Accessibility in Microsoft Office & Webpages

Armita Zarnegar
DEPARTMENT OF COMPUTING SCHOOL OF SCIENCE, COMPUTING, AND ENGINEERING TECHNOLOGY

CONTENTS

SECTION 1- THEORY SUMMARY

Designing web pages that are accessible means making sure that people with disabilities can access and use your content. Some common disabilities are visual impairments, hearing impairments, people who use assistive technologies like screen readers, people with color vision deficiencies, and people who cannot use a mouse to navigate the page . Making your web pages accessible is an important step towards creating an inclusive online environment that can be used by all people, regardless of their abilities

Following are some key tips for creating accessible documents and web pages for visioin deficiencies and impairment, cognitive issues and reading disorders and those who need to use keyboards only.

Tips related to vision deficiencies and those using screen readers

1. Use descriptive text for images: Adding descriptive text, known as "alt text", to images allows visually impaired users to understand the content of the image. The alt text should be concise and accurately describe the image.
2. Ensure proper color contrast: Make sure the contrast between the text and background color is high enough to ensure readability, especially for those with color vision deficiencies.
3. Use headings to structure content: Use proper heading tags to create a hierarchical structure of content on the page. This allows users of screen readers to navigate through the page more easily.
4. Provide text alternatives for non-text content: Non-text content like videos and audio should have transcripts and captions available to make it accessible to people who cannot hear the content or do not have access to audio.
5. Make sure forms are accessible: Use labels for form elements, ensure that the form can be completed using only the keyboard, and provide clear and concise instructions
6. Use accessible media players: If your website has videos or audio, make sure the media player is accessible and can be controlled using only the keyboard
7. Provide a clear and consistent layout: A clear and consistent layout can help users navigate your website more easily, regardless of their abilities.
8. Setup a logical workflow for a web pages and forms so when screen readers go through it, the information makes sense
9. Use By following these tips, you can design web pages that are accessible to a wider audience, including people with disabilities

Additional design considerations that can be made to improve the accessibility of web pages for people with reading disorders and mental disabilities. The tipcs are extracted from Accessibility Handbook (Cunningham, 2012):

General tips related to Cognitive Disorders

1. Use clear and simple language: Avoid using technical jargon or complicated language that may be difficult to understand. Use plain language and keep sentences short and concise.
2. Use simple navigation: Use clear and consistent navigation throughout your website. This can help users with cognitive disabilities understand where they are on the website and how to find the information they need
3. Use visual aids: Incorporate visual aids like icons, images, and videos to help convey information. This can help people with reading disorders or other cognitive disabilities understand the content more easily
4. Use consistent formatting: Use consistent formatting throughout your website, including font size, color, and style. This can help people with cognitive disabilities understand the content more easily
5. Use captions and transcripts: Provide captions and transcripts for videos and audio content. This can help people with cognitive disabilities understand the content more easily

Dyslexia and other reading disorders related tips

1. Use sufficient line spacing: Use line spacing of at least 1.5 or 2 to improve readability for people with dyslexia
2. Use sufficient spacing between letters and words: Use spacing between letters and words to improve readability for people with dyslexia. A spacing of 1.5 to 2.5 times the default spacing can be helpful
3. Use sans-serif fonts: Use sans-serif fonts like Arial, Helvetica, or Verdana, which are easier to read for people with dyslexia
4. Avoid using all caps or italics: Avoid using all caps or italics, which can make text more difficult to read for people with dyslexia
5. Break up long paragraphs: Break up long paragraphs into shorter, more manageable sections to improve readability for people with dyslexia

Keyboard accessibility tips

Many accessibility users rely on the keyboard to navigate and operate the UI by. So it is important to provide clear and consistent keyboard navigation. The following tips can help you to implement keyboard accessibility:

1. Moving focus among elements by using the Tab key.
2. Ensure that all functionality is available via keyboard
3. Use meaningful focus indicators to show users where keyboard focus is. This can be done by changing the color or style of the focused element, or by adding a border or outline.
4. Navigating in container elements such as lists, grids, and tree views by using the arrow keys.

5. Invoking actions by pressing the Enter key or Spacebar.

This document is intended to give you a brief overview of accessibility tips and their implection in web pages and office tools. In the following sections I cover further details and provide practical instructions on how to implement and configure the recommendations.

SECTION 2- ADJUSTMENT FOR COLOUR AND VISION DEFFICIENCY

Avoid using color combinations that are low-contrast or difficult to read, such as light green and white or red and green. Additionally, refrain from using screens or tints in artwork, as well as screened or shaded backgrounds, watermarks, or other images placed behind text. Reduced contrast can impede readability and make it challenging for screen readers to interpret the text.

1. Use high contrast colors: High contrast between foreground and background colors can help individuals with color vision deficiencies differentiate between text and its background.
2. Use a simple color palette: Avoid using too many colors on your website. This can make it easier for users with color blindness to distinguish between colors.
3. Provide alternative text for images: People with vision difficulties might use a screen reader to navigate your website. Providing alternative text for images can help them understand what the image is about
4. Use scalable fonts: Font size can impact readability for those with visual impairments. Using scalable fonts that can be increased or decreased in size can make the website more accessible.
5. Avoid using color as the only means of conveying information: Some users may not be able to distinguish certain colors or may have difficulty seeing them. Using other cues, such as underlining or bolding, can help convey important information.
6. Use accessibility tools: There are several tools available, such as color contrast checkers, that can help ensure your website is accessible to those with vision difficulties.

By following these tips, you can help ensure your website is accessible to individuals with color and vision difficulties.

Many common accessibility issues on the web can be solved through good coding practice. The Web Content Accessibility Guidelines (WCAG) 2.0 documentation provides techniques and best practices to help you design more accessible dynamic web applications. For more information, please refere to (Microsoft Corporation, 2022).

SECTION 3- ADJUSTMENTS FOR DYSLEXIA AND COGNATIVE DISORDERS

People with dyslexia have a language-based neural difference. This can make reading difficult for them, because the task of connecting a speech sound to a letter or symbol is processed differently in their brains.

Millions of people have some form of language-based neural difference like dyslexia. The elements that make presentations clearer and easier to comprehend for people with dyslexia, also make them better in general.

Here are some tips for presentations to make them more inclusive for people with dyslexia. The elements that make presentations clearer and easier to comprehend for people with dyslexia also make them better in general. These tips help you do both.

Fonts

- Use simple, sans serif fonts with adequate spacing between letters. Use at least an 18-point font size. Good sans serif font examples include:
  - Calibri
  - Franklin Gothic Book
  - Lucida Sans
  - Segoe UI
- Avoid compressed, fancy, italic, or underlined fonts or fonts with uneven line weights.

Text

To keep your text easily readable, leave some space in your slides.

- Ideally, limit the number of lines on each slide to 7.
- Ideally, limit the number of words on each line to 6.
- Leave plenty of space above and below each line.

Speaker notes

- Instead of adding all the content on a slide, use speaker notes to provide more in-depth information. By default, speaker notes are formatted in a readable, sans serif font.
- Distribute your slides after your presentation, so your audience can refer to the slides and notes later to recall the verbal presentation delivery.

Layout and design

Thought-out slide design and layout can make your content more accessible to all audiences.

Background

- Bright white slide backgrounds can make text harder to read. Choose an off-white or cream background. Text should be dark, with lots of space around the letters. A dark background and white text also work.
- To set the background color, select **Design** > **Format Background** > **Color**. Then pick a color that suits your purposes.

Images

- Images are a great way to break up blocks of text and make your slide easier to scan. Add alt text to every image in your presentation.

Layout

- A colorful, high-contrast graphic layout, combined with pictures and text, creates a structured design. Structured layouts are easier for people with dyslexia to understand.

To make a PowerPoint presentation more accessible to people with disabilities, save it in an alternate format that can be read by a screen reader. Your audience can open it on a personal device or port it to a Braille reader.

SECTION 4- ADJUSTMENT FOR PEOPLE USING READING SOFTWARE

Screen readers are specialized applications dedicated to reading aloud text on a screen. They are mostly used by people with vision difficulties. Some of the most commo ones are Microsoft Narrator, JAWS, VoiceOver. They read text visible on the page, tags, headers and links. They can not read text in images so you need to enter alternative text for images to tell the reader what is the image about.

Since screen readers will read from the top of the page to the bottom, it's important that your document have a logical flow. For more information about screen readers please refer to the classic text book called accessibility handbook (Cunningham, 2012).

Create slides with proper reading order (PowerPoint Guide)

1. On the **Home** tab, select **New Slide**.
2. Select any pre-existing slide layout.
3. Add your slide content. Make sure that you don't delete or rearrange the default slide elements.

Group objects

If you have complex diagrams or illustrations made of many objects, group the objects into logical units. That way, the screen-reader user can read the grouped units rather than all of the individual objects in them. With grouped units, you'll only need to order the grouped units and not all of the objects in them.

1. Select **Review** > **Check Accessibility** > **Reading Order Pane**.
2. In the **Reading Order** pane, to select multiple objects, press and hold Ctrl and then click each object you want to include in the group.
3. To group the selected objects, press Ctrl+G.
4. To add alt text to the group, double-click the group name, type a description for the group, and then press Enter.

Modify the reading order

If you need a custom slide or you've modified the pre-existing slide layout, you can change the object reading order to match the visual layout order. Objects are read from top to bottom order.

1. Select **Review** > **Check Accessibility** > **Reading Order Pane**.
2. In the **Reading Order** pane, to change the reading order, rearrange the objects in the list. Do one of the following:
    - Drag an object to a new location.
    - Select an object and then select (Move Up) or (Move Down).

    Tip: If an object is not important for understanding the meaning of the slide, unselect the item checkbox to exclude it.

3. To double-check the order, read the objects in the **Reading Order** pane from top to bottom.

To learn more about screen readers and how things work in details, you can read this reference (Google Developers, 203).

SECTION 5- CREATE AN ACCESSIBLE WORD VERSION OF PRESENTATION

To make your presentation handouts more informative to the screen reader users, add the slide titles as headings and alternative text to each slide image.

1. In your PowerPoint presentation, select **File** > **Export** > **Create Handouts** > **Create Handouts**.

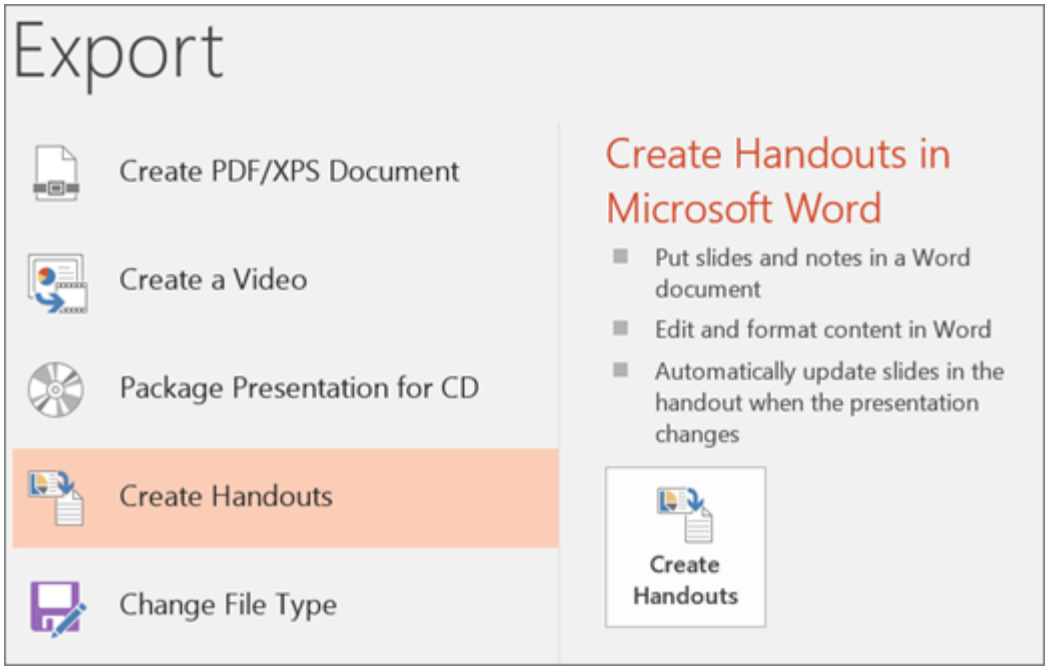

Figure 1- Create Handouts from a presentation

2. To display the presentation slides first, followed by the presentation notes, select **Notes below slides.**
3. To include the slide images in the Word document, select **Paste**.
4. To create the Word document, select **OK**.

Add slide headings

People who use screen readers use headings to navigate the document.

1. In the Word version, add a colon after each slide number, and then copy and paste the appropriate title from the PowerPoint presentation.
2. Select the slide title, and then select **Home** > **Heading 1**.

Add alternative text to slide images

The slides are embedded as images to the Word version of your presentation. As the screen readers don't read the text in the images, you need to add alternative text repeating the slide text and describing the slide content.

1. Right-click the slide image, and then select **Picture** > **Alt Text**.
2. Type the alt text that describes the slide content, not only the possible image on the slide. Also, repeat the slide text in the description.

Check the document for accessibility

1. Select **Review** > **Check Accessibility**.

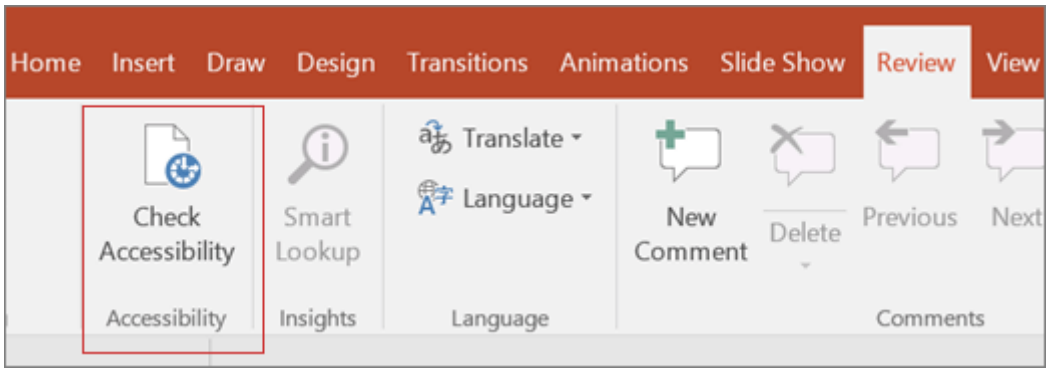

Figure 2- Microsoft Accessiblity Check

SECTION 6- MICROSOFT ACCESSIBILITY CHECKER COMMON ERRORS

The Accessibility Checker is a Microsoft tool that reviews your content and flags accessibility issues. It also explains why each issue might be a potential problem for someone with a disability. If content in the file makes it very difficult or impossible for someone with a disability to use, the Accessibility Checker classifies it as an error. The table below shows the common issues and explanation of how has an impact on users with special needs.

Rule	Accessibility Checker verifies	Why fix this?	Applies to these applications
All non-text content has alternative text (**alt text**).	All objects have alt text and the alt text doesn't contain image names or file extensions.	Screen readers speak the alternative text to describe images and other non-text content that users can't see. Based on alt text, users can understand the purpose and meaning of the described content.	Excel, PowerPoint, Word, Outlook, OneNote, Visio

Rule	Accessibility Checker verifies	Why fix this?	Applies to these applications
Tables specify column header information.	Tables and/or blocks of cells have the header box selected or a header row indicated.	Users rely on the table headings to understand the content that is subsequently read by the screen reader. Also, assistive technology often uses the table header row to help convey to the user the current cursor location in the table and to provide information that enables the user to navigate the table.	Excel, PowerPoint, Word, Outlook, OneNote
All sections have meaningful names.	All sections have names that aren't default or placeholder names such as "Default Section," "Untitled Section," or "Section 3."	Section names enable users to navigate more easily within a large presentation in the **Thumbnail Pane**, **Slide Sorter View**, and **Grid View**.	PowerPoint
All slides have titles.	Slides have titles.	Slide titles enable users to navigate within a presentation, including finding and selecting a single slide to immediately go to.	PowerPoint
Cells in an Excel worksheet don't use red-only formatting for negative numbers.	Cells that are set to **Number** format and use only the red color for negative numbers (e.g. show 1000 in red instead of -1000).	Users who have difficulty distinguishing color won't be able to tell the difference between positive and negative values.	Excel

Rule	Accessibility Checker verifies	Why fix this?	Applies to these applications
Image or object is inline with the text.	Images or objects are positioned inline with the surrounding text.	If the image or object is not inline, it can be difficult for screen reader users to interact with the object. It can also be difficult to know where the object is relative to the text.	Word
Document access is not restricted.	Any document that has disabled the **Access content programmatically** option in the document permissions settings: **Review** > **Restrict Editing** > **Restrict permission...**. Select **Restrict permission to this document** > **More options**.	Information Rights Management (IRM) protection can prevent devices such as screen readers from having access to this document. For more info, go to Allow changes to parts of a protected document.	Excel, PowerPoint, Word

One extra tip, **screen readers, read all the Enters as it is a part of your text, it** is a good idea to get rid of all additional Enters in your documentation. To do that, click the icon ¶ to show all hidden marks and symbols and then delete those extra Enters.

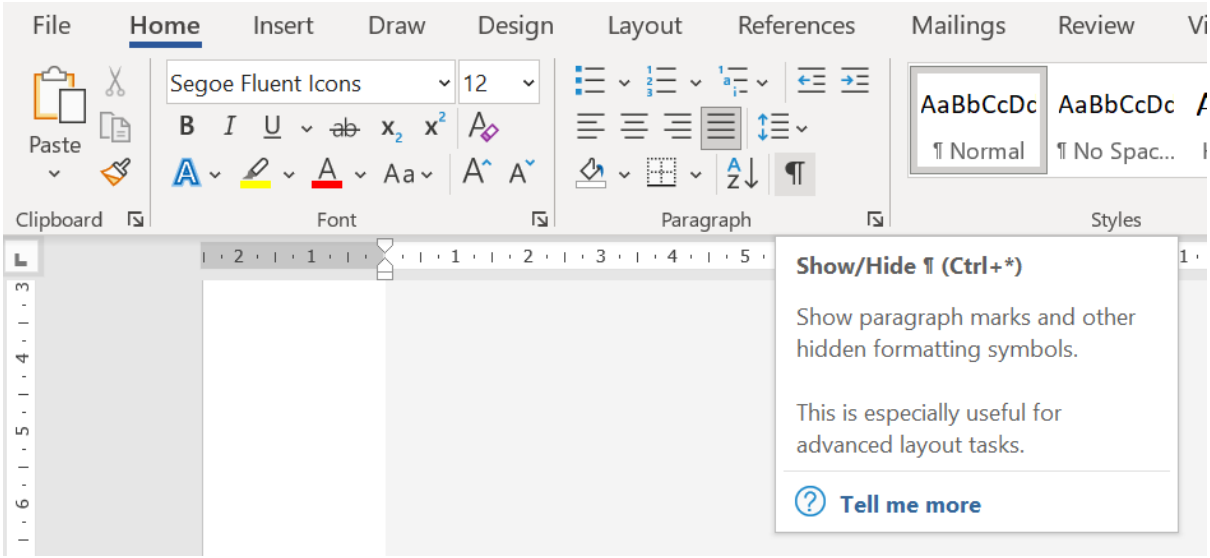

Figure 3- Displaying hidden symbols and marks

SECTION 7- ACCESSIBILITY CHECKER TOOLS

You can use accessibility tools to check the contrast between colors, see if all images have alternative texts. Microsoft has an accessibility checker that you can use for Microsoft office suite which we already reviewed. In addition the following tools are available to test your websites and web pages. Some of them give you additional information related to the performance of a website too.

1. WebAIM's WAVE tool: This is a free web accessibility evaluation tool that provides visual feedback about the accessibility of your web content. This is a web plugin.
2. Google Lighthouse: This is an open-source automated tool that checks web pages for accessibility, performance, and other best practices.
3. AChecker: This is a web accessibility evaluation tool that helps you identify accessibility errors in your web pages.
4. Axe by Deque: This is a browser extension that helps you identify accessibility issues in real-time while you are developing and testing your web pages
5. Web Accessibility Evaluation Tool (WebAim): This is a suite of web accessibility evaluation tools that helps you identify accessibility errors in your web pages.

The figure 1 below shows the report from Google Lighthouse extension. You can see that this extension gives information about performance of a website as well as its accessibility. WAVE is another web browser extension that is designed for accessibility check. Figure 2 shows the screenshots of running WAVE on a website.

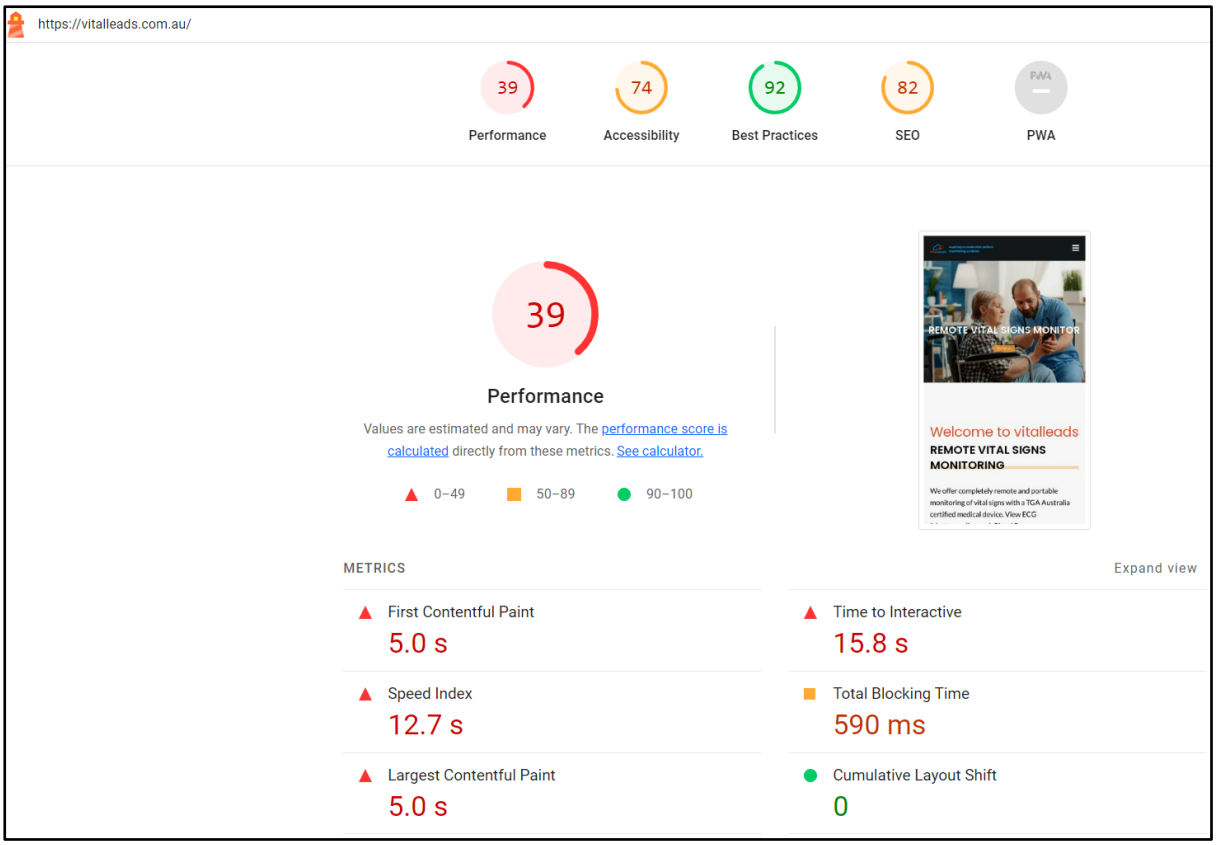

Figure 4 Example of Google Lighthouse extension output

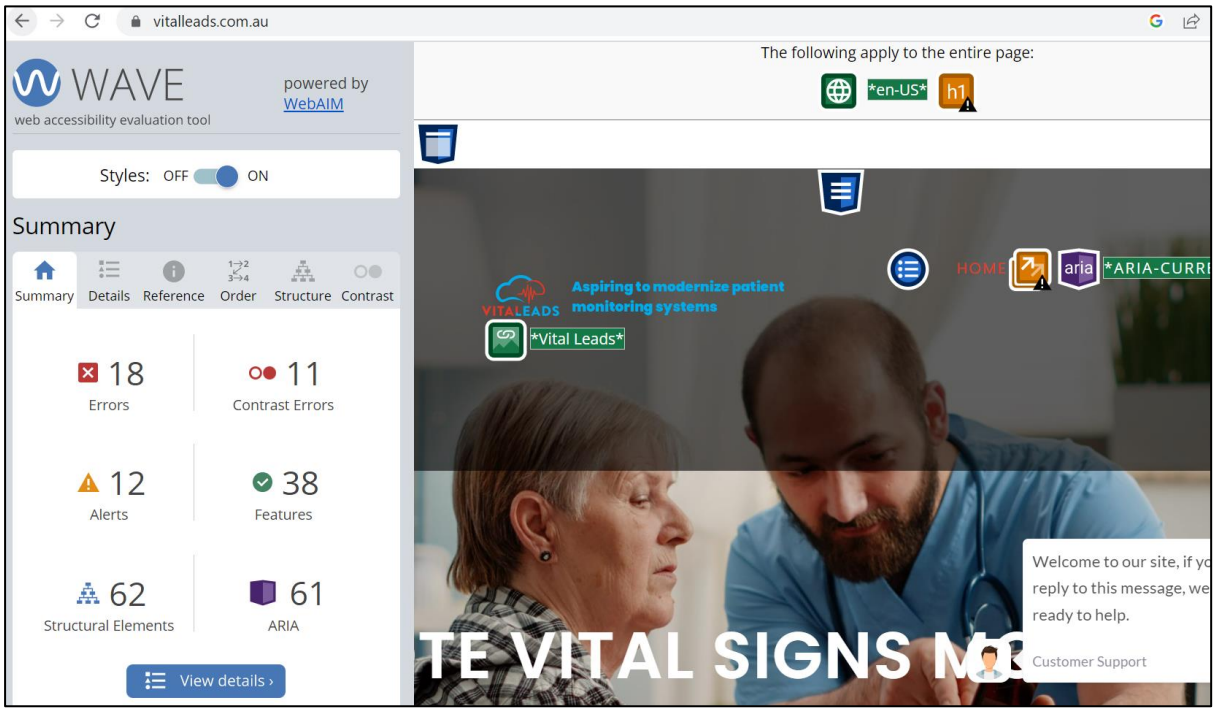

Figure 5 Example of the output of WAVE extension

SECTION 8- FURTHER RESOURCES AND READINGS

Here is the list of further resource related to accessibility:

1. Web Content Accessibility Guidelines (WCAG) - WCAG is a set of guidelines developed by the World Wide Web Consortium (W3C) to ensure that digital content is accessible to people with disabilities. The guidelines are organized into three levels of conformance (A, AA, and AAA) and cover a wide range of topics including text alternatives, keyboard accessibility, and color contrast (W3C Web Accessibility Initative , 2023).
2. Accessible Rich Internet Applications (ARIA) - ARIA is a set of attributes that can be added to HTML elements to make them more accessible to people with disabilities. ARIA is particularly useful for creating accessible dynamic content such as menus, sliders, and tab panels (WebAIM Institute for Disability Research, Policy, and Practice, 2023).
3. Inclusive Design - Inclusive design is a design methodology that aims to create products and services that are accessible and usable by everyone, including people with disabilities. The Inclusive Design Research Centre at OCAD University in Toronto has a range of resources on inclusive design, including research articles, case studies, and design tools. To find more about this you can refer to the following resource (Microsoft, 2018).
4. Accessibility Guidelines for Mobile Apps - This resource provides guidelines for designing mobile applications that are accessible to people with disabilities. The guidelines cover a range of topics including screen reader compatibility, touch targets, and text alternatives (International Association of Accessibility Professionals, 2023).
5. Universal Design - Universal design is an approach to design that aims to create products and environments that are usable by everyone, regardless of their age, ability, or other characteristics. This is not specifically about software products but it inclused everything including environment, buildings and products. The Center for Universal Design at North Carolina State University has a comprehensive list of resources on universal design, including articles, case studies, and design guidelines.To access the Australian Universal Design guideline, refer to (Department of Foreign Affairs and Trade, 2014)

There is a comprehenvisve reference book called Accessibility Handbook (Cunningham, 2012) if you are interested in further reading.

REFERENCES

Cunningham, K. (2012). *Accessibility Handbook: : Making 508 Compliant Websites .* O'Reilly Media.

Department of Foreign Affairs and Trade. (2014). *Accessibility Design Guide: Universal design principles of Australia's Aid Program.* Retrieved from Department of Foreign Affairs and Trade: https://www.dfat.gov.au/sites/default/files/accessibility-design-guide.pdf

Google Developers. (203). *Accessible to all.* Retrieved from web.dev: https://web.dev/accessible/

International Association of Accessibility Professionals. (2023). *Mobile Apps Accessibility Guidelines (2023)*. Retrieved from Accessibility Checker: https://www.accessibilitychecker.org/guides/mobile-apps-accessibility/

Microsoft. (2018). *Inclusive Design*. Retrieved from Microsoft.com: https://www.microsoft.com/design/inclusive/

Microsoft Corporation. (2022). *Designing accessible websites*. Retrieved from Micorosoft Learn: https://learn.microsoft.com/en-us/microsoft-edge/accessibility/build/

W3C Web Accessibility Initative . (2023). *WCAG 2 Overview*. Retrieved from W3CAG: https://www.w3.org/WAI/standards-guidelines/wcag/

WebAIM Institute for Disability Research, Policy, and Practice. (2023). *Introduction to ARIA - Accessible Rich Internet Applications*. Retrieved from webaim.org: https://webaim.org/techniques/aria/