer friendly version.

GOOD PAGE DESIGN INVOLVES FOCUSING ON THREE FUNDAMENTALS OF COMMUNICATION DESIGN

Presentation and Customization

Description
Design, color and presentation issues including the requirements for user control.

How to gain full marks for the precept.
An accessible or usable web page does not have to be dull! Well designed web pages are clear and intuitive and the user feels comfortable. Consider the use of minimalist design and the issues of color / contrast. Make sure that pages can be reformatted or represented with equivalent content for users with differing needs.

This section will cover the following topics for discussion:

- **Visual designs / presentations issues** - The appropriate implementation of CSS and html mark-up to provide undeniable simplicity, clarity. Information density should be reduced to less than 50 percent of the screen area. Use style sheets to separate content and its presentation.

- **Visual presentation of text** - The appropriate use of text fonts, typefaces, weights and styles to ensure visual readability. Do not use flickering, blink or moving text.

- **Color and contrast issues** - Choose contrasting colors for backgrounds and text. Don't use color as the only means to convey information. Consider the way a color blind person would view the design. Choose a background that is a single, solid color. If possible, avoid loud textures, patterns or images.

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- **User control over presentation and use of user style sheets** - The user should be able to reformat the page within the browser settings and user style sheets. Ensure that the content is understandable without any presentation mark-up.

Web design has been through many changes, the way in which we use mark-up as a presentation tool is dramatically changing. Most people who start to code Web pages use the Presentation mark-up tags or attributes such as <B> Bold</B>, <FONT color="blue" face="Verdana" size="2">.

These are now slowly being replaced by Cascading Style Sheets. For an example please see "SECTION 4: Preparing Accessible Content" for a cascading style sheet.

You can see that they specify how elements are presented: e.g. h1 {font-family:Verdana, Arial, Helvetica, sans-serif} The 'H1' is then used as a structural mark-up whose presentation is given by the style sheet.

It is advised that for any given web page, it should contain 50% white space.
It is common for web pages to contain multiple information sources that are densely displayed (for example displaying: menu, adverts, news section, external links, log-in forms etc). When creating these types of pages, designers should take into consideration the cognitive and motor limitations of users. Layouts should be designed to reduce the cognitive burden associated with spatial visualization and visual-motor coordination i.e. avoid cramming content all over a page. Designs should appropriately group information by function (Dodson & Shields, 1978) and reduce overall information density to less than 50 percent of the screen area.
Cascading style sheets can also be used to produce real text, which looks like an image or button.

Minimalist Design
Consider the use of minimalist design in which pages are presented simply, with clarity and use of enough white space. Your page should not be crowded with text or links, be too long or appear simply as excessively large blocks. A page with 70 links is neither attractive nor easy to use.

Presentation of Text

Text can be presented using may different fonts, typefaces, weights and styles. The chosen layout of text can have a dramatic affect on the visual readability.

THE USE OF SMALL TEXT CAN BE AS DETRIMENTAL, SO ALWAYS ENSURE THAT TITLES AND CATEGORY HEADINGS ARE NOT TOO SMALL.

Capital texts
Text in all-capitals is much harder to read than normal-case continuous text. One or two words set in capitals do not create reading problems. Because they are bigger, capital letters are easier to see than lower-case letters, so may be suitable for labels. Do not capitalize whole sentence, as this can be visually distracting and annoying to the reader and appears as if you are SHOUTING!

Blinking text
Ensure your site does not use blinking text tags or marquee (scrolling) text as this is very hard to read and can distract the user from the important content.

Italics
Do not use large blocks of italics; if used for academic reasons keep its use to a minimum. It is accepted that italics can be used to differentiate words from a sentence, but it tends to reduce the sentences? overall readability.

Font Size
Do not use a large font size on your page, though you may have assumed that this will help a poor reader. In fact large font sizes can be harder to read as larger letters reduce 'scan-ability' when seen in large blocks of text. Standard (medium 12-14 pixels) size text is preferable. Users can adjust the text size to suit their needs by altering their browser settings. However, ensure that you use relative font sizes (size = 1, 2 etc) in your code, not absolute font sizes (size = 10 points). Some browsers can't over-ride absolute font sizes. The use of small text can be as detrimental, so always ensure that titles and category headings are not too small. Do not use small text for the main body of your site. However, smaller font sizes can be used for less important information such as the publication date at the bottom of a page.

Underlining
Don't underline large blocks of text as it makes reading harder. Underlining usually indicates hyperlinked text; it can be confusing for users if it is used where no link exists.

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Typeface
The choice of typeface is less important than contrast, type size, weight and the spacing of characters. Unusual, handwriting style script and titling faces are inappropriate for legible continuous text.

It is common to use a sans serif typeface (such as Arial or Helvetica) font in preference to a serif one (such as Times or Century) on the screen. Nevertheless Serif typefaces tend to be more 'readable' in continuous printed text for regular reading. Choose a medium weight typeface.

Numbers
If using many numbers it is important to choose a typeface with distinguishable number characters. This is particularly vital for statistic or experimental data. Some typefaces have figures that are easily misread: 3, 5 and 8, as well as 0 and 6 can be easily confused. Also the figure one '1' can be confused with 'I', 'l' and even '!'. A 'hooked' number one is much more distinctive than a straight vertical stroke '1'.

Color and Contrast

The choice of color for your images, text and background is very important to provide sufficient contrast between the elements of the page. Do not use color as the only means of distinguishing pages from one another. However, color can be very effective when used in combination with clear labeling to distinguish pages, sections and categories.

The most important contrast is that between the background and text. A simple way to check this is to take a screen shot of your proposed page and use a graphic editor to convert this into a grey scale image - by removing color from the image you will be better able to judge if the level of contrast between background and foreground colors is sufficient. Check your image files at different resolutions and color-depths.

Choose a background that is a single, solid color. If possible, avoid loud textures, patterns or images. However, do not rely on the background as the sole means of contrast as some users' browsers may not display them.

Color is very much an individual choice, what works for one person may not work for another. Try to ask colleagues for advice and go for the color scheme that is generally most readable and appealing.
There are a variety of color checkers and color palette tools that can be used to help.
Visibone Color Palette (http://vischeck.com/vischeckURL.php3) provides an online tool to view a single page in the same way as someone with Deuteranope (a form of red/green color deficit) would see your page.

…COLOR CAN BE VERY EFFECTIVE WHEN USED IN COMBINATION WITH CLEAR LABELING TO DISTINGUISH PAGES, SECTIONS, AND CATEGORIES.

Color Vision Simulator (http://newmanservices.com/colorblind/default.asp) is an online tool used to view your page (not pictures) as would be seen by people with various color deficiencies.
Color Lab, (http://www.visibone.com/colorlab/index.html) is a tool which allows you to select colors for your site from the web safe palette.

BT's Safe Web colors for Color Deficient Vision (http://www.labs.bt.com/people/rigdence/colours/) is a useful site where you can learn more about color blindness and download safe palettes for your authoring tools.

User control over presentation and use of user style sheets

Page code and design should be sufficiently flexible for users to be able to change the presentational elements to suit their needs (e.g. color).
The first thing to check is whether your browser is capable of resizing the text. In Internet Explorer and Netscape go to "View Menu" then to "Text Size". Ideally view your page in both browsers as the increase or decrease of font size can have a different effect within each one. Your text should increase in size and not overlap (a common problem with poorly written Cascading Style Sheets) to produce a readable and usable page.

If your page uses CSS then disable the style sheets in Netscape and/or remove the style sheet code from your page in Internet Explorer. Your page should still be having a consistent order, readable and usable.

To experiment with Internet Explorer try applying a user style sheet as follows:

- Download the bigger_style.css file.
- Go to the "Tools Menu" then to "Internet Options", and then on the "General Tab" select the "Accessibility . . ." button.

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- Check the "Ignore font styles specified on Web pages" and "Ignore font sizes specified on Web pages".
- Check the "Format documents using my style sheet" and enter the location of the bigger_style.css file in the Style Sheet edit box.
- Check Ok then return to the web page and hit Refresh if necessary.

Your page should, if successful, be dramatically bigger and yet remain readable and usable. You will however notice that any images of text have not been changed and it is important to consider how this affects the readability of the site for someone who requires enlarged text.

Ensure that the content is understandable without any presentation mark-up.

The easiest way to look at the order of content on a page is to use the browser to save the page as a text file (i.e. as a .txt only not .doc). Then view the file and decide whether you need to make any adjustments so that your page is understandable without specific presentation mark-up.

Section 3. Text descriptions for images

Description

Implementation and appropriate use of various tags or attributes for images.

How to gain full marks for the precept.

Images can be made accessible to those using non-graphical browsers (text only) or those with impaired sight who use screen readers, by providing 'alternative' text which aims to provide equivalent information to the user that is presented visually by the image. Every single image must have an ALT description tag giving equivalent functional, descriptive or contextual information in a clear text format. However if an image has no significant meaning then it must been given an empty ALT tag in preference to no ALT tag. When the site is viewed without pictures it must have as much information and be as easily accessible as the graphic version.

Simple pictures / images

Photographs, graphics or images, which are there only to show a simple visual point can be made accessible by using the ALT attribute within the IMG (image) tag.

Complex pictures, diagrams and charts

For diagrams and pictures represented by a complex image you may need to provide more information than can be given in a short ALT tag. There are three methods for providing this information:

1. Provide a description on the image contents within the general text, giving all the information and detail need for comprehension in the absence of the image.
2. Use a "D" link , which is a letter "d" or link title such as link to a description of the image?, which is positioned after or next to the image. This "D" link, hyperlinks to a separate page or text file containing a full description of the image.
3. The LONGDESC attribute can be used to link from the image itself to a description of the image on another page.

Note: The "D" can in fact be a small transparent image that is hyperlinked to the description and also have a LONGDESC to the same description. These are not visible to the visual user but can be read aloud by a screen reader.

Try to add the dimensions of the image so that when the page loads, the browser leaves space for the image to load without affecting the visual presentation.

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Presentation / design or spacer images

If images are used purely to provide better structure or as a visual design element that has no intrinsic meaning then a user's browser should be given this information. This can be done by using an empty ALT attribute within the image tag. (Note that there is no space placed between the opening and closing inverted commas.)

<IMG src="images/sce/border.gif" alt="">

If an image is used in place of a text header, icon or as a logo then this information should be given using the ALT tag.

Bullet or list point images

If images are used in place of standard bullet list points then these should be given the alternative text information. This can be done in different ways:

1. For short lists the most appropriate ALT tag would be alt="" so as not to distract the user from the content.
2. For unordered lists use the Image ALT attribute "bullet" or (asterisk) "*".
3. For ordered lists you could provide numbered or sequentially labeled bullet points so that extra information can be provided for a text only user but would superfluous to a visual user.

Examples: http://www.starlingweb.com/acc/acbul.htm

Navigation or functional hyperlinks using images.

If images are used as navigation hyperlinks or as functional buttons (e.g. a form submit button) then the equivalent text information should be given for the image or an alternative method of navigation (activation) should be provided.

The ALT description tag information should give the user the 'functional' text equivalent in place of a description of the image. For example, specifying "forward arrow" or "back arrow" rather than "red arrow" as that does not tell the user in which direction he/she is going or act as a navigational cue.
If hyper linked images are given in sequence with no space, for example in a navigation bar, then you must remember that if the ALT tags are shown/provided in place of the image, the ALT tag's will have no space either. This can be overcome by:

- placing a space after the alternative text and before the closing inverted commas (e.g. alt="text ")
- enclosing the ALT description in brackets (e.g. alt="[text]")
- adding a space and a printable character after the text (e.g. alt="text |")

This is essential to aid the user of a screen reader with an understanding of the links as they are read aloud.

Ensure meaningful site content without images

WAVE is a very useful tool to view your page with the image ALT tags highlighted and the reading order shown. (http://www.temple.edu/inst_disabilities/piat/wave/)
Use a Text only browser such as Lynx or an emulator to view your web page. You can either download a copy of the lynx browser (http://lynx.browser.org) or use lynx simulators (http://www.miranova.com/%7Esteve/Lynx-View.html) to view single pages. Your site should aim to provide the same information and functionality to text only users that it does to graphical browser users.

Tip - View your website without images. One way to assess the usability of a site without the benefit of sight or a graphical browser is to 'turn off' your images and replace them with the alternative text. This will hopefully show you whether your choice of alternative text for the images within the context of the site was appropriate. Your site should aim to provide the same information and functionality to text only users as it does to graphical browser users.

To turn off images in IE:

- Use Tools/Internet Options/Advanced
- In "Accessibility" check "Always expand alt text for images."
- In "Multimedia" check "Show image download placeholders."
- In "Multimedia" uncheck "Show pictures."

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Use the "Restore Defaults" button on the Advanced page when you want to return to viewing images.
To turn off images in Netscape, use Edit/Preferences/Advanced:

- Uncheck "Automatically load images."
- Clear memory cache and clear disk cache in Edit/Preferences/
- Advanced/Cache to see recently viewed pages without images.
- Reverse the procedure when you want to return to viewing images.

Putting information onto the web from paper-based materials should not be a matter of just typing the text up on to a large page. The nature of the web means that it is more than a two-dimensional medium like paper. It has the advantage of being able to hyperlink within and between pages, but has the disadvantage that one cannot simply flick through and turn the pages.

Just like a printed document, one must consider the readers and at what level the content should be pitched taking into account the assumed knowledge and likely comprehension levels of the user. The information should be broken down into manageable chunks that are presented and laid out into recognizable and navigable sections. Limit the use of metaphors, particularly in headings because readers might read these literally.

Seventy-nine percent of Web users scan pages; they do not read word-for-word. To make keywords stand out, use **highlighting** liberally. You can highlight about three times as many words as you would when writing for print. You should highlight only key information-carrying words. However, do not highlight or underline entire sentences or long phrases as these can be distracting to the reader.

The W3C recommends that you use the STRONG tag rather than the EM tag for keyword highlighting, since it is usually rendered in a **bold** typeface. Punctuation helps structure documents for a screen-reading device so make sure that all your sentences, paragraphs, headers, titles, and list items do have 'full stops' or other punctuation marks.

Paragraphs and Headers

Paragraphs

Try to leave space between paragraphs. There should be more space between paragraphs than between lines. It is advised that for any given web page, it should contain 50% of content based on size in comparison to a printed page. Readers can benefit from indenting the first line or using a bullet or asterisk.

SEVENTY-NINE PERCENT OF WEB USERS SCAN PAGES; THEY DO NOT READ WORD-FOR-WORD. PEOPLE READ A WEB PAGE APPROXIMATELY TWENTY-FIVE PERCENT SLOWER THAN A PRINTED PAGE..

Try to express one idea per paragraph providing ideas in order of importance if at all possible. The paragraphs should be grouped under section headers to help the user navigate around the page content.

It can be helpful to start the page with a short conclusion or summary of the remaining contents ("inverted pyramid" style).

Headings

Headings should be clearly differentiated from the main text using some combination of size, weight or font and space.

Do' s

- Aligning headers to the left makes reading easier for many users.
- Make sure that headings clearly indicate the content of the sections.
- Make sure that there is enough space between the header and main contents.

Don'ts

- Over use clever headings as users rely on scanning to pick up the meaning of the text.
- Use capitals or italics for headings
- Out-denting the first line as this can be very distracting to a reader.

Words and Sentences

Researchers have found that people read a Web page approximately twenty-five percent slower than a printed page, which means that less information should be presented on each web page (approximately half) that of a printed page.

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Users don't like to scroll through masses of text, so break the information down and put the most important information at the top.

Sentences should ideally be in the range of 50-65 characters. Some visually impaired people may prefer even shorter lines than this. Use simple sentence structures: Convoluted writing and complex words are even harder to understand online.

Avoid splitting words at the ends of lines and do not hyphenate words which wrap round in text boxes. Text in all-capitals is much harder to read than normal-case continuous text. However, one or two words set in capitals do not usually create reading problems.

Use unjustified, ragged right, text setting with even word spacing. Do not justify text as this creates uneven word spaces and makes the text harder to read.

Clear Language and Effectiveness Tool (CLAD)

You can download a copy of the Clear Language and Effectiveness Tool (http://www.eastendliteracy.on.ca/clearlanguageanddesign/readingeffectivenesstool/) to check the 'readability' of the text on your pages you could use the CLAD tool. This tool asks a series of questions about a portion of the text, then using client-side scripting, calculates a reading level and gives some indication of its 'readability'.

Alternative ideas for presenting information

- Flow charts are ideal for visually explaining procedures.
- Pictograms and graphics help to locate information.
- Lists of 'do's and 'don'ts' are more useful than continuous text to highlight short points.
- Provide a glossary of abbreviations and jargon.

Remember to provide text only alternatives.

Recognized conventions

- Try to use the common language conventions of the web such as the word 'homepage' rather than 'reception' for the front or first main page of the site.
- Using a hyperlinked contents list at the beginning of a page is a good way of showing what the page contains and allows the user to instantly recognize the format of the page.

Lists, Hyperlinks and References

Lists

- Bullet point and numbered lists slow down the reader and can be used to show clear short points.
- Try to use numbered lists when the order of entries is important. Use unnumbered lists whenever the sequence of the entries is not important.
- Generally limit lists to no more than two hierarchal levels.

Hyperlinks

- Don't use a hypertext link if the information can be succinctly presented on the current page.
- Do use hyperlinks to provide supplemental information like definitions of terms and abbreviations, reference information, and background reading.

References

If using cross-references, try not to clutter the page but instead put them at the bottom of a page, similar to a printed page footer under a "See also" (or similar) heading where appropriate. Generally, such lists of cross-references are easiest to read if they include only headings or titles with a few words of explanation but with a link for further detail.

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Characters used as visual cues and ASCII text

Some people use characters which when put together have a visual meaning, such as (==>) to represent and arrow with brackets or the more common 'similes' such as :-) which would be read out loud by screen readers as "colon-hyphen-parenthesis". Try not to use these instead write equivalent text .
ASCII text diagrams (e.g. http://www-personal.engin.umich.edu/~saha/ASCII.html).
These are diagrams or charts whose image is made up of a number of characters. Equivalent content should be provided for screen reader users in the same way you would with a standard image.

Use of ABBR and ACRONYM mark-up

Try to provide the meaning of acronyms used within the site. For example JCALT would become an unpronounceable nonsense word if read aloud by a screen reader.
Welcome to the
<ACRONYM title="Joint Committee for Awareness Liaison and Training"> JCLT</ACRONYM> web site.

Try to provide full versions of abbreviations using the ABBR tag.
It took exactly 110 <ABBR title="milliseconds">ms</ABBR>.
For sites that contain many abbreviations or acronyms, a separate page can be used to list them and their long versions.

Specifying a Natural language / Language mark-up

Try to avoid, wherever possible, the use of bilingual text on a page as this can cause problems for screen readers. Instead create separate English and French versions of pages. When you must create a bilingual page, such a showing an extract from a famous piece of foreign literature, keep the amount of text to a minimum and be sure to provide links to the text in the user's language of choice.

Small quotes or phrases in foreign languages should be marked-up using the SPAN and LANG attribute.

```
<P LANG=en>This paragraph is in English.
<P LANG=es> Este párrafo está en español
```

Each document should be marked up with a language within the Document Type. For more information on choosing a DOCTYPE see http://www.htmlhelp.org/tools/validator/doctype.html.

For example this DocType shows a strict conformity to HTML 4.0 and the Use of English as the main language.

```
<!DOCTYPE HTML PUBLIC "-//W3C//DTD HTML 4.0//EN"
  "http://www.w3.org/TR/REC-html40/strict.dtd">
```

Accessible issues regarding media types

Description

Providing accessible media (e.g. video and audio files), accessible documents formats (e.g. PowerPoint and PDF document files).

How to gain full marks for the precept.

Provide alternative pure text or data material for users who may be text-only users or whose systems do not support multimedia.

We have made a review of the following sections below:

- Audio and Video files: Provide alternative text transcripts and captioning, indicate the format and file size.
- Acrobat PDF and Postscript files: Provide the documents in alternative formats (E.g. MS Word or preferably RTF) and include a link to Access Adobe.

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- Flash, Fireworks and QuickTime: Avoid the use of new Multimedia formats unless you can ensure accessibility.
- Mathematics, Equations, and symbols: If possible use MathML instead of images, or provide alternative text or audio based descriptions.
- Microsoft's Document Formats (PowerPoint, and Office HTML): Manually mark-up the material in html in preference to using the 'save to HTML' in an Office application.

Audio and Video files

Give a written description of any critical information contained in audio or video files on your Web page. If you link to an audio or video file, indicate its format (.WAV, .AU, MP3, WMP etc.) and file size in kilobytes (no one wants to download a 100K byte file and then learn they can't play it on their system).
Real Player can be used to create captioned video images. For more information see the Real Video authoring site (http://www.realnetworks.com/products/authkit/index.html).

A transcript or description can be located on a separate page that is linked to the clip. As these types of data are likely to be embedded using the OBJECT element, you can also include text that is shown by the browser if it does not support the OBJECT. This text can be included between the <OBJECT></OBJECT> tags.

For further information on accessible multimedia see WAI's Accessibility Features of SMIL located at (http://www.w3.org/TR/SMIL-access). This is a detailed technical discussion of features in W3C's Synchronized Multimedia Integration Language (SMIL) that support accessibility of multimedia, and how to implement those features in multimedia players, multimedia-authoring tools, and in the development of multimedia content.

Adobe Acrobat PDF and Postscript files

If documents are provided in Portable Document Format (PDF), ensure that HTML or plain text versions are also available. You should also consider how to make any charts or graphs in the PDF file accessible.

When using a PDF file you should provide a link to Adobe's Accessibility Page (http://access.adobe.com) where the user can download an accessibility plug-in for their browser or produce a reformatted document using an on-line form (PDF to HTML http://access.adobe.com/simple_form.html) or (PDF to TXT or HTML http://www.pdfzone.com/services/access.html).

It is much more preferable to produce the simple text file yourself because the reformatting is not as graceful as if done manually. For instance complex tables and columns become 'jumbled'.
Most PDF (version 5) documents are now accessible using the latest version of JAWS (a screen reader). Older PDF versions of your own documents should preferably be converted into the newer format.

When PDF documents are created be aware that if you are simply going to scan a page into the document then you are effectively giving the user a large picture of the text, which will mean that the resulting PDF will be inaccessible whatever they do. Always keep your original documents in a basic format so that if a user requests the material in an accessible medium, you can easily covert the file.

Flash, Fireworks and QuickTime

New multimedia or design formats are always in development but their accessibility options usually take a considerable amount of time to filter into the mainstream.
Try to avoid their use but if you feel it necessary, always provide a 'skip file' link so that the user is not burdened with an inaccessible format that may take ages to download. Preferably offer users a Flash or Html No-Flash option.

When using browser detection scripts don't assume that because someone is using, for example, Internet Explorer 5 with Flash installed, they can actually access material presented in a Flash movie, and therefore route them automatically to a Flash version of a page. Some access software works in conjunction with a "standard" browser but is unable to translate and present to the user everything that the browser itself is able to handle. Always ensure that the user has some means of selecting how a page will be presented (e.g. by offering a choice between a Flash and a non-Flash version of a page).

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For further information

Macromedia Flash Accessibility Guidelines & Techniques
http://www.macromedia.com/software/flash/productinfo/accessibility/guidelines/
http://www.macromedia.com/software/flash/productinfo/accessibility/flash_techniques/
http://www.macromedia.com/software/flash/productinfo/accessibility/
Macromedia Accessibility Tools
http://www.macromedia.com/macromedia/accessibility/tools/contents.html
Dreamweaver's Evaluation Tool for Accessibility
http://dynamic.macromedia.com/bin/MM/exchange/extension_detail.jsp?product=dreamweaver&extOid=195842
Macromedia Fireworks
http://dynamic.macromedia.com/bin/MM/exchange/dreamweaver/extension_detail.jsp?extOid=118348
Flash OBJECT and EMBED Tag Syntax
http://www.macromedia.com/support/flash/ts/documents/tn4150.html

Searching and Search Engines

Try to provide a search engine for your site as it may help users locate particular information quickly.
If possible when using search engines:

- Always put the search box in a clear obvious position, usually the top of the page.
- Try to limit the search or provide 'search with results' so that the user is not over burdened with too many results.
- Make the links to 'next page' (sometimes numerals) clear and obvious
- Provide the title of each search page and its URL
- Offer a search engine that is forgiving of spelling errors.
- Inform users when they have entered nothing in the search or query box.

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SECTION 4: PREPARING WEB ACCESSIBILE CONTENT

To ensure that visitors to your website have the ability to control us ability features, it is always suggested that font sizes be specified in terms of Elements (em).

So what exactly is an em? The em unit traces its origin to the em box as used in print typography. The actual spatial rendering of an em is dependent on the glyphs of the font used. As such there is naturally a great deal of variance. The "1 em" spatial representation of an upper case letter X of the Courier font will be decidedly different from the rendering of the same upper case letter X of the Verdana font.

Though at first thought it may seem confusing it is not. An "em" unit or "1 em" displays at the default or "base" size for a rendered font glyph as contained within an HTML element where the default display is assigned by the user agent. Generally speaking, text styled with a font-size 1 em {font-size: 1em;} will display as if no size declarations were assigned. Font-size "1 em" headers, sub-headers, paragraphs and other *user-agent display controlled elements* will all render at the default user-agent-determined settings.

Some designers feel the "default font-size" assigned by user-agents is too large. Declaring a smaller than "1 em" font-size for body text is a simple thing. A popular "em-size" for body text is {font-size: 0.8em;} which generally renders as the equivalent of 11px (11 pixels).

Most of the confusion and difficulties when first using "em" results when the declared "font-size" of the parent element is overlooked. Used correctly, the .em is an ideal font-size unit of measure. Pixel units are relative to the resolution of the viewing device, i.e., most often a computer display. If the pixel density of the output device is very different from that of a typical computer display, the user agent should rescale pixel values. It is recommended that the reference pixel be the visual angle of one pixel on a device with a pixel density of 96dpi and a distance from the reader of an arm's length. For a nominal arm's length of 28 inches, the visual angle is therefore about 0.0213 degrees. A single pixel viewed in that reference frame would approximate 0.26mm in length. Pixel units are relative to the resolution of the viewing device... With this in mind, .px may be the most *portable* unit of measure across *devices*.

In conclusion, pixel (.px) sized fonts offer reliable control and consistent scaling across devices. A 12px font size will always retain the same relative scale to a 16px font when displayed on the same device and active resolution. The em unit scales consistently as well and has the added advantage of allowing the end-user to adjust the text size through settings available on a particular user agent.
Em is used almost exclusively throughout this site because of its accessibility (text-resizing) advantage.

PIXEL UNITS ARE RELATIVE TO THE RESOLUTION OF THE VIEWING DEVICE...

The following topics do require some familiarity with CSS. Useful CSS tutorials can be found all over the Web, but an especially useful resource can be found at http://www.w3schools.com.

Defining Classes or Identifiers?

When choosing the option to use class names or identifiers within your stylesheets, you will need to establish its use. Classes are used to describer the appearance of HTML objects and how they are presented on a Web page. Identifiers can also be used to describe the appearance of HTML objects, but they can also be referenced by other sources such as JavaScript. Classes can also be used to define individual elements within an identifier. For example:

```
<div id="content"><p class="text">A sentence or two</p></div>

#content .text { position: relative; top: 5px; left: 10px; float: left; height: 200px; min-height: 200px; margin: 1em 0.5%; border: 0.5em solid brown; padding 4em; width: 32%;  font: bold 1em Verdana;}
```

CSS Tips and Workarounds

1. CSS font shorthand rule

When styling fonts with CSS you may be doing this:

font-weight: bold;

font-style: italic

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font-variant: small-caps;

font-size: 1em

line-height: 1.5em

font-family: verdana,sans-serif

There's no need though as you can use this CSS shorthand property:

font: bold italic small-caps 1em/1.5em verdana,sans-serif

Just a few words of warning: This CSS shorthand version will only work if you're specifying both the font-size and the font-family. The font-family command must always be at the very end of this shorthand command, and font-size must come directly before this. Also, if you don't specify the font-weight, font-style, or font-variant then these values will automatically default to a value of normal, so do bear this in mind too.

2. Two class together

Usually attributes are assigned just one class, but this doesn't mean that that's all you're allowed. In reality, **you can assign as many classes as you like**! For example:

...

Using these two classes together (separated by a space, not with a comma) means that **the paragraph calls up the rules assigned to both text and side**. If any rules overlap between the two classes then the class which is below the other in the CSS document will take precedence.

3. CSS border default value

When writing a border rule you'll usually specify the color, width and style (in any order). For example, border: 3px solid #000 will give you a black solid border, 3px thick. **However** the only required value here is the border style.

If you were to write just border: solid then the defaults for that border will be used. But what are the defaults? The default width for a border is medium (equivalent to about 3 to 4px) and the default color is that of the text color within that border. If either of these is what you want for the border then you can leave them out of the CSS rule!

4. CSS document for printing

Lots of web pages have a link to a print-friendly version. What many of them don't realize is that there's no need because you can set up a **second CSS document** to be called up when a user prints the page.

So, your page header should contain links to two CSS documents, one for the screen, and one for printing:

<link type="text/css" rel="stylesheet" href="stylesheet.css" **media="screen"** />
<link type="text/css" rel="stylesheet" href="printstyle.css" **media="print"** />

The first line of code calls up the CSS for the screen (notice the inclusion of media="screen") and the second line calls up the CSS for the printable version (using media="print").

So, what commands should you put in this second CSS document? To work it out, open a blank document and save it as printstyle.css. Next, point the screen CSS command to this document so that the command reads: <link type="text/css" rel="stylesheet" **href="printstyle.css"** media="screen" />.

Now just keep entering CSS commands until the display on the screen matches how you want the printed version to look. You'll certainly want to make use of the **display: none command for navigation, decorative images and non-essential items**.

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5. Centre aligning a block element

Say you wanted to have a fixed width layout website, and the content floated in the middle of the screen. You can use the following CSS command:

```
#content
{width: 700px;
margin: 0 auto
}
```

You would then enclose around every item in the body of the HTML document and it'll be given an automatic margin on both its left and right, ensuring that it's always placed in the centre of the screen. Simple... well not quite - we've still got the pre-IE 6 versions on PC to worry about, as these browsers won't centre align the element with this CSS command. You'll have to change the CSS rules:

```
body
{
text-align: center
}

#content
{
text-align: left;
width: 700px;
margin: 0 auto
}
```

This will then centre align the main content, but it'll also centre align the text! To offset the second, probably undesired, effect we inserted text-align: left into the content div.

6. Vertically aligning with CSS

Vertically aligning with tables was a rather simple. To make cell content line up in the middle of a cell you would use vertical-align: middle. This doesn't really work with a CSS layout. Say you have a navigation menu item whose height is assigned 2em and you insert this vertical align command into the CSS rule. It basically won't make a difference and the text will be pushed to the top of the box. You will also need to specify the line height to be the same as the height of the box itself in the CSS. In this instance, the box is 2em high, so we would insert line-height: 2em into the CSS rule and the text now floats in the middle of the box - perfect!

7. CSS Positioning within a container

One of the best things about CSS is that you can position an object absolutely anywhere you want in the HTML document. It's desirable to position objects within a container which is relatively simple to do.

You can assign the following CSS rule to the container:

```
#container
{
position: relative
}
```

Now any element within this container will be positioned relative to it. Say you had this HTML structure:

```
<div id="container"><div id="navigation">Content For Navigation</div></div>
```

To position the navigation exactly 45px from the left and 20px from the top of the container box, you could use these CSS commands:

```
#navigation
{
position: absolute;
```


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```
left: 45px;
top: 20px
}
```

8. Background color running to the screen bottom

One of the disadvantages of CSS is its inability to be controlled vertically, causing one particular problem which a table layout doesn't suffer from. Say you have a column running down the left side of the page, which contains site navigation. The page has a white background, but you want this left column to have a blue background. Simply, you would assign it the appropriate CSS rule:

```
#navigation
{
background: blue;
width: 150px
}
```

If the navigation items do not continue all the way to the bottom of the screen, neither will the background color. The blue background color will then be cut-off half way down the page and disturb the rest of your design.

One method around this issue would be to assign a background image to the body HTML element which should be the same color and same width as what has been defined in the CSS id.

Your CSS will then also include:

```
body
{
background: url(images/sce/bluebackground.jpg) 0 0 repeat-y
}
```

The disadvantage here is that you can't express the left column in terms of em, if a user were to resize the text, the column would expands, but it's background color would not.

Using this method the left column will have to be expressed in px if you want it to have a different background color to the rest of the page.

ONE OF THE DISADVANTAGES OF CSS IS ITS INABILITY TO BE CONTROLLED VERTICALLY…

Creating a Box (1 column 1 row Table)

To restrict content to a confined area we can simply add a single div element in which we would then add our content. A class or an identifier will be assigned to the div element in order to call the CSS command which in the example below is a box which is 32% of the screen width.

The CSS code:

```
.box {position: relative; top: 5px; left: 10px; float: left; height: 200px; min-height: 200px; margin: 1em 0.5%; border: 0.5em solid brown; padding 4em; width: 32%}
```

The HTML code:

```
<div class="box">your text in here</div>
```

Creating a Table Structure without Tables (3 columns 3 rows)

One of the most difficult aspects of writing content for Web Accessibility is the ability to layout your Web pages without using tables. Table data may not be read correctly by screen reader users, as a flow has not been defined as it would if a user was visually interpreting a table. However, through the use of HTML and CSS, we can present content in a format which would appear visually in a table format and would be received in an auditory sense for screen reader users.

A sample of a typical 3 x 3 table has been provided below by using HTML and CSS.

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```
#header {border: 1em solid red; height: 3em}
#content {padding: 0.5em; margin: 0 15em; margin-left: 15em; border: 0.1em solid blue; height: 20em; background-color: #FF6666}
#nav {padding: 2em; float:left; width: 13em; border: 0.1em solid yellow}
#news {float:right; width: 13em; border: 0.1em solid yellow; padding: 0.1em}
#footer {clear: both; border: 1em solid green; height: 3em}
#container {float: right; width: 100%; margin-left: -14em; border: 0.1em solid orange}
#container2 {float: left; width: 100%; margin-right: -14em; border: 0.1em solid purple}
#nav ul {list-style: none; padding: 0; margin: 0}
<div id="header">header header header header</div>
<div id="container2">
<div id="container">
<div id="content">content content content content content content</div></div>
<div id="nav"><ul><li><a href="#">Home</a><li><br/><br/><a href="#">About Us</a><li><br/><br/><a href="#">Products</a><li><br/><br/><a href="#">Press Room</a></ul></div>
</div>
<div id="news"><h4>Today's News</h4><br/>news news news news news news news news news news news news news news news news news news</div>
<div id="footer">footer footer footer footer footer footer</div>
```

Writing effective ALT text for images

People who are aware of Web accessibility know that images need alternative, or ALT, text assigned to them. The reason ALT text is used is because screen readers cannot announce images, but rather read aloud the ALT text which has been assigned to them. Internet Explorer will show the ALT text when a user mouses over an image in a yellow "tool-tip" box. Other browsers on the other hand will not show the ALT text on mouse-over of an image, which is the correct interpretation.

To assign ALT text to an image, the HTML would look like:

<img src="images/sce/imagename.gif" alt="Alternative description goes here">

When using the Site Content Editor and inserting images, you can insert your ALT text into the "Alt" field which is available on the "Insert Image dialogue box".

A few guidelines have been provided below to assist you in writing effective and clear alternative text.

Spacer images and missing ALT text

Spacer images are invisible images that the majority of Web designers use to layout Web pages. The purpose is to create space on the page as sometimes it's not possible to create the visual display you need.

Spacer images should always be assigned a null value for ALT text, or alt="". Most screen readers will then completely ignore the image and won't announce its presence.

Bullets and icons should be treated in much the same way as spacer images. Icons, usually used to complement links, should also be assigned alt="".

Many websites use the link text as the ALT text of the icon. In this example, if the icon was assigned alt="our company". Screen readers would announce the ALT text first, and then the link text, so would say "our company" twice.

(Ideally, bullets and icons should be called up as background images through the CSS document - this would remove them from the HTML document completely and therefore remove the need for any ALT description.)

Aesthetic images

Aesthetic images should be assigned a null value for alternative text, or alt="". If an image purely aesthetic and eye pleasing then there should be no need for a screen reader user to even know it exists and be informed of its presence. Simply put, it adds to the noise pollution and discourages the visitor.

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On the other hand, one may argue that images within a website create an identity for the company and hiding them from screen reader users will deny this group the experience that non screen reader users will receive.

Navigation and text embedded within images

Navigation menus that require aesthetic text haven't a choice but to embed the text within an image. In this case, ALT text should not be used to add a more descriptive detail to the image. ALT text should not be used as filler or for Search Engine Optimization (SEO). For example, rather than using 'carpet restoration, carpet cleaning, carpet installation' for a menu item that says, 'Our Services' the ALT text should only read 'Our Services'. ALT text should always describe the content of the image and should only repeat the text as-is.

The same applies for any other text embedded within an image. The ALT text should simply repeat, as-is, the text that embedded within each image.

(Unless the font being used is especially unique it's often unnecessary to embed text within images - advanced navigation and background effects can now be achieved with CSS.)

Company logo within the header

Websites tend to use ALT text descriptions when it applies to logos. The majority of websites will assign ALT text to say, '*Company name*', others '*Company name logo*', and few others may describe the function of the image (usually a link back to the homepage), '*Back to home*'. ALT text should always describe the content of what the image is, so in the first example, alt="Company name", is probably most effective way to describe the image. If the logo is a link back to the homepage then this can be effectively communicated through the title tag.

Writing effective ALT text is rather simple. ALT text should only be used to describe the image and nothing more. If it's a decorative image which does not relate to the content, then a null value for alternative text, or alt="" should be used. The ALT attribute should never be omitted. If the image contains text then the ALT text should simply repeat the text.

Also be sure to keep ALT text as short and concise as possible. Listening to a Web page using a screen reader takes much longer than traditional means, so try not to disturb the surfing experience by using distended and unnecessary ALT text.

When creating accessible websites, most Web developers will follow the W3C accessibility guidelines. All products and solutions offered by Voloper Creations Inc. meet Priority Levels 1 and 2 of the W3C Web Accessibility Initiative.

... KEEP ALT TEXT AS SHORT AND CONCISE AS POSSIBLE.

To really ensure the accessibility of your website, you can implement some of the following techniques:

General Text

Hidden Text

Hidden text can be very useful for screen reader users. If there isn't sufficient text for these users to gain an understanding of a particular section, then you can simply create this extra information and hide it from sighted users.

The most common and useful page items to insert invisible text for screen reader users include:

Headings

Every single section on each page should have a heading placed immediately before it. This way, screen reader users always know that the preceding section has finished and a new section has begun. So, before the main navigation begins, you should insert a heading labeled, 'Site navigation'. Although this heading is extremely useful for screen reader users, it may look rather unsightly visually, so you can just make the text invisible.

Form labels

Every form item must have a label immediately preceding it - otherwise, screen reader users won't know what the form item is about. Date of birth fields, with three separate fields for date, month and year, are common culprits of not providing form labels for each form field. So, place the date of birth

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label before the three form fields, and then insert an invisible label before each of the other two form fields, 'Month of birth' and 'Year of birth'.

Skip links

A skip link is an invisible link that's placed at the very top of the HTML file. It's a relative link within the page, allowing users to jump straight to a section on the page, usually the main content. Skip links are really useful for both screen reader and keyboard-only users who can jump straight to the content, without having to work through the navigation.

Making text invisible is very simple. Create the following CSS rule:

```
.invisible {
position: absolute;
left: -11000px;
}
```

Then, just assign class="invisible" to any text that you want to make invisible.

Concise, Front-loaded and Conventional link text

As a method of browsing through a page, screen reader users can call up a list of links on a page and jump to the link that they are most interested in.

It's common knowledge that link text should make sense out of context, and this is indeed a W3C guideline. Link text such as 'Click here' would obviously make no sense in a list like this. It's also crucial that link text is:

- **Concise** - so that it's quick and easy for screen reader users to work through this list
- **Front-loaded** - so that screen users can understand the meaning of the link straightaway and jump down to the next one if they're not interested
- **Conventional** - so screen reader users can alphabetize the list and jump to the link they're looking for (e.g. if the 'Contact us' link was labeled as 'Enquiries' it would be harder to find the website's phone number)

HEADINGS ARE IMPORTANT FOR ALL USERS TO FIND WHAT THEY'RE LOOKING FOR EFFECTIVELY AND EFFICIENTLY.

Link text is additionally important for users that find it difficult to read online, such as screen magnifier users and those with learning difficulties and dyslexia. For these users when they scan through Web pages, they'll often be unable to make out specific words - instead, they'll see shapes and colors. Anything that's in a high contrast color is obviously a link, so they can stop and read it.

By making link text succinct and front-loaded, and using conventional link text, it's far easier for users that find it difficult to read online to immediately comprehend links and what their destination is.

Place instructions first

If you plan to provide instructions for functionality on your website, ensure that the instructions are placed before the functionality appears.

Screen reader users listen to pages in the order that they are written, so if instructions were to come after what they are relating to, then the functional aspect of your site is lost.

Placing instructions before functionality is also crucial for users who use screen magnifiers. Screen magnifier users can only see a limited section of the screen at any time. If instructions are placed in an out-of-the-way they will likely be overlooked.

Web forms are perhaps the most common type of functionality to contain instructions. Do be sure that any instructions are placed above the form and not below it.

Large headings

Headings are important for all users to find what they're looking for effectively and efficiently. They are particularly

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useful for any Web user that finds it difficult to read on a computer, such as screen magnifier users and those with learning difficulties and those who may be dyslexic.

When these users read through Web pages, they'll often be unable to pick up words and instead will see shapes and colors. Using a large font size for headings will ensure that these users will easily be able to spot headings, thus increasing the usability of your website.

Focus state for links

Keyboard-only web users can navigate through Web pages by using the tab button, going from link to link (and form label to form label). It can sometimes be difficult to know exactly where you are on the page when relying on the tabbing method. By assigning a background color to the focus state of each link, it becomes much easier for these users to no where about they are on the page.

This is really simple to achieve through the following CSS rule:

```
a:active, a:focus {
background: yellow;
}
```

Large link target

Numerous Web users with dexterity issues will only tend to use the keyboard to browse through a website. A mouse may still be used by the user, but with rather limited control, so wherever possible, try to increase the area of the link target. This is of course not possible for regular links, but for vertical navigation lists, it's easy to extend the clickable area to the full width of the column by assigning the style, "display: block" to each link or assign this as an identifier within a div element and surround the navigation with the div.

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SECTION 5: ADDITIONAL WEB ACCESSIBILITY RESOURCES

About the W3C Web Accessibility Initiative

W3C's Web Accessibility Initiative (WAI) addresses accessibility of the Web through five complementary activities that:

- Ensure that the technology of the Web supports accessibility
- Develop accessibility guidelines
- Develop tools to facilitate evaluation and repair of Web sites
- Conduct education and outreach
- Coordinate with research and development efforts that may affect accessibility of the Web

WAI's International Program Office enables partnering of industry, disability organizations, accessibility research organizations, and governments interested in creating an accessible Web. WAI sponsors include the US Department of Education's National Institute on Disability and Rehabilitation Research; the European Commission's Information Society Technologies Programme; Government of Canada, Industry Canada; Foundation ONCE, HP, IBM, Microsoft Corporation, SAP, Verizon Foundation, and Wells Fargo. Additional information on WAI is available at http://www.w3.org/WAI/.

About the World Wide Web Consortium (W3C)

The W3C was created to lead the Web to its full potential by developing common protocols that promote its evolution and ensure its interoperability. It is an international industry consortium jointly run by the Computer Science and Artificial Intelligence Laboratory (CSAIL) at Massachusetts Institute of Technology (MIT) in the USA, the National Institute for Research in Computer Science and Control (INRIA) in France and Keio University in Japan. Services provided by the Consortium include: a repository of information about the World Wide Web for developers and users; reference code implementations to embody and promote standards; and various prototype and sample applications to demonstrate use of new technology. For more information about W3C, see http://www.w3.org/.

For More Information

The WAI website, http://www.w3.org/WAI/ provides guidelines @ http://www.w3.org/WAI/guid-tech and resources @ http://www.w3.org/WAI/Resources/ to help make the Web accessible. These range from very short summaries, such as 'Quick Tips to Make Accessible Web Sites' @ http://www.w3.org/WAI/References/QuickTips/ to resources on managing accessibility @ http://www.w3.org/WAI/Managing to detailed technical references @ http://www.w3.org/TR/tr-activityWAITechnicalActivity.

Related resources for making the Web accessible are also available from other organizations, and many can be found on the Web.

Terminology

Web "content"

Web Content generally refers to the information in a Web page or Web application, including text, images, forms, sounds, and such. More specific definitions are available in the WCAG documents, which are linked from the Web Content Accessibility Guidelines (WCAG) Overview @ http://www.w3.org/WAI/intro/wcag.

Web "software"

Web software includes:

- **Web browsers**, media players, and other "user agents"; for more information, see 'User Agent Accessibility Guidelines (UAAG) Overview' @ http://www.w3.org/WAI/intro/uaag

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- **Authoring tools** that creates Web sites; for more information see, 'Authoring Tool Accessibility Guidelines (ATAG) Overview' @ http://www.w3.org/WAI/intro/atag

- **Evaluation tools** that determine if a Web site meets standards and guidelines; for a list of accessibility evaluation tools, see 'Evaluation, Repair, and Transformation Tools for Web Content Accessibility' @ http://www.w3.org/WAI/ER/existingtools

People with disabilities sometimes use other software, called **assistive technologies**, to interact with the Web.

Obtaining Additional Information

You should find that the World Wide Web Consortium will have the most update information and useful resources regarding Web Accessibility, from the issues surrounding accessibility through to how to develop Web accessible designs and content. There are also numerous tutorials available for HTML and CSS development for beginners to advanced users.

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