



In today's digital landscape, academic libraries must ensure their web content is accessible to everyone, including individuals with disabilities. Legislation such as the Accessibility for Ontarians with Disabilities Act (AODA) has made web accessibility a legal requirement in Ontario, CA.

Why is this important?

While providing an inclusive online experience, it guarantees equitable access to digital academic resources and online library services for individuals, irrespective of their disability status.

How do we achieve this?

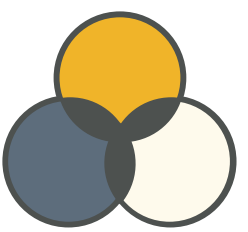
- There are two key approaches to accessibility audits:
- Manual testing
  - Automated testing

Manual Testing

Basic manual testing

It's a simple yet crucial method for understanding the user experience and guaranteeing minimal adherence to accessibility standards, such as those established by the W3C Web Content Accessibility Guidelines (WCAG).

This **testing typically includes** several checks including but not limited to:



**Color contrast:** Verifying that text, background, and interactive elements have strong color contrast. We ensure a 4.5:1 color contrast ratio between foreground and background elements.



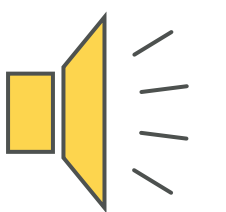
**Text size:** Assuring that text is readable at various sizes. We provide ways for users to enlarge text up to 200%.



**Alternative text for images:** Checking that all images have alternative text to convey their meaning in the context.



**Forms and input fields:** Ensuring that forms are accessible, with properly labeled input fields and clear instructions.



**Multimedia content:** Confirming that videos and audio content have captions, transcripts, or audio descriptions as needed.



**Consistent layout and navigation:** Establishing that the website layout and navigation are consistent and predictable.



**Keyboard navigation:** Ensuring all interactive elements can be accessed and operated using a keyboard alone, without requiring a mouse for motor and visually impaired users.

Various keyboard navigation tests conducted at the University of Waterloo Library

Checking the tabbing order

Maintaining the **logical order** of a web page's components is essential, as it impacts both the visual presentation and the overall usability. By using the keyboard, we check that the tab order on the library website offers a logical and intuitive flow, typically from top to bottom and left to right.

How?

- Use the **Tab key** to navigate forward through interactive elements such as links, buttons, form fields, and any other focusable elements.
- Use the combination **Shift + Tab key** to navigate backwards through the focusable elements of the interface.

Checking the tabbing focus visibility

A clear visual indication of the selected elements enables users to navigate and interact with the web page structure interface, providing a better experience for all users. **For example**, to help users learn more about Omni, the Library's catalogue, we ensured they could tab to the in-text link on the library website, and an outline would appear around it.

How?

- By pressing the **Tab key** on the keyboard, ensure that each element is visibly highlighted when it receives focus.
- Look for clear indicators like **outlines**, background **color changes**, or **border changes**.

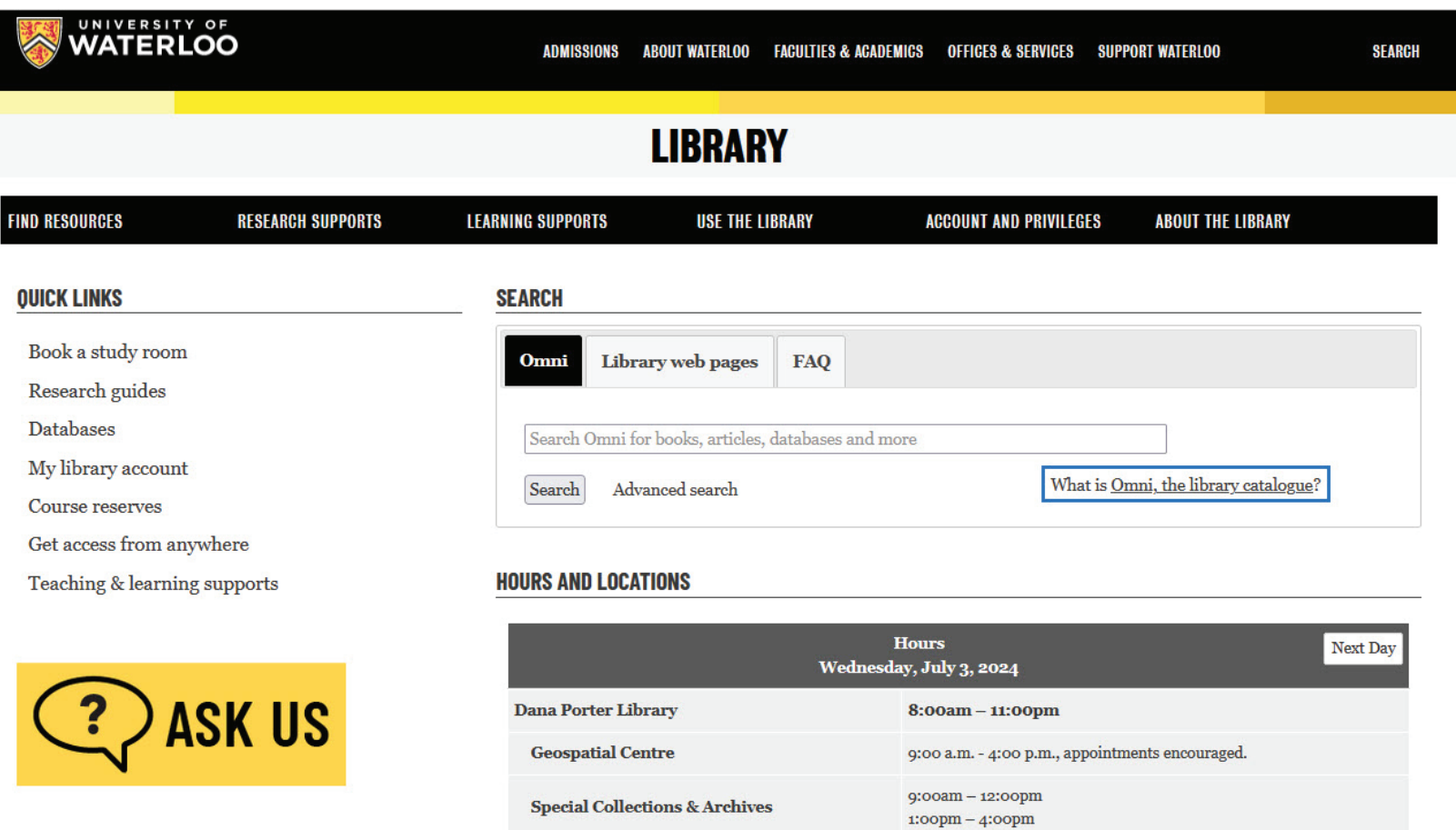
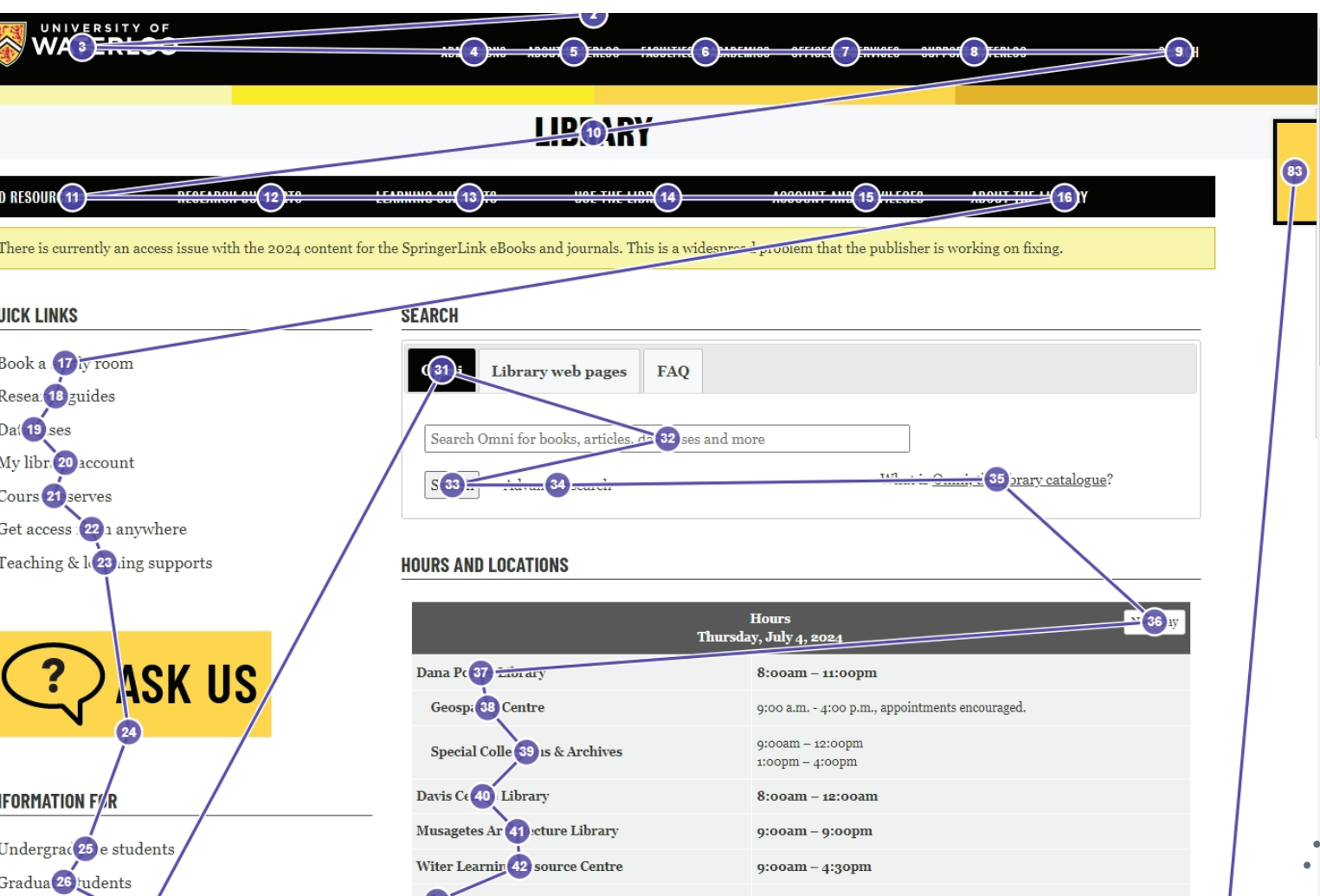
Assessing interactive elements

Interactive elements on a web page are **components that users interact with to perform actions, navigate, or input information**. They are crucial for creating an accessible, engaging, and functional user experience.

**Common interactive elements** are buttons, links, forms, drop-down menus, sliders, modals & pop-ups, tabs, media players, search bars, interactive graphics, games & quizzes.

How?

- Use the **keyboard keys** (e.g., tab, enter, arrows, spacebar, escape) navigate through interactive elements to activate them and ensure they function as expected.
- Test all **form inputs** (text fields, checkboxes, radio buttons, dropdowns) by entering data and submitting the form.
- Test the **search form** to confirm you can enter a term and submit a search via the keyboard.



Testing setups performed at the Waterloo Library

| Element                | Checking keystrokes                                                                                                                                                                                                           |
|------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Link                   | › <b>Press the Enter key</b> > Does it activate the link?                                                                                                                                                                     |
| Button                 | › <b>Enter or Spacebar key</b> > Does it activate the button?                                                                                                                                                                 |
| Checkbox               | › <b>Spacebar key</b> > Does it check and uncheck a checkbox?                                                                                                                                                                 |
| Radio buttons          | › <b>Spacebar key</b> > Does it select the focused option?<br>› Are the navigational arrow keys <b>↑/↓</b> or <b>←/→</b> helpful to navigate between options?<br>› <b>Tab key</b> > Does it leave the group of radio buttons? |
| Select (dropdown) menu | › <b>Up and down arrow key ↑/↓</b> > Do they help navigate between options?<br>› <b>Spacebar key</b> > Does it expand the menu?<br>› <b>Enter/Esc key</b> > Does it select the option and collapse?                           |
| Tab panel              | › <b>Tab key</b> > Does it help to navigate into the group of tabs and out of the group?<br>› Are the navigational arrow keys <b>↑/↓</b> or <b>←/→</b> helpful to choose and activate previous/next tab?                      |

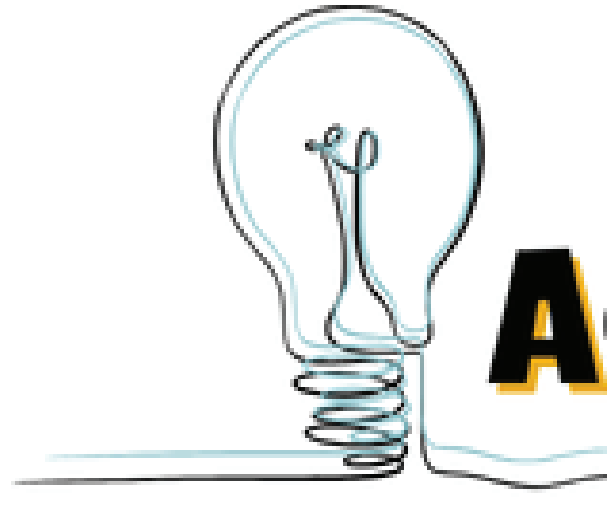
Advanced manual testing

This **testing characteristically involves the use of assistive technology** like screen readers to test if the website is navigable and comprehensible for visually impaired users. It helps ensure that all elements are accessible and provide meaningful information when navigated to and activated.



Depending on the **operational system** used, there are different **screen reader options** that can be installed or enabled on a device.

| Operational system | Screen reader(s)            |
|--------------------|-----------------------------|
| Windows            | <b>JAWS, NVDA, Narrator</b> |
| Macos / iOS        | <b>VoiceOver</b>            |
| Linux              | <b>ORCA</b>                 |



**Ask me now!**

For a demo of how to use VoiceOver on iPhone!

Automated Testing

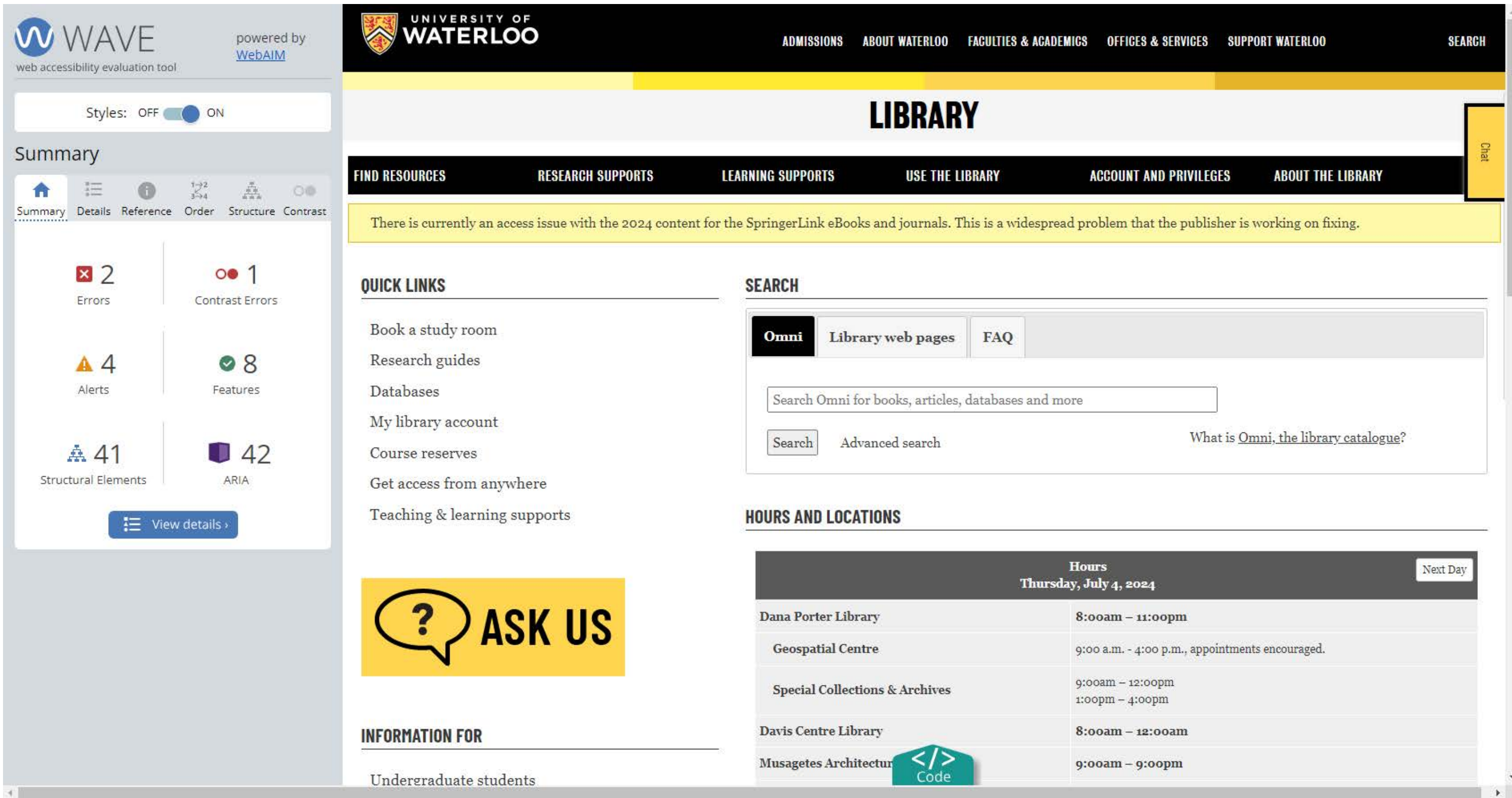


Automated tools such as **browser plugins** often complement manual testing. They augment testing by identifying new issues and validating those already found during manual testing. Depending on the browsers, you can employ tools like WAVE or Silktide to check interactive elements.

Plugins and browsers

| Plugin                         | Chrome | Edge | Firefox |
|--------------------------------|--------|------|---------|
| WAVE                           | ✓      | ✓    | ✓       |
| Accessibility Insights for Web | ✓      | ✓    | N/A     |
| Silktide                       | ✓      | ✓    | N/A     |

Example of the WAVE plugin assessing uWaterloo Library website homepage



Tips:

- Test the interactive elements across different browsers (Chrome, Firefox, Safari, Edge).
- Verify functionality on various devices including desktops, laptops, tablets, and smartphones.

Being accountable

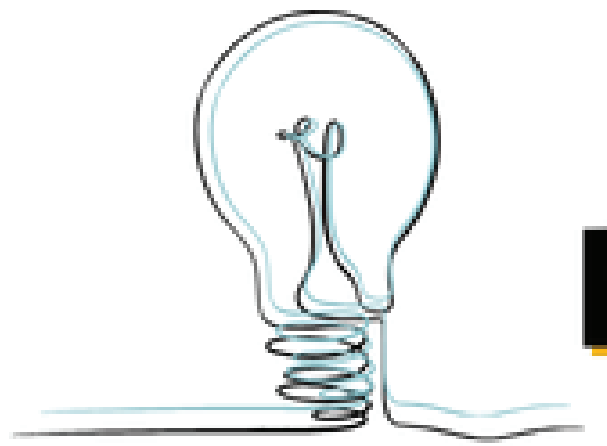
Record the issues encountered during the web accessibility audit process in detail. This will assist in the reporting process after the audit, consolidating the remediating actions, whether done by you or through third parties.

**For example**, web accessibility issues are reported to and by the **Digital Initiative** department at the University of Waterloo Library via email and we add them to a comprehensive spreadsheet (optional). Staff are encouraged to include as many details as possible, like:



- Impact level:** High, Medium, Low? Is the issue a roadblock or just frustrating?
- URL/Page/Section/Interface:** Provide the URL and the element on the page.
- Issue description:** A description of the issue and details about the expected behavior.
- Testing method:** How was the issue found? Was it using keyboard only? On a laptop? Which browser?
- Visuals:** Screenshots are extremely useful to show what and where the issue is occurring.

Regardless the approach, web accessibility testing is crucial for providing a user-centered evaluation of accessibility. Therefore, conducting a comprehensive web accessibility audit not only meets legal requirements but fosters an inclusive online environment and enhances the user experience for everyone.



**For more contact:**

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Credits

- Israel Cefrin ..... Information Technology Specialist/Developer, Digital Initiatives
- Stefaniada Voichita ..... Library Associate, Instructional Design
- Mayuri Sivakumaran ..... Instructional Graphic Design Co-Op Student

Resources



- W3C Web Content Accessibility Guidelines (WCAG) Overview: <https://www.w3.org/WAI/standards-guidelines/wcag/>
- Usability.gov - Accessibility: [usability.gov](https://www.usability.gov/)
- W3C Introduction to Web Accessibility: <https://www.w3.org/WAI/fundamentals/accessibility-intro/>
- WebAIM - Keyboard Accessibility: <https://webaim.org/techniques/keyboard/>
- WAVE Web Accessibility Evaluation Tool: <https://wave.webaim.org/extension/>
- Silktide Accessibility: <https://silktide.com/toolbar/>
- HeadingMaps Tool: <https://headingmaps.com/>
- Accessibility Insights: <https://accessibilityinsights.io/>
- JAWS Screen Reader: <https://www.freedomscientific.com/products/software/jaws/>
- NVDA Screen Reader: <https://www.nvaccess.org/>
- VoiceOver - Apple Support: <https://support.apple.com/voiceover>
- ORCA Screen Reader: <https://help.gnome.org/users/orca/stable/introduction.html.en>
- W3C - Conformance Evaluation and Reports: <https://www.w3.org/WAI/test-evaluate/conformance/>