How to create accessible digital content: a guide for service providers

This e-learning module is an integrated, continuing education course by the Canadian Hard of Hearing Association (CHHA). This module provides information on how organizations can create accessible websites and online media, outlining best practices developed through [W3C Web Content Accessibility Guidelines](#). The World Wide Web Consortium (W3C) has guidelines that are being followed by many regional jurisdictions, and if your organization follows these, it is likely aligned with practices elsewhere.

The need for accessible media

Having an accessible website and content/media isn't just good practice, it's a necessary step that increases the reach of an organization, and benefits all users. For example, providing accurate captions for video and transcripts for audio recordings doesn't just benefit those who live with hearing loss. It is also useful for:

- second language users,

- those who live with other types of disabilities,

- many of the general public who may

    - be experiencing a temporary challenge,

    - in a noisy, or quiet, shared environment, or

    - want to know the spelling of a rapid, unfamiliar or complex utterance.

This e-learning module will examine how you can develop web content that is accessible, with further examples.

Posting Online Video

There are two important features that should be included for accessibility: captions and transcripts. Captions help those who cannot follow the audio information in the video (including who said what, and noises), and a transcript helps those who cannot listen to audio-only media.

Other accessibility considerations are video description and sign language interpretation. Video description makes visual content available to those who can't see it. Sign language interpretation makes content available to the Deaf, for whom sign is a first language[i].

When posting video online, make sure that your media player is keyboard accessible. This means you can use it without touching your mouse. Many people can't use a mouse, and being able to use the keyboard ensures that they can access all of your content.

Setting up captions on your videos

If your organization will be posting any video online, it's not only a good idea to include captions – it may be the law in your jurisdiction. Captions help more people than just those who live with a hearing loss – they also help:

- viewers who use English as a second language benefit from closed captions, because they make it easier to follow speech;

- understanding dialogue that is spoken very quickly, with accents, mumbling, or background noise;

- by including full names, brand names, or technical terminology;

- support concentration, which can provide a far better experience for viewers with learning disabilities, attention deficits, or autism;

- online videos with captions help student viewers "focus, retain information and overcome poor audio quality of the videos"[ii] where relevant.

- maintain quiet in shared, low-noise venues, such as libraries,

- viewers watching in noisy environments;

Types of DIY Captioning Programs:

If your organization wishes to provide video captioning but feels it can't afford the expense of outsourcing to a service, there are ways that you can type and synch captions with your video, such as:

Amara
http://amara.org/en

Amara is a free online captioning and subtitling service that allows users to upload and create captions for their videos, and is compatible with a number of different media players. There are also volunteer forums that can help with translating captions into other languages. For-cost captioning services are also offered. Amara requires creation of an account.

Chrome Transcribe
https://chrome.google.com/webstore/detail/transcribe-transcribe-aud/ogokenmicnjdfhmhocanoemnddmpcjjm

Chrome Transcribe provides a 7-day free trial before switching to a paid app. As a Chrome browser add on, it works offline, allowing a user to either type in or dictate and synch their own captions. This app can also provide initial drafts of transcripts for audio files that can then be edited for clarity and accuracy.

Dotsub
https://dotsub.com

Dotsub offers free registration of a basic, limited account which is limited to YouTube and Vimeo-hosted videos. Paid features include upload of your video, and they offer for-cost captioning and translation services. Users can also seek out volunteers who are willing to offer captioning of videos free of charge, though this will not guarantee accuracy or proper regional spelling.

Easy YouTube caption creator
http://accessify.com/tools-and-wizards/accessibility-tools/easy-youtube-caption-creator/

This online service is intended for easy creation of captions for YouTube video. The user only needs to paste the URL of a YouTube video, then type the transcript in for that video. It gives the option to space out the lines of text. The user may then watch the video, and adjust the newly formed captions for synchronization.

Inqscribe
https://www.inqscribe.com

Offering a 14-day trial, Inqscribe is a ~$100 app that allows a user to transcribe or caption a video, exporting various caption file formats compatible with online video sharing services such as YouTube.

YouTube
https://support.google.com/youtube/answer/2734705?hl=en

YouTube offers an internal caption editor within its Video Manager environment. One can either "Transcribe and auto-synch" which generally requires clean-up of the inaccurate automated speech recognition that is freely provided, or use the "Create new subtitles or CC" method. This latter approach allows one to transcribe spoken clips and synch them to create captions, which can also be downloaded by the YouTube account owner later, if desired.

Bear in mind, that while some of these tools are not free, it may be less expensive in the long run if there are many videos that require captioning. Considerable time is required to caption anything beyond a few minutes in length, and proofing by another person is vital to ensuring accuracy before captions (or transcripts) are made public.

It helps the person transcribing to use a good quality headset when listening to video, so that the captions are as close to verbatim as possible, and that they show on screen when speech and sounds occur. Any new speaker after a previous one should also be identified in brackets. For more captioning guidelines, visit the Described and Captioned Media Program's Captioning Key webpages, which provide ample examples of what to do and why – and what *not* to do.

If using software that allows the recording of descriptive audio tracks, which benefit those with vision loss, a good quality microphone in a relatively noiseless environment (away from computer cooling fans) will ensure clarity. Guidelines are also available on the Described and Captioned Media Program's Description Key webpages. Creation of appropriate description is complex – as it is a form of interpretation involving careful consideration and experience – and often is best left to a professional.

Providing an alternative text file
Alternative text files such as transcripts help those who cannot rely on either the audio or the visual elements of a video for information. This consideration provides text for all visuals and sounds, in a file format that is accessible across assistive technologies. It provides for those with sensory or cognitive disabilities to better access your information in their own time and way.

The text file that is in lieu of audio or video should itself be provided in an accessible format, or it defeats the purpose. Keep these file links in proximity to an embedded video player, making it obvious what that link is providing.

Providing an accessible document

Documents, whether Rich Text Format (RTF), Word, PowerPoint, or PDF, can be provided in accessible or inaccessible ways. Best practices for accessible documents include using or providing:

- 12pt or larger sans serif font[iii] (e.g. Arial, Tahoma, Verdana)

- descriptive text for static images provided *within* any accessible document.

- application built-in styles in logical sequence to format your document (e.g. H1 for main title, H2 for major section headings, etc.)

- an automatic table of contents if the application offers such a feature

- selection of text for hyperlinks that provides suitable context

- indentation and spacing options in the paragraph pane to create whitespace, not repeated spacebar entries

- starting of a new page by using a page break

- bulleted lists when order is irrelevant, and numbered lists otherwise

- page numbers

- a file format that can be converted easily by a recipient (e.g. Plain Text or Rich Text Files, and Word documents or PDFs properly marked up by someone or a service that knows how – or that has been properly converted from already accessible documents)

Different document authoring applications provide varying ways of ensuring accessibility, including description of images. Visit the Accessible Digital Document Project for more.

How blind users access video

People living with vision loss often rely on software called a "screen reader" to listen to a document or webpage's structure and content being read aloud by a synthetic voice. These users navigate by keyboard, rather than by mouse. They must use their keyboard to navigate to and control a media player. While they may not see a video, they will hear it. Video (or audio) that auto-starts is problematic. The user should determine – when they have direct access to the controls and awareness that there are audio/video files available – when it plays and how loud it should be.

Video description is another form of accessibility augmentation. Description adds a voice to the audio track that explains what can be seen but not generally heard. This includes any text that occurs within the video such as titling. The Described and Captioned Media Program also offers great resources on their [Description Key webpages](). However, proper description is difficult as it involves interpretation of semantic content, and can take many video projects to amass an adequate amount of experience.

Audio Content

Using good quality audio has a large impact on ease of understanding, as well as the common enjoyment of any media you post online. For those who cannot rely on audio to comprehend all the information provided, transcripts and other text based formats open up your media to a broader audience. Transcripts provide a way for readers to quickly skim content and take notes. They also make the words throughout the video available for search engines to leverage.

As with video, addition of sign language interpretation to audio will help make your media available to many of those who are Deaf.

Providing transcripts and alternative formats

The demand for transcripts or other text based formats of news, updates and talk shows is rising, along with the average age of the Canadian population. Many people will find transcripts vital, and they should be available for any newly developed content. There are many good reasons to support your content with transcripts, including:

- It allows audience members who cannot listen/watch your podcasts/videos to access your content

- It reinforces your audio and video files with clickable links in the transcript

- It makes your content much easier to search through by your patrons, as well as easier to find by potential audience members

- It makes for better indexing and search engine optimization. In other words, your links will be more likely to wind up closer to the top of a Google search if you have a transcript of the content.

- Some people like to read along while watching/listening, which reinforces the content and message you're trying to deliver.

- Some people would rather read than listen.

- Making transcripts available also allows users who are deaf, or deaf-blind, to access your content via refreshable Braille displays.

There are a couple of ways you can develop transcripts:

- **Do It Yourself:** If you have both good hearing and audio equipment, individuals and organizations can create their own transcriptions. While this may be the most cost-effective way of producing a transcript, it is also the most time consuming. A good rule of thumb to be aware of is the 1:3 ratio. For each hour of audio recording, it can take (at least, and often more than) three hours to transcribe it.[iv] Proofing by another person, which comes highly recommended, adds even more time to the process.

- **Using Speech to Text Technology:** There is a variety of free/non-proprietary programs, as well as paid-for software, that can assist in producing transcripts. While attaining full accuracy will be challenging, they can reduce the amount of time needed to create a text version of the audio content. Many of these programs offer editing features to correct the inevitable misinterpretations by the speech recognition software.

- **Professional Services:** The easiest and fastest way to procure a transcript may also be the costliest. Transcriber rates are based on credentials and experience, rounds of proofing, as well as the project's subject matter complexity and desired turnaround time.

In addition to captioning and transcription, web accessibility for those who identify as culturally Deaf can also be improved with the use of sign language. Most people who are Deaf understand written language, but many find sign language easier and faster to understand than text. Unfortunately, integration of sign language is relatively expensive compared to transcription and captioning provision, as it often requires a sign interpreter, possibly coach, videographer and editor amongst other crew members.

Speech to text technology

Speech recognition technology is a rapidly advancing sector of software development, and has seen great improvements in accuracy over the past few years. With the cost of captioning and professional transcription services deemed too expensive for some limited budgets, or too time consuming, organizations may choose to take advantage of this technology in providing text alternatives of audio/video.

Below is a list of well-reviewed, free online/downloadable speech recognition programs:

Speechnotes
https://speechnotes.co

Speechnotes is a free speech recognition program that works through Chrome online. It is very easy to use and does not require any download. Speechnotes works best with live speech generation, but can also be used to transcribe pre-recorded audio clips using a microphone to pick up the clip during playback.

Braina
http://braina-speech-recognition-software.en.softonic.com/

The basic version of this software is available for free download and recognizes 40 different languages. Works best with live speech generation, but can also be used to transcribe pre-recorded audio clips using a microphone to pick up the clip during playback.

[oTranscribe](http://otranscribe.com/)
http://otranscribe.com/

This open-source program operates completely online, with no programs to download. This program transcribes pre-recorded audio files quickly, and offers the text file to be exported in a variety of formats with timestamps to help the user easily find specific parts of the recording.

Websites

Creating accessible websites

While offering accessible content is an excellent idea, it is even more important to have such content posted on an accessible website. Think about it – what good is the content if users cannot find and access it?

By law, some websites must be accessible. In Ontario, for example, new and significantly refreshed public websites designed for a private or non-profit organization with 50+ employees, or if the website belongs to a public-sector organization, must be accessible.[v]

Ontario was the first province in Canada to require these measures. Beginning January 1, 2014 "new public websites, significantly refreshed websites and any web content posted after January 1, 2012 must meet Web Content Accessibility Guidelines (WCAG) 2.0 Level A", and by January 1, 2021 "all public websites and web content posted after January 1, 2012 must meet WCAG 2.0 Level AA other than criteria 1.2.4 (live captions) and 1.2.5 (pre-recorded audio descriptions)." [vi] [vii]

This is important news if you are planning on developing a website in Ontario (with other provinces considering their own regulations.) You must take accessibility into consideration, or fines may be issued.

When building a website, either as a representative of an organization or as a web developer hired for this purpose, you should not assume that all users will access your content using the same browser or operating system you are familiar with. Nor can you assume a traditional video monitor, audio speakers, keyboard or mouse will always be in use.

Website accessibility should consider the following conditions or situations:

- **Those with hearing loss:** Deafened or hard of hearing individuals cannot access audio content, so video needs to be captioned, and audio-only media needs be transcribed. People who identify as being part of the Deaf community may prefer sign language videos to support your content.

- **Those who experience vision loss:** Individuals who are blind tend to rely on either audible output (such as screen readers) or tactile output (a refreshable Braille device). Images on the web that do not have Alternative Text associated with them (frequently referred to as "Alt Text") will be largely meaningless to users of such assistive technologies. Individuals with low vision may use screen magnification software that allows them to zoom into all or a portion of the visual screen. Text that is *part* of an image is especially troubling for magnifiers, as it pixilates or loses clarity. Unless it is specific

branding, it's better to avoid images of text in your web content.

Many of us with less-than-perfect eyesight[viii] may enlarge the font on websites using standard web browser functions, such as **Ctrl +** in Windows-based browsers or **Command +** for Mac browsers. Those who live with a form of colour blindness may have difficulty navigating websites that are colour dependent. It's a good idea to use high contrast colour combinations, and to make sure the design does not rely on colour alone to communicate information. For example, keep links underlined, and provide borders for buttons.

- **Those who have a learning disability:** Individuals with learning disabilities may use audible output, or software that highlights words or phrases as they're read aloud using synthesized speech. Using plain language makes a web site easier to understand for everyone.

- **Those who live with a physical disability:** Individuals with physical challenges affecting the use of their hands (whether temporary or not) may be unable to use a mouse. They may rely on keyboard shortcuts or use assistive technologies such as speech recognition, head pointers, mouth sticks, or eye-gaze tracking systems.

- **Mobile device users:** Individuals who access the web using a mobile device (such as a smartphone or tablet) often experience accessibility barriers, as they're using a smaller screen (possibly outside with light glare) and may need to zoom in or increase the font size. They are also likely to be using a touch interface rather than a mouse. Consider that Apple's iPhone and iPad devices do not support Adobe Flash.

- **Limited bandwidth:** Individuals located in a rural region or who cannot afford access to high-speed Internet – even if it is now considered a right in Canada – may be constrained to slower Internet connections. These users benefit from pages that load quickly, so including optimized images that are compressed for web viewing with Alt text is a good practice. Providing the option to view a higher definition image, if the user desires and transcripts for video/audio content are also good practices.[ix]

While this seems like a tall order, websites can be designed with these needs in mind and careful planning.

- **Choose an appropriate Content Management System.** Choose a Content Management System (essentially the platform on which a website is housed and edited) that supports accessibility. Joomla, Drupal and WordPress are all good examples, but there are others available that also support accessibility

features. If you already have a website in place, but want to upgrade it to support accessibility features, there are ways of doing this (e.g. if your website is coded in HTML, W3C offers [Guidelines on accessible HTML coding](#)).

- **Use headings.** Organize your website using headings. This is important in allowing screen reader users to identify and navigate webpages. Maintain the correct order of headings (e.g: use <h1> for the primary title of the page, <h2> for the top header, <h3> for the next, etc.). "Nest" content portions in a logical sequence this way. Headings can go from <h3> back to <h2>, but not from <h2> to <h4>.[x] [W3C offers tutorials and examples of heading structures](#).

- **Use Alt text.** Make sure image tags on your website have the alternative text, or "Alt Text" attributes in an HTML image tag filled in, as screen readers and refreshable Braille displays cannot simply "read" images. If a screen reader encounters a picture with no such descriptive tag, it will just say "image" or something to that effect, and move on. For your images to be meaningful to those using screen readers, written descriptions for graphics must be included (these descriptions are called "Alt text" in HTML parlance). An added benefit of including Alt text with images is that it will benefit not only those who use screen readers and refreshable Braille displays, but search engines which are also "blind" in a practical sense[xi] – though automated image analysis may change that in future.

- **Use descriptive links.** If you include links to other webpages or sites, make sure to make them descriptive in a way that shows where they will take the user. For example, if you are directing users to a page named "About Us", do not say: "Click here to read about our company." Instead, use something like: "To learn more about our company, read About Us."[xii]

- **Use colours in webpage text carefully.** While some groups, such as people who experience a learning disability, may benefit from colour coding to help distinguish between different parts of the website and content, it should not be relied upon to make the website work (e.g. colour coding forms to indicate required fields). This can be a barrier for those who live with a form of colour blindness. You may use colour, but be sure to use other visual indicators, such as an asterisk for important aspects of the website – and indicate what the asterisk means. It can help to distinguish blocks of content from one another using visual separations such as whitespace, lines or borders. It's also important to ensure that the background of the website is in high contrast with the text.[xiii]

- **Make your website keyboard accessible**. Many users like to use keyboard shortcuts, and it is critical for those who live with a physical disability and cannot use a mouse or trackpad. It's important to code your website so that

people can navigate it using the "tab" and "arrow" keys, or using alternatives such as single-switch input, or a mouth stick. To achieve this, the tab order must match the visual order of the content, allowing keyboard-only users to navigate through the webpages and the entire site effectively. Focus indicators are the displays that show what a user is accessing via the keyboard. They need to be obvious.

Do not use elements that only activate when a user hovers over them with a mouse, as keyboard-only or screen reader users will not be able to activate them.[xiv]

- **Use jump lists.** If your website consists of many long pages with a lot of content (which is common for WordPress and other Blog websites) it is very helpful to break up the content at regular intervals with anchor links, also known as jump lists. These allow keyboard-only users to skip to relevant portions of the website without having to backtrack through previous content. For example, the linked text "Skip to main content" should be provided at the top of each page, as well as "Return to top of page" links at the bottom and at regular intervals throughout the page, so keyboard-only users won't have to tab through the page navigation to get back to the main content.

- **Separate presentation from structure by using Cascading Style Sheets (CSS).** Web content should make sense visually without any added styles. Styles should only change a web page's aesthetics, not make it make sense. CSS can enhance website accessibility. CSS adds visual styles to content. Good design can make content easier to see, read and understand.

- **Label forms.** Another feature that should be designed with accessibility in mind are fill-in or interactive forms. Screen readers and Braille displays may not be able to read what type of content each form field requires. If your website has a form, ensure that each field in your form has a descriptive label associated with it. For example, if the field prompts the user to enter their name, it should be labelled clearly as either "Full Name" or have two separate fields labelled as "First Name" and "Last Name." You can use the <label> tag or an ARIA property to associate the label with the field.

- **CAPTCHAs**. These are used to determine whether or not the user is human. They are typically used to prevent spambots from being able to exploit or post on websites. CAPTCHAs often consist of an image with numbers or letters. However, screen readers and Braille displays are unable to interpret the CAPTCHA images, so they are not recommended for validating forms. WebAim has a full list of accessible CAPTCHA alternatives at webaim.org/blog/spam_free_accessible_forms.

- Finally, ensure that all dynamic content is accessible:

  o Dynamic content includes features such as screen overlays, rotating banners, lightboxes, in-page updates, popups, and modal dialogs. When content updates dynamically, e.g. without the user refreshing the page manually, screen readers may not be able to detect these changes. Keyboard-only users may become trapped in page overlays, with no way to exit except by closing the internet browser. Additionally, magnification software users might be zoomed in on the wrong section of the page and miss important content.

  o Include ARIA roles and alerts. If possible, use ARIA (Accessible Rich Internet Applications) roles and landmarks to identify website elements to ensure accessibility. ARIA coding is a powerful tool that can communicate with a screen reader to help blind users navigate pages more easily. ARIA regions and labels identify sections in a page. This allows a blind user to quickly understand what's there. By using ARIA, screen reader users can more easily skip over portions of a webpage that are not of interest while keeping track of where they are.[xv]

  o Other dynamic content that should be configured for accessibility are video players. Ensure that they do not auto-play, and that the players can be used with a keyboard. Also, all videos must have options for closed captioning and audio should offer transcripts for those who live with hearing loss.

  o If your site contains a slideshow, include Alt text for each photo. Ensure that the slideshow can be navigated using the keyboard only, and that it's easy to pause the show.

If you experience difficulties integrating any of these accessibility features, it often pays off to reach out to an experienced professional web developer. A professional that has graduated from an accredited web design program and is familiar with web accessibility best practices can offer invaluable help in setting up these features. Additionally, the A11Y Project offers many resources and community help to help organizations develop accessible websites, to learn more about their resources visit the A11Y Project website.

Website Validators

Now that we've covered basic considerations on how to create an accessible website, it's important that these features be tested for various levels of accessibility throughout the site. Different testing tools such as the following can be applied:

WebAIM's WCAG 2.0 Checklist for HTML documents
http://webaim.org/standards/wcag/checklist

This checklist provides an overview of several accessibility measures, and recommendations for implementing HTML-related principles and techniques for websites conforming to WCAG 2.0 specification. The language used here has been simplified from the official WCAG 2.0 specification to make it easier to implement and verify web page accessibility.

W3C Markup Validation System
http://validator.w3.org

The Markup Validator is a free tool and service that validates markup. In other words, it checks the syntax of Web documents, written in formats such as (X)HTML. The Validator compares your HTML document to the defined syntax of HTML and reports any discrepancies; syntax errors can be problematic for assistive devices navigating your website, so it's a helpful tool in determining that the coding is running as it should be, and for routing out potential problems.

WAVE WebAIM Colour Contrast Checker
http://webaim.org/resources/contrastchecker

The WAVE Colour Contrast Checker can analyze colour contrast ratios for all page elements at once, by entering the web address into the URL field. Increasing font-to-background colour contrast is important for those who have low vision.

WebAIM's WAVE web accessibility evaluation tool
http://wave.webaim.org/

This online tool checks page accessibility, displaying a webpage with tags to show good and bad points.

W3C CSS Validation Service
https://jigsaw.w3.org/css-validator

The CSS Validation Service checks the validity of Cascading Style Sheets (CSS). CSS is a style sheet language used for describing the presentation of a document written in a markup language. CSS organizes content visually. Note that almost all modern websites include CSS.

ARIA Validator for Chrome
https://chrome.google.com/webstore/detail/aria-validator/oigghlanfjgnkcndchmnlnmaojahnjoc

This tool adds a button to your Chrome browser that you can click when you want to validate the ARIA implementation of an HTML page. It also checks for duplicate IDs in your HTML. It will open a new tab showing errors and warnings for each frame it

can read on the page. Click the link to the Chrome webstore above and search for ARIA Validator for Chrome to download the extension.

AChecker Web Accessibility Checker
http://achecker.ca/checker/index.php

This tool checks single HTML pages for conformance with W3C Accessibility Standards to ensure the content can be accessed by everyone – including those who use assistive devices and programs.

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Endnotes

[i] While including Sign Language interpretation and described video is an excellent accessibility measure, it is not always a legal requirement as this can be onerous for some organizations.

[ii] Oregon State University. "Closed captions, transcripts aid learning for almost all students" Viewed 11/04/2107. Retrieved: http://oregonstate.edu/ua/ncs/archives/2016/oct/closed-captions-transcripts-aid-learning-almost-all-students

[iii] For a good discussion of typographic legibility, visit https://www.fonts.com/content/learning/fontology/level-4/fine-typography/legibility

[iv] "Podcast Transcripts - How to get a transcription of your podcast" Podigee: Blog and News. Viewed: 09/08/2016. Retrieved: https://www.podigee.com/blog/podcast-transcripts-how-to-get-a-transcription-of-your-podcast

[v] Government of Ontario. "How to make websites accessible" Viewed: 09/08/2016. Retrieved: https://www.ontario.ca/page/how-make-websites-accessible

[vi] Ibid.

[vii] Captions for typical video (as opposed to live, streamed events) *must* be captioned. Video description to benefit those who can't see the visual content is not required by AODA due to associated cost/expertise required – though is still a good offering to consider if your organization has the means.

[viii] Visit the Statistics Canada website for a sense of the rapidly expanding Canadian older population. For example, the over-65 demographic is now greater than that of the our youth. Viewed: 12/04/2017. Retrieved http://www.statcan.gc.ca/daily-quotidien/150929/dq150929b-eng.htm

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