ITO LMS:

ACCESSIBILITY STANDARDS

WHY DO WEB CONTENT ACCESSIBILITY STANDARDS EXIST?

Web content accessibility standards are intended to create consistent, practical measures in web design and applications that make it possible for people with disabilities to use internet resources.

These measures may be seen as internet analogs of wheelchair ramps in public buildings, textured pavements and audible signals at crosswalks and other practices in the public environment – for example, fonts, font-sizes, colors and contrast – that people without disabilities may not be aware of.

The ability to use the internet can be especially important for many people with disabilities who can be productively employed in doing 'brain work' but are unable to hold jobs that require physical activity.

WHY MUST WE APPLY THEM?

The ITO LMS application is being built to serve Employment Ontario partner offices. Ontario provincial law requires that websites used by provincial government agencies meet its accessibility standards.

EMPLOYMENT ONTARIO

Ontario

Failure to implement accessibility standards in internet applications used by Employment Ontario partner organizations would jeopardize these organizations' relationships with the provincial government.

YOUTH SERVICES JEUNESSE

Our initial customer, ITO2.0 as an employment services branch of the Youth Services Bureau of Ottawa, will therefore not accept an application that does not fully implement the provincial government's accessibility standards.

HOW STANDARDS ARE DEFINED

The Ontario Government's accessibility standards are based on recommendations contained in the W3C consortium's Web Content Accessbility Guidelines (WCAG).

WCAG level A guidelines must have been applied by January 1, 2017. Level AA guidelilnes must be applied by January 1, 2021.

In this project, **we will apply WCAG level AA guidelines**. The additional burdens of the higher standard are not onerous, and it makes more sense to build to this standard now than to rebuild in three years.

The most significant, applicable content of WCAG guidelines will be placed in a document in our project wiki, with annotations pointing out how they bear on our project. This document should be our principal source in applying accessibilitiy standards. This presentation will indicate the key points and will reference the relevant guidelines.

THE RANGE OF DISABILITIES FOR WHICH WCAG GUIDELINES ARE INTENDED

Visual disabilities:

- The blind make use of assistive technologies (AT), in particular 'screen readers,' which convert text content to audible voice content. Screen readers require certain page design principles and rigorous application of rules of html syntax.
- People with visual impairment short of blindness require larger font sizes, higher levels of contrast between text and backgrounds and the ability to magnify text.
- People with color blindness need colors that convey significant information to be those that they are able readily to distinguish.

Hearing disabilities:

- The deaf require subtitles or transcripts of information presented in audible form.
- People with impaired hearing short of total deafness require minimized background noise in audible information and the ability to regulate sound volume.

Mobility disabilities:

- Physical injury or neurological problems may make it difficult for some people to use a computer mouse or a normal keyboard. Keyboard alternatives are required.

Cognitive disabilities:

- For example, some people may be unable to associate icons with meaning or to discern the significance of images. Text alternatives must be provided.

Neurological disabilities:

- For example, flickering images and other visual patterns may cause seizures in some people.

DIVISION OF RESPONSIBILITIES IN APPLYING ACCESSIBILITY GUIDELINES

We are creating a vehicle for content, not the content itself.

Our **customers** will be responsible for providing content that meets accessibility guidelines:

- subtitles or transcripts of audible information.
- text alternatives to images.
- text as images that can be magnified.

User agents (**browsers**) usually take care of the following:

- volume controls for sound;
- magnification of text.
- keyboard alternatives for mouse gestures.

We will be responsible for the following:

- Navigation and page design useable by screen readers, including:
  - unique ids for html elements;
  - strict adherence to W3C html standards;
  - logical arrangement of navigation structure.
- Color choices and contrast levels.
- Provision for customer-provided transcripts to be viewed as alternatives to videos.
- Text alternatives for icons, if any.
- Ensuring that any significant text presented in images can be magnified or has text alternatives (EO partner logos in page headings).
- Ensuring that keyboard alternatives to mouse gestures work.

SOFTWARE

PEER GROUP

KEY GUIDELINES APPLICABLE TO OUR PROJECT

Guideline 2.4: Navigable content

2.4.1 Bypass Blocks: A mechanism is available to bypass blocks of content that are repeated on multiple Web pages.**[Our navigation design takes care of this.]**

2.4.2 Page Titled: Web pages have titles that describe topic or purpose. The descriptive title of an HTML Web page is marked up with the <title> element so that it will be displayed in the title bar of the user agent.

2.4.3 Focus Order: If a Web page can be navigated sequentially and the navigation sequences affect meaning or operation, focusable components receive focus in an order that preserves meaning and operability.

- when users navigate sequentially through content, they encounter information in an order that is consistent with the meaning of the content and can be operated from the keyboard.
- On a web page that contains a tree of interactive controls, the user can use the up and down arrow keys to move from tree node to tree node. Pressing the right arrow key expands a node, then using the down arrow key moves into the newly expanded nodes.
- An HTML Web page is created with the left hand navigation occurring in the HTML after the main body content, and styled with CSS to appear on the left hand side of the page. This is done to allow focus to move to the main body content first without requiring tabIndex attributes or JavaScript.
- Link text that is as meaningful as possible will aid users who want to choose from this list of links.
- More than one way is available to locate a Web page within a set of Web pages except where the Web Page is the result of, or a step in, a process. **[Our one-click navigation design should be okay.]**
- Headings and labels describe topic or purpose.
- When text fields receive focus, a vertical bar is displayed in the field, indicating that the user can insert text, OR all of the text is highlighted, indicating that the user can type over the text. When a user interface control receives focus, a visible border is displayed around it.

[This is the most important guideline from the standpoint of page design and operation.]

KEY GUIDELINES APPLICABLE TO OUR PROJECT (CONTINUED)

Guideline 4.1: Maximize compatibility with current and future user agents, including assistive technologies.

- ensure that authors do not do things that would break AT (e.g., poorly formed markup) or circumvent AT (e.g., by using unconventional markup or code);
- expose information in the content in standard ways that assistive technologies can recognize and interact with. Since technologies change quickly, and AT developers have much trouble keeping up with rapidly changing technologies, it is **important that content follow conventions and be compatible with APIs so that AT can more easily work with new technologies as they evolve**.
- avoid deprecated features of W3C technologies;
- elements have complete start and end tags;
- elements are nested according to their specifications;
- elements do not contain duplicate attributes;
- any IDs are unique.
- For all user interface components (including but not limited to: form elements, links and components generated by scripts):
  - the **name and role can be programmatically determined**;
  - states, properties, and values that can be set by the user can be programmatically set;
  - notification of changes to these items is available to user agents, including assistive technologies.
- A particularly important state of a user interface control is whether or not it has **focus**. The focus state of a control can be programmatically determined, and **notifications about change of focus are sent to user agents and assistive technology**. Other examples of user interface control state are **whether or not a checkbox or radio button has been selected**, or **whether or not a collapsible tree or list node is expanded or collapsed.**

KEY GUIDELINES APPLICABLE TO OUR PROJECT (CONTINUED)

Guideline 1.3: Adaptable content

This is an important guideline for us as developers. 'Adaptable content' refers to content that is easy to use by screen readers and other assistive technologies.

- Content conveyed through page organization and structure should be determined programmatically (e.g., placed within divs or <p>s of tables with column headers) to as to be detectable by screen readers.
    - The order of reading content of a page element (html div) should not be affected by other page elements. That is, the text in a main page division should not be interrupted by the text of a sidebar.
    - **[Our existing page design (left navbar, central section, right column containing divs for notifications and messages) appears to meet this requirement. See 'Examples of success' for 1.3.2.]**
- Info presented by symbols, italicized characters or colors, etc. should also be identified by text (for example, a required input indicated by '*' or a label in red should have 'required' added).
- Table headers should be used at the top of columns in tables to permit screen readers to identify the nature of the content provided in the column.
- Make sure that labels for form inputs appear in source code **[Wicket page rendering seems to be okay in this, but we should make sure.]**
- Page elements should be identified in a manner not dependent on visual clues ('save info' button, not 'round button' or 'button to the right').
- We need to be sure that categories of events on our calendar are not identified only by color or symbols.

KEY GUIDELINES APPLICABLE TO OUR PROJECT (CONTINUED)

Guideline 1.4: Distinguishable content

Use of color: Info conveyed by means of color cues should also be conveyed otherwise, usually by text.

- Greying out inactive form elements is okay: screen readers can identify elements that cannot receive focus.
- Again, do not use color alone to identify 'required' inputs.

Choice of colors: Colors used should provide adequate contrast with background colors, particularly in the case of colors that may not be distinguishable by people who are color blind. **[Let's just not get fancy with page design: Keep it black and white unless we have thoroughly tested colors.]**

Color contrast: For level AA, color contrast between font color and background colors should be at least at level 4.5, or level 3.0 for large text. **[Use contrast checkers (e.g., https://webaim.org/resources/contrastchecker) to check levels.]**

Background audio: Avoid background audio. People using screen readers and the hearing impaired may find it difficult to understand the reader over the background.

Font size: Font in text in images should be at least the equivalent of 14pt. **[html text is rendered accurately when magnified by zoom features. Images may not be because they tend to pixelate. In general, we should avoid using text in images but use html/css instead.]**

KEY GUIDELINES APPLICABLE TO OUR PROJECT (CONTINUED)

Guideline 1.1: Provide text alternatives for non-text content

'The purpose of this guideline is to ensure that all non-text content is also available in text. "Text" refers to electronic text, not an image of text. Electronic text has the unique advantage that it is presentation neutral. That is, it can be rendered visually, auditorily, tactilely, or by any combination. As a result, information rendered in electronic text can be presented in whatever form best meets the needs of the user. It can also be easily enlarged, spoken aloud so that it is easier for people with reading disabilities to understand, or rendered in whatever tactile form best meets the needs of a user.' **[Electronic text refers to html or .pdf files that have been converted to be readable by screen readers. We need to make sure that .pdf's have been converted.]**

Transcripts/subtitles: Transcripts or subtitles should be provided for audio or video content and audio descriptions should be provided for images.

Controls, Input: If non-text content is a control or accepts user input, then it has a name that describes its purpose. **[Avoid using icons for controls.]**

Time-Based Media: If non-text content is time-based media, then text alternatives at least provide descriptive identification of the non-text content. [**Time-based media means audio or video.**]

Test: If non-text content is a test or exercise that would be invalid if presented in text, then text alternatives at least provide descriptive identification of the non-text content.

Decoration, Formatting, Invisible: If non-text content is pure decoration, is used only for visual formatting, or is not presented to users, then it is implemented in a way that it can be ignored by assistive technology. **[EO partner office logos would probably do into this category. We need to check on what is necessary to be ignored by AT.]**

KEY GUIDELINES APPLICABLE TO OUR PROJECT (CONTINUED)

Guideline 1.2: Provide alternatives for time-based media

Links to transcripts: Video- or audio-only content should provide links to transcripts.

Captions: Alternatively, video content can include explanatory captions or subtitles.

[Much of the rest of this guideline refers to synchronous media, which is to say, real-time video or audio materials or, in a course, real-time interaction between teacher and students. We are not intending to use synchronized media at this time but need to keep this in mind if it is used in future enhancements.

Video materials to be provided by ITO 2.0, as presently conceived, will consist of slide shows with voice-overs reading the same info. Neither transcripts nor subtitles will be required for this. There may be supplementary videos of oral presentations providing context and personal experiences related to slide materials. Links to transcripts will have to be provided for these video segments.

We will thus need transcript links for some video segments but not for others.]

KEY GUIDELINES APPLICABLE TO OUR PROJECT (CONTINUED)

Guideline 2.1: Make all functionality available from a keyboard.

[Browsers today permit keyboard alternatives to mouse gestures. This guideline seems to have been created to refer to cell phones without browsers and does not appear relevant to the application we are developing.]

2.1.2 No Keyboard Trap: If keyboard focus can be moved to a component of the page using a keyboard interface, then focus can be moved away from that component using only a keyboard interface, and, if it requires more than unmodified arrow or tab keys or other standard exit methods, the user is advised of the method for moving focus away. **[We should test this, but it does not appear likely to be problem for us. We might want to check the calendar in particular in that it appears to involve some complicated controls.]**

Guideline 2.2: Provide users enough time to read and use content

This applies to controls that give the user a limited amount of time to respond. We should avoid these.

Video content should remain visible if the pause button is clicked.

This guideline can also refer to time-out features. **[This criterion would be met if, before a user is timed out, we generate a dialog that asks if user needs more time and giving him/her 20 seconds or so to respond by hitting any key.]**

KEY GUIDELINES APPLICABLE TO OUR PROJECT (CONTINUED)

Guideline 2.3: Don't design content in a way that is known to cause seizures

[We should avoid any kind of blinking content, which is what this guideline refers to.]

Guideline 3.1: Make text content readable and understandable.

- use clear and simple language;
- avoid centering text;
- avoid fully justified text (both sides);
- limit column width;
- avoid blocks of italicized text;

Guideline 3.2: Make Web pages appear and operate in predictable ways.

- Example: A dropdown menu on a page allows users to choose between jump destinations. If the person uses the keyboard to move down to a choice and activates it (with a spacebar or enter key) it will jump to a new page. However, if the person moves down to a choice and either hits the escape or the tab key to move out of the pulldown menu – it does not jump to a new screen as the focus shifts out of the dropdown menu.
- Components that have the same functionality within a set of Web pages are identified consistently.

Guideline 3.3: Help users avoid and correct mistakes. **[Proper validation takes care of most of this.]**

- point out errors;
- provide instructions and tool tips;
- suggest corrections of errors;

SUMMING UP KEY GUIDELINES

Much of compliance with accessibility standards is no more than common sense and good design.

Here are a few key take-aways:

- Maintain strict compliance with W3C html and css standards;
- Give every page a unique and meaningful title in the page head <title> tags.
- To comply with level AA, add 'role' to form element tab attributes and make the value of this 'role' a word or phrase that will help those using screen readers to navigate the page;
- Maintain adequate contrast between font and background: don't sacrifice readability to aesthetics;
- Make sure that navigation features and content appear in source code with humanly comprehensible ids/names/roles (click F12 and 'elements'), especially when content is being generated by Wicket iterators (ListViews, TreeTables);
- Make sure that focus and checks in checkboxes and radio buttons is visible to assistive technologies;
- Make sure that page content has a logically consistent flow;
- Use table headers at the top of table columns and give them ids, names and/or roles that clearly define column content;
- In time-out functions, give users an opportunity to extend the time;
- Provide validation functions that check for common errors, offer suggestions where appropriate;
- Provide links to transcripts wherever necessary (when audio info is not supplemented with substitles, captions or slide content).

Finally, make use of the W3C compliance checker (https://validator.w3.org/) to catch errors in html or css. This tool may also catch accessibility problems.