WEB ACCESSIBILITY RESEARCH

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INTRODUCTION TO WEB DEVELOPMENT

CONTENTS

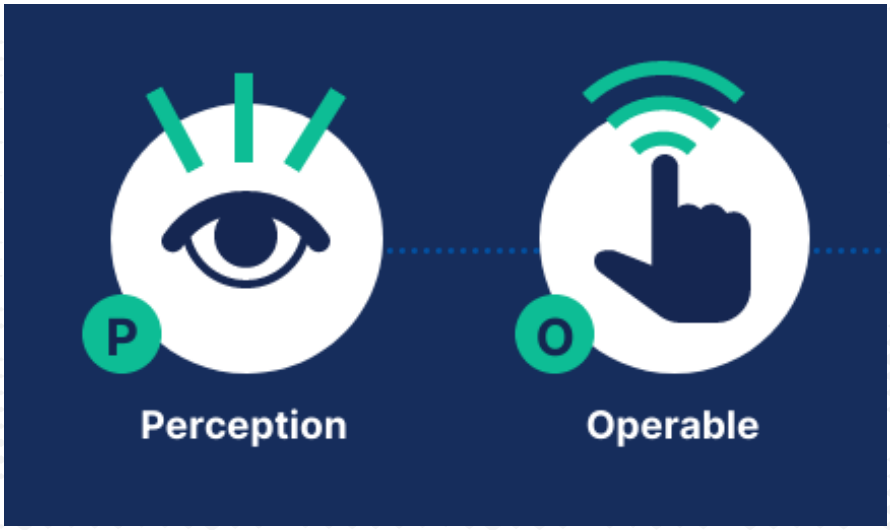
WHAT IS WEB ACCESSIBILITY?

Web accessibility is the practice of making websites usable by as many people as possible, including those with limitations or disabilities. Accessibility is often associated with users who have visual, auditory, motor, or cognitive impairments, however its benefits can be extended to other groups as well, such as people accessing content through mobile devices, those with slow network connections, and the elderly.

Ensuring web accessibility is not only a moral and ethical obligation, but also a legal requirement in various countries. It strengthens user experience and engagement, improves search engine optimization (SEO), whilst also creating a more inclusive digital environment. By designing with accessibility in mind, websites become easier to navigate and increasingly functional for all users.

WCAG PRINCIPLES

The Web Content Accessibility Guidelines (WCAG) provide a framework for making digital content accessible. These guidelines are built on four fundamental principles:



PERCEIVABLE

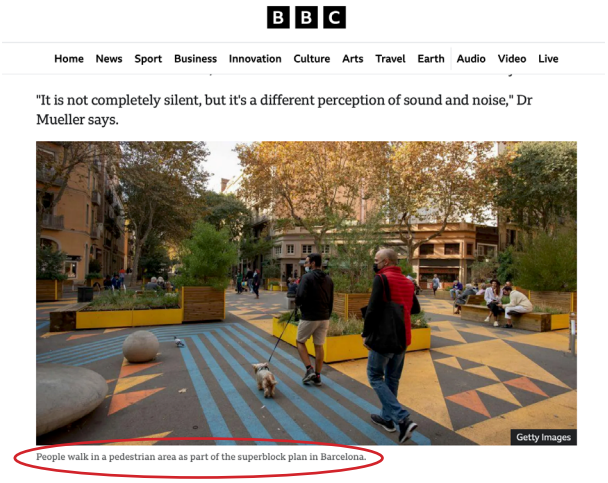
Information should be presented in ways that users can perceive through various senses.

- **Text-alternatives for non-text content**
  Images, buttons and other multimedia should have text equivalents (such as alt texts) for screen readers rather than having a vague label such as “magnifying lens” for search symbols. Charts and diagrams also require text descriptions to convey their meaning.

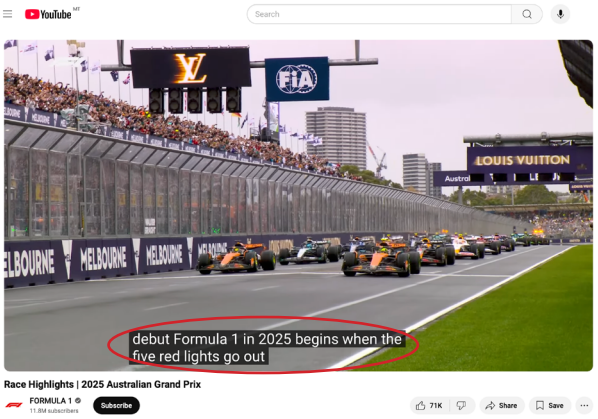
- **Captions and other alternatives for multimedia**
  Alternatives to multimedia that cannot be heard or seen include transcripts, closed captions for spoken parts, and audio descriptions of major elements that are visual in videos. Sign language interpretation further enhances the content’s accessibility for users who are hearing impaired.

- **Flexible presentation**
  Even though users modify text size, switch between color settings, or change layout, they should still be able to comprehend the content properly. Well structured headings and tables, as well as accurate labels on the input fields are building blocks for enabling assistive technology to convey the same content in any format.

- **Clarity of visual and auditory elements**
  Colour should not be the only means of communication, to accommodate those who are colour-blind. Text should remain clear and legible, even when sized up to 400%. Audio should have volume controls or a mute button for any background sounds.



The BBC News website includes descriptive alt text for all images, ensuring visually impaired users can better understand the context of photos and infographics.



YouTube offers auto-generated captions, with some content creators manually editing these for better accuracy.

OPERABLE

Users should be able to navigate and interact with a website using methods that work best for them.

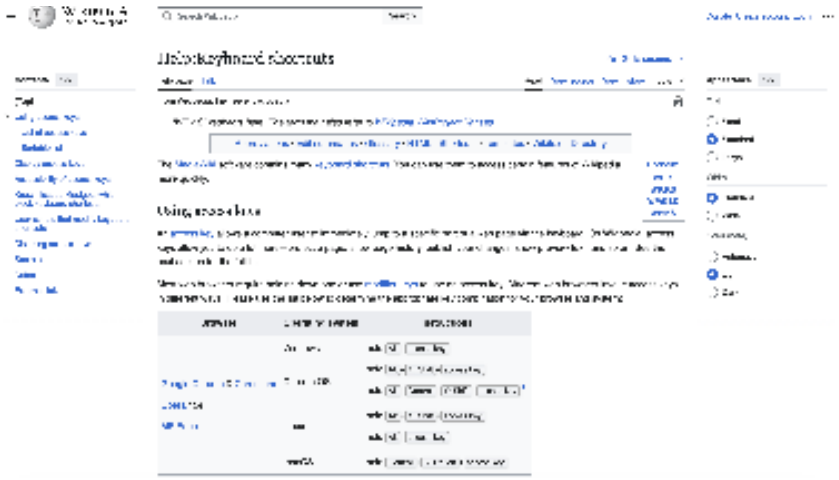
- **Keyboard accessibility**
  Some users navigate by use of a keyboard only. Each interactive component, including forms, buttons, and menus, must be accessible by keyboard, with clear focus indicators and no "keyboard traps".

- **Sufficient time to use content**
  Individuals who need to read or fill forms should be able to pause time limits or extend them. Content that is moving or scrolling should have controls available to pause or stop to help reduce distractions.

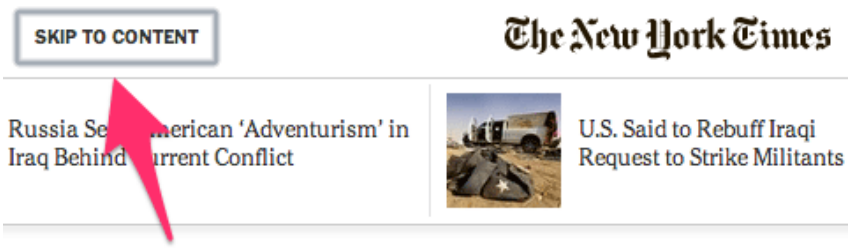
- **Avoiding seizures and other physical reactions**
  Flashing elements may induce seizures in those with photosensitivity. Websites should limit or remove flashing at high frequencies, or at least provide a warning and a safe alternative. Similarly, motion-triggered interactions should offer an option to disable these effects.

- **Easy navigation**
  Clear page titles, structured headings, and a uniform layout help users identify where they are in the site. Offering multiple navigation paths such as search bars, sitemaps, and breadcrumb links, supports different browsing preferences.

- **Multiple input methods**
  Websites should support different input facilities such as voice command, touch, and eye tracking. Target elements for touch should be big enough for touch-screen users; movement-based features must offer alternatives to avoid accidental activation.



Wikipedia allows full keyboard navigation, meaning users who cannot use a mouse can still browse effectively.



The "skip to content" feature on the New York Times website enables users relying on screen readers to bypass repetitive navigation links and jump straight to the main content of the article.

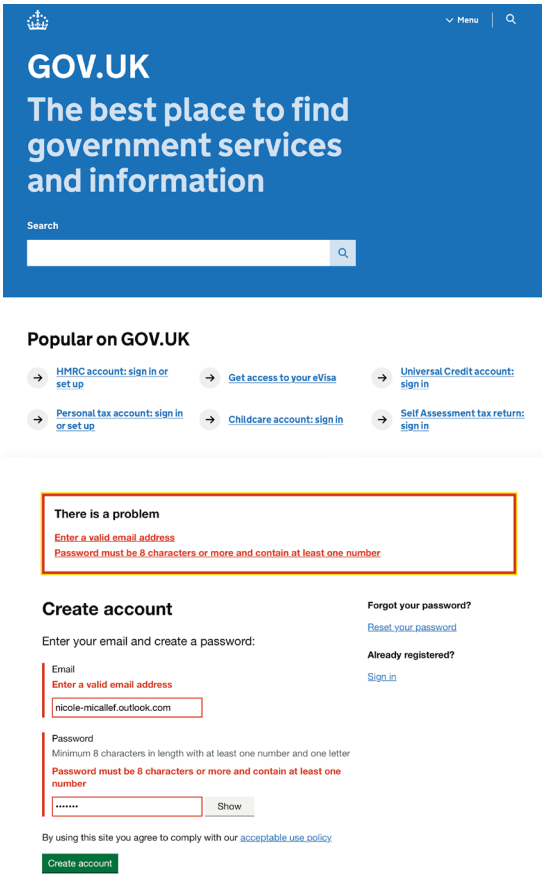
UNDERSTANDABLE

Websites should present information in a clear, predictable, and readable manner, reducing the chances of user confusion or errors.

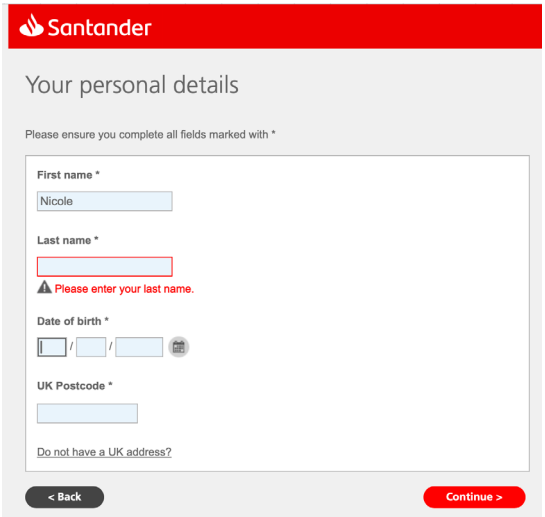
- Readable text
  Content should be concise, straightforward, and well-defined, meaning that technical or specialized terms require explanations. Web pages should indicate their primary language, and sections in other languages should be clearly defined and identified for users with screen readers.

- Predictable presentation
  The overall design should be consistent. Navigation menus, buttons, and any other interface elements should appear in consistent locations across pages. Unanticipated changes should only happen with the user's express consent; in other words, elements like automatic redirects should be avoided.

- Error prevention and correction
  Forms and fields should offer clear guidance and real-time validation. Error messages should describe the issue suggest options for resolution, when possible. For more complicated tasks, an undo option or an overview of actions may help users review details before submitting which in turn would contribute towards avoiding mistakes.



Government service portals, such as Gov.uk, use plain language and clear instructions to help users complete tasks efficiently.

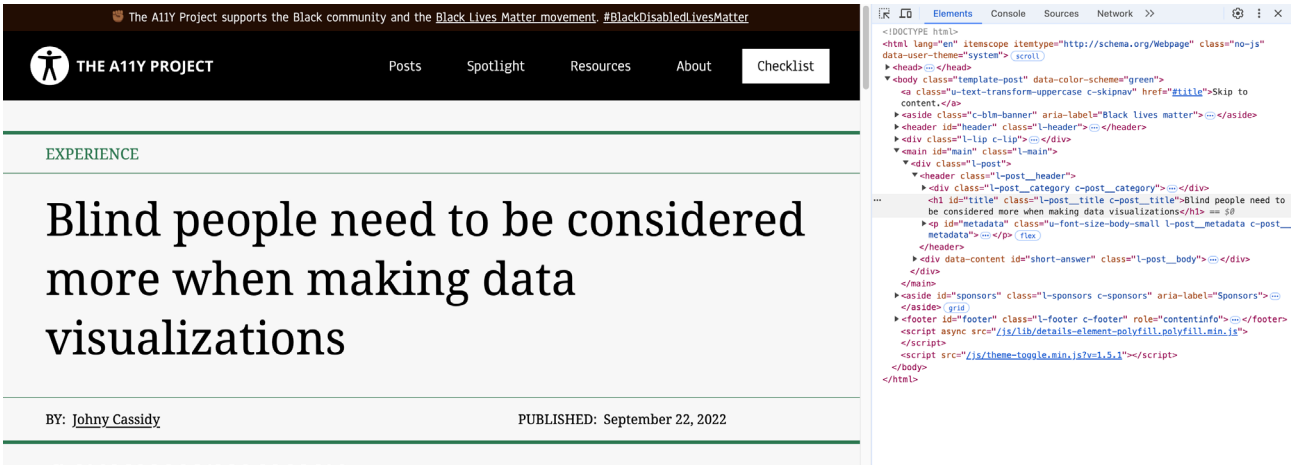


This form on the Santander registration page includes real-time validation, helping users correct errors (last name in this example) before submitting data.

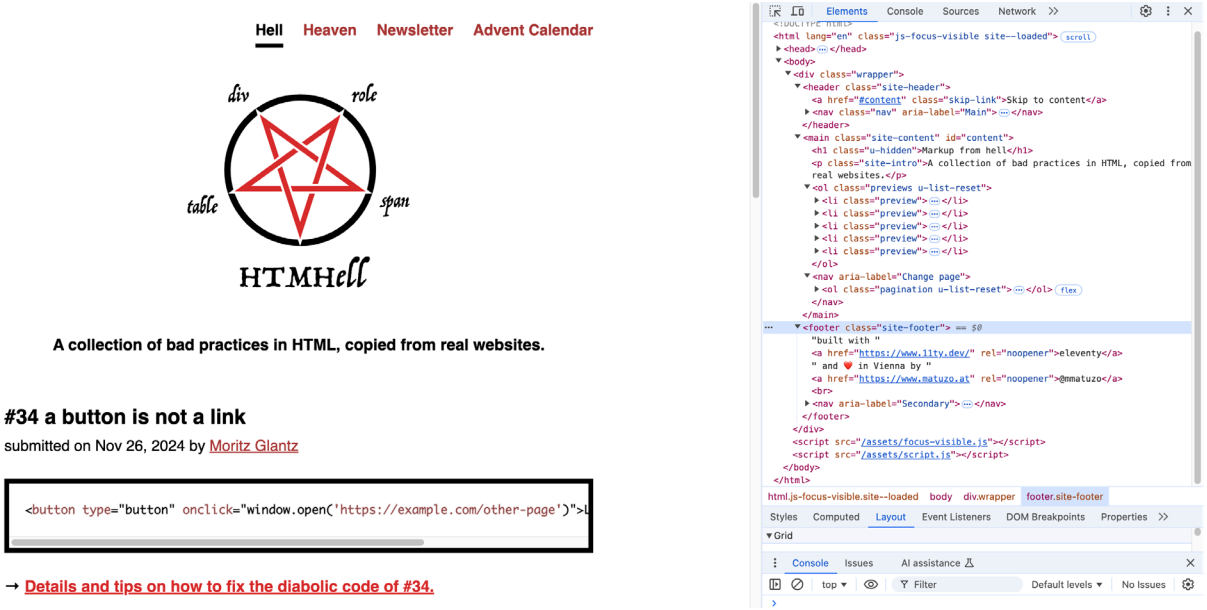
ROBUST

Ensure accessibility for content across a range of browsers and devices, including assistive technologies. Content must interface with various browsers, devices, and assistive technologies.

- **Compatibility with current and future tools**
  Websites should use well-structured, valid HTML allowing for the more precise interpretation by various browsers and assistive technologies. Custom interactive elements should have assigned roles, names, and values for their correct usage with screen readers and other assistive technologies.



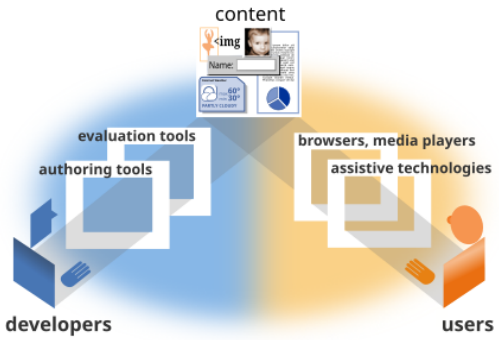
Websites that use semantic HTML elements, like proper heading structures and form labels, ensure that content is accessible across different browsers and devices.



OTHER WEB ACCESSIBILITY STANDARDS

Web accessibility depends on several essential components working together:

- **Web content**
  Text, images, multimedia, forms, and all interactive components.
- **User agents**
  Browsers, media players, and assistive tools, including screen readers, to access the content.
- **Authoring tools**
  Content management systems (CMS) and website builders should assist to generate accessible content.



In addition to the Web Content Accesibility Guidelines, W3C has formed many guidelines which when put together add to the web acccessibility. Understanding these guidelines enables a developer to guarantee interoperability through tools and platforms.

1. **W3C Web Accessibility Initiative (WAI)**
   WAI responsibilities range from making and maintaining several web accessibility guidelines, such as:
   - *Authoring Tool Accessibility Guidelines (ATAG)*: They ensure that content creation tools-such as content management systems-are both usable by individuals with disabilities and enable the production of accessible content.
   - *User Agent Accessibility Guidelines (UAAG)*: Focuses on making web browsers, media players, and other user agents more accessible to people with disabilities.

2. **WAI-ARIA (Accessible Rich Internet Applications)**
   Most websites nowadays have rather dynamic and interactive elements beyond the scope of simple HTML. WAI-ARIA is where attributes (roles, states, and properties) come into play, enhancing accessibility for many of today's complicated components like tab elements, sliders, and modal dialogs.
   Proper embedding of WAI-ARIA ensures the correct interpretation by assistive technologies such as screen readers and similar applications of all interactive features to the users.

EU REGULATIONS FOR PUBLIC SERVICES

The **Web Accessibility Directive** (**WAD**) was adopted on December 22, 2016, and aims to set standards for public services websites and mobile applications in the European Union.

Key Aims:

1. Increasing accessibility of public sector websites and applications to individuals with disabilities.
2. Harmonizing accessibility requirements among EU member states.
3. Reducing obstacles for developers who create accessibility solutions.

Core Requirements:

1. All content must comply with WCAG standards.
2. Public sector organizations must provide an accessibility statement detailing any remaining barriers and possible alternatives.
3. Clear feedback channel should exist for users to report accessibility issues.
4. Member states will observe and report on public sector website accessibility every three years.

IMPLEMENTING ACCESSIBILITY

Drawing on the above research, I aim to incorporate the following measures in my project:

- **Alt Text for Images:** Ensures screen readers can describe visual elements.
- **Keyboard-Friendly Navigation:** Allows users who cannot use a mouse to navigate effectively.
- **High-Contrast Color Schemes:** Assists those with color vision deficiencies.
- **Descriptive Form Labels and Error Messages:** Guides users more clearly when entering information.
- **Captioned Multimedia:** Supports individuals who are deaf or hard of hearing.

By incorporating these features, my project should align with WCAG guidelines, fostering a more inclusive user experience and meeting accessibility standards.

REFERENCE LIST

Deloitte. 2021. *Web accessibility standards and the importance of website compliance*. [Online]. [Accessed 16 March 2025]. Available from: https://www.deloitte.com/mt/en/services/consulting/perspectives/mt-web-accessibility-standards-and-compliance.html

European Commission. 2025. *Web accessibility*. [Online]. [Accessed 11 March 2025]. Available from: https://digital-strategy.ec.europa.eu/en/policies/web-accessibility

Mozilla Developer Network (MDN). n.d. *What is accessibility?*. [Online]. [Accessed 11 March 2025]. Available from: https://developer.mozilla.org/en-US/docs/Learn_web_development/Core/Accessibility/What_is_accessibility

Toronto Metropolitan University Pressbooks. 2019. *WCAG Principles*. [Online]. [Accessed 11 March 2025]. Available from: https://pressbooks.library.torontomu.ca/iwacc/chapter/wcag-principles/

Rana, A. 2024. *A Guide To The POUR Principles Of Accessibility*. [Online]. [Accessed 12 March 2025]. Available from: https://venngage.com/blog/pour-principles/

World Wide Web Consortium (W3C). 2024. *Accessibility Principles*. [Online]. [Accessed 11 March 2025]. Available from: https://www.w3.org/WAI/fundamentals/accessibility-principles/

World Wide Web Consortium (W3C). 2023. *Easy Checks – A First Review of Web Accessibility.* [Online]. [Accessed 12 March 2025]. Available from: https://www.w3.org/WAI/test-evaluate/preliminary/

World Wide Web Consortium (W3C). 2024. *Essential Components of Web Accessibility*. [Online]. [Accessed 11 March 2025]. Available from: https://www.w3.org/WAI/fundamentals/components/

World Wide Web Consortium (W3C). 2024. *Introduction to Web Accessibility*. [Online]. [Accessed 11 March 2025]. Available from: https://www.w3.org/WAI/fundamentals/accessibility-intro/

World Wide Web Consortium (W3C). 2024. *Web Content Accessibility Guidelines (WCAG) 2.1*. [Online]. [Accessed 16 March 2025]. Available from: https://www.w3.org/TR/WCAG21/