

INFORMATION ACCESS FOR EVERYONE: WEB ACCESSIBILITY IN THE LIBRARY

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The first principle of the American Library Association's Code of Ethics reads as follows:

"We provide the highest level of service to all library users through appropriate and usefully organized resources; equitable service policies; equitable access; and accurate, unbiased, and courteous responses to all requests."¹

Written into the bedrock of our profession is a commitment to access and a commitment to service. One area in which service and access are neglected is digital and online content. A study conducted by WebAIM, a non-profit based out of Utah State University, finds that among the 1,000,000 most popular homepages on the Internet, the average page has 56.8 errors.² To fulfill our institutional mission, libraries must make an effort to improve our digital accessibility.

Web accessibility can be intimidating – and perhaps for good reason, as it is a complicated topic. It is critical to our profession that we strive to maximize access to information. This article aims to provide an overview of the legal requirements, content standards, and overall workflow of how organizations can build accessibility into their digital content. It is not comprehensive, but it provides resources for all library technologists to learn more on their own and begin making their resources available to as wide an audience as possible.

Web Accessibility and Universal Design

Web accessibility refers to the practice of ensuring that Web sites, tools, and

technologies are designed and developed in ways that allow people with disabilities to use them effectively. Web accessibility is crucial because it ensures that everyone, regardless of their physical or cognitive abilities, can access information and services available online. It benefits not only people with disabilities, but also those using different devices (such as mobile phones), facing temporary limitations (like a broken arm), or dealing with situational constraints (such as bright sunlight).

One way to think about accessibility is the concept of "Universal Design," which disability advocates have used since the 1970s. As outlined by the designer Roberta Null, Universal Design consists of the following four pillars:³

- The design is supportive
- The design is adaptable
- The design is accessible
- The design is safe

Universal Design means creating spaces (physical or virtual) which are usable by everyone, under a wide array of conditions and circumstances. A universally designed Web site allows someone to access it despite having a broken arm that prevents the use of a mouse, or someone who is blind being able to find information about your library's collection of audio books.

"Web accessibility means that people with disabilities can use the Web equally," according to the World Wide Web Consortium (or W3C). An oft-repeated slogan of theirs is

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“Web accessibility: Essential for some, useful for all.”⁴ Although accessible design is geared towards people with disabilities, Universal Design principles ensure that everyone benefits in some way.

Consider also the proportion of people with disabilities: “An estimated 1.3 billion people – or 16% of the global population – experience a significant disability today,” according to the World Health Organization.⁵ And unlike other groups, as a common refrain goes amongst disability advocacy groups, disability is the only minority group in which any of us can suddenly find ourselves after an accident, disease, or simply through age. Universal Design is not just about equity of access; it is about future-proofing as well.

The Law and Standards

Beyond the ideological mission of libraries, however, lies another reason to care about digital accessibility – it is the law. While not all Florida libraries are covered by the same regulations, they are all bound by legislation to ensure their services are accessible to people with disabilities. Two particular laws may apply.

Americans with Disabilities Act

The Americans with Disabilities Act (ADA) was passed in 1990 and took effect in 1992. It was expanded in 2008. In addition to setting regulations for accommodations for access to spaces in the physical world, it also requires online spaces to be accessible by removing “Website Accessibility Barriers.”

Who is required to follow the ADA Requirements including Web accessibility?

- State and local governments (Title II)
- Businesses that are open to the public (Title III)

Title III does not just apply to private corporations but also to private universities and nonprofit organizations. Although recent rule changes to ADA have elaborated on the specific requirements for Title II organizations,

they are very clear also that Title III organizations are still bound by Web accessibility requirements.⁶ Title II organizations, which include state universities and public libraries, are now required to comply with Version 2.1 of the Web Content Accessibility Guidelines (WCAG) which we will discuss shortly.⁷

Section 508 of the Rehabilitation Act

For any organizations within the Federal government or organizations who contract with the Federal government and provide any form of Information or Communication Technology (ICT), Section 508 of the Rehabilitation Act also sets strict requirements for Web accessibility. Fortunately, these requirements are similar to those under the ADA – conformance to WCAG standards.⁸

Content Accessibility Guidelines

Web Content Accessibility Guidelines are intended to provide a technical standard for Web accessibility that can be used as a goal (or law) for organizations and governments. They are developed by the World Wide Web Consortium (W3C), the organization behind standards for HTML, CSS, APIs, and many others.⁹

Versions 2.0, 2.1, and 2.2

The current standard is WCAG version 2, or most specifically 2.2. It has four principles:

- Perceivable – content must be accessible through the user's senses.
- Operable – users must be able to physically use the interface.
- Understandable – content and functionality must be able to be easily understood.
- Robust – content must be flexible enough to be read by many devices.

Testable Success Criteria

In a practical, measurable sense, the WCAG defines three levels of success criteria: A, AA, and AAA. Level A is the lowest level of success criteria and not considered up to legal standards. Level AA standard is generally regarded as “minimum acceptable” criteria.

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Each level's Success Criterion tells how to meet them including:

- Sufficient techniques for meeting the Success Criterion
- Optional advisory techniques
- Descriptions of the intent of the Success Criteria, including benefits, with examples.

PDF/UA

Another conformance standard useful to know is PDF/UA (Universal Accessibility). This ISO standard mostly exists to provide validators, software developers, and those on the more technical side with guidelines for more accessible PDFs.¹⁰ From an accessibility specialist perspective, the main interactions with PDF/UA as a standard are through validation tools, the gold standard of which is the [PAC 2021](#) tool by the PDF/UA foundation.

VPAT and ACR

For library technologists, software procurement might be an important – if occasional – part of their job descriptions. In these cases, it can be helpful to know two terms related to accessibility when considering vendor options: VPAT and ACR.

Voluntary Product Accessibility Template

Software vendors that want to demonstrate their compliance to Web Content Accessibility Guidelines can download—free of charge—and complete a [Voluntary Product Accessibility Template](#) (VPAT). VPAT is a registered trademark by the Information Technology Industry Council (ITI). The first nine pages of the VPAT are instructions, which are removed before publishing. The next section, which gets published, consists of three tables listing the Criteria, Conformance Level, and your organization's "Remarks and Explanation" on where possible shortcomings might exist. The three tables are for the three Success Criteria: Level A, Level AA, and Level AAA. Level A has 32 Criteria, AA has 24 Criteria, and AAA has 31 Criteria.

Accessibility Conformance Report

Once the VPAT is completed and the introductory pages are removed, the results are published as an Accessibility Conformance Report (ACR). Sometimes the terms VPAT and ACR are used interchangeably, but they are not the same thing. The Accessibility Conformance Report (ACR) itself must be accessible.

The primary function of an Accessibility Conformance Report is to demonstrate to potential customers that software is compliant with accessibility requirements. This is most important during the procurement stage and helps set vendors apart from one another. Prominent library systems vendor Clarivate/Ex Libris, for example, hosts an [ACR for their discovery platform Primo](#).

Three Stages of Accessible Web Design

Although the best time for making your Web site accessible is before a single page is published, the second-best time is now. Legislation and standards define the parameters for accessibility, but in practice designing accessible Web sites and digital resources is a complicated process – and it's one that never really ends.

"Thinking Accessibly" - Auditing for Accessibility

Accessibility auditing means poring over your digital content with a fine-toothed comb, looking for potential barriers to people with disabilities or those using assistive technology (mostly referring to screen readers, tools which will read aloud content on a computer screen to someone who is visually impaired). To do this successfully, it can be helpful to "think accessibly" – putting yourself into the mindset of someone with a disability and reviewing your content from that person's perspective. Often, accessibility is treated as a laundry list of compliance concerns and "best practices." While this is great for getting started, and

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guides for this exist ([WebAIM has an excellent guide for this purpose](#)), it is more helpful to think critically about the user perspective holistically.

The Mosaic of Disability

First, it is helpful to understand the scope and scale of disability. There is no monolithic disability which affects all people equally. In Web accessibility, visual impairments feature prominently, but even within this category, there are multiple visual impairments – and every individual's experience with their disability will differ. For example, people with colorblindness may have a different type of colorblindness from one another, being unable to perceive different colors from each other and the non-colorblind population. There is also a distinction between someone with low vision versus someone with total blindness. How they interact with your content will be completely different, as will their needs.

Broadly speaking, there are four main categories of disability which require accommodations for digital content:

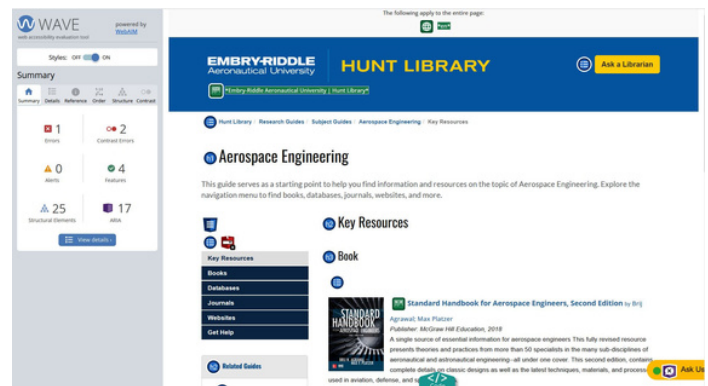
- Visual impairment
- Hearing impairment
- Motor impairment
- Cognitive impairment

Visual impairment includes color blindness, blindness, and low vision. Hearing impairment means both limited hearing as well as total deafness. Motor impairment refers to disabilities ranging from total paralysis to arthritis to broken limbs. Cognitive impairment ranges from learning disabilities to dyslexia, which makes navigating Web content more challenging if it is not designed with accessibility in mind.

The W3C WCAG standards are helpfully arranged in ways to accommodate users with these disabilities. For example, WCAG 2.1 Guideline 1.1 covers all forms of Text Alternatives to visual content required to accommodate people with visual impairments.¹¹

Automated vs. Manual Auditing

Auditing for accessibility involves two processes. The first is automated scanning using one of several software tools and options. At our institution we make extensive use of the [WAVE browser plugin](#) which scans a page's code and identifies several common errors.



(Figure 1: WAVE Plugin [alt text: WAVE plugin view of a research guide highlighting errors and page elements])

Even with an automated tool like WAVE, manual review is necessary. When we audit our Research Guides, for example, we activate WAVE, review any errors detected, and then manually look the page over to determine if the structure makes sense. However, automated tools occasionally make mistakes. In these cases, it is necessary to manually review the HTML code to determine if an accessibility concern exists. A more advanced technique would be to manually review a Web page using a free screen reader such as NVDA.

“Machines Are Dumb” – Remediation

Remediation in accessibility refers to making the changes to your Web site or digital content's HTML code, presentation, or site structure necessary to be usable by people with disabilities. It is helpful to note, especially in this age of “Artificial Intelligence” that machines are, in fact, rather unintelligent. For the most part, they cannot understand implicit semantic connections between content. They

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will generally know only exactly what a human has told them to know. Thus, a screen reader, for example, will only know what it has been told through either HTML code on a Web page or in the tags of a PDF. Remediation is largely a process of explaining your content to a machine so that it can relay that information to a user.

Remediating Web Sites

Web sites are relatively (emphasis on relatively!) simple to remediate. Once errors are identified, they will need to be corrected. Common errors found in Web sites include:

- HTML heading hierarchies not accurately reflecting the document structure (i.e. <h1> tags jumping immediately to an <h3> tag). (WCAG Criteria 1.3.1/1.3.2)
- Images containing text without providing a 1:1 text alternative. (WCAG Criterion 1.1.1)
- Videos embedded on a web page without accurate time-synchronized captions. (WCAG Criterion 1.2.2)
- A page can be navigated entirely without a mouse. (WCAG Criterion 2.1)

Remediating content can often feel more like an art than a science. Crafting alternative text for an image, for example, is much more complicated than simply describing it.

Context matters more than pure description, and there are many cases where alt text is simply unnecessary. The company Siteimprove has a helpful [guide for alt text best practices](#).

Remediating PDFs

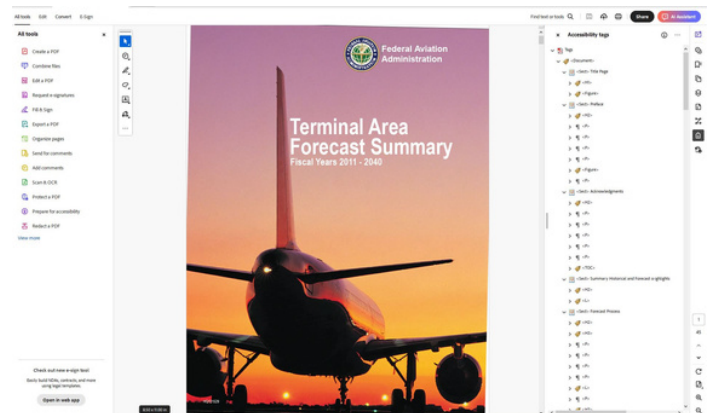
PDF remediation is one of the most challenging tasks for an accessibility specialist. The problem lies with the PDF format itself, which is very difficult for assistive technology to read. The solution is the creation of a tag tree system like HTML code, which explains the semantic relationship between elements of a PDF. Tags are available for editing within Adobe Acrobat Pro, though several solutions exist that aim to improve the process – our own library uses [Equidox](#), for example. None are perfect, however, and all require a clear understanding of your content.

ASCI 604 - Human Factors in the Aviation/Aerospace Industry

The following guide is to help ASCI/MSA 604 students with their research paper or any other research needs on Human Factors.



(Figure 2: Example of an image where alt text is unnecessary. This image serves purely as decoration and does not need description. [alt text: example of a decorative image where alt text is not needed])



(Figure 3: Adobe Tag Tree [alt text: view of the Adobe Acrobat tag tree])

(Adobe has a [series on using the tag tree and remediating PDFs](#). The timestamps are revealing, however, as the series is six hours long.)

The Cycle Repeats – Validation

Validating your digital content takes much the same shape as auditing – in fact, it is really the same step all over again! Accessibility is an ongoing process, especially with content which updates frequently. Our research guides at the Hunt Library, for example, are audited and validated monthly due to the frequency of content updates. Conversely, Web pages which are updated infrequently are audited less frequently.

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Conclusion

This has been a concise overview of the complicated topic of Web accessibility. While it takes years to reach an expert level with digital accessibility, there are numerous resources available to non-specialists to take the first steps necessary in making their online content usable to people with disabilities. It can be intimidating to take those first steps, of course, but as providers of information access, librarians and library staff owe it to our patrons to be inclusive to users of all ages, abilities, and backgrounds.

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Notes

1. “ALA Code of Ethics,” American Library Association, June 29, 2021, <https://www.ala.org/tools/ethics>
2. “The WebAIM Million,” WebAIM, Institute for Disability Research, Policy, and Practice, March 28, 2024, <https://webaim.org/projects/million/>
3. Roberta Null, *Universal Design: Principles and Models*, (CRC Press, 2014) chap. 1, 2, O’Reilly for Higher Education.
4. “New Videos: Perspectives on Web Accessibility – Essential for Some, Useful for All,” W3C, May 17, 2016, <https://www.w3.org/news/2016/new-videos-perspectives-on-web-accessibility-essential-for-some-useful-for-all-2/>
5. “Disability,” World Health Organization, March 7, 2023, <https://www.who.int/news-room/fact-sheets/detail/disability-and-health>
6. “Guidance on Web Accessibility and the ADA,” U.S. Department of Justice Civil Rights Division, March 18, 2022, <https://www.ada.gov/resources/web-guidance/#when-the-ada-requires-web-content-to-be-accessible>
7. “Fact Sheet: New Rule on the Accessibility of Web Content and Mobile Apps Provided by State and Local Governments,” U.S. Department of Justice Civil Rights Division, April 8, 2024, <https://www.ada.gov/resources/2024-03-08-web-rule/>
8. “Applicability & Conformance Requirements,” General Services Administration Section508.gov, May 2018, <https://www.section508.gov/develop/applicability-conformance/>
9. “Web Content Accessibility Guidelines (WCAG) 2.1,” W3C, September 21, 2023, <https://www.w3.org/TR/WCAG21/>
10. Olaf Drümmer and Bettina Chang, PDF/UA in a Nutshell, (Association for Digital Document Standards: 2013), 6-7, <https://pdfa.org/wp-content/uploads/2022/05/PDFUA-in-a-Nutshell.pdf>
11. W3C, “Web Content Accessibility Guidelines,” <https://www.w3.org/TR/WCAG21/#text-alternatives>

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Bibliography

- American Library Association. "ALA Code of Ethics." June 29, 2021. <https://www.ala.org/tools/ethics>
- Drümmer, Olaf, Chang, Bettina. PDF/UA in a Nutshell. Association for Digital Document Standards, 2013. <https://pdfa.org/wp-content/uploads/2022/05/PDFUA-in-a-Nutshell.pdf>
- General Services Administration. "Applicability & Conformance Requirements." Section508.gov. May, 2018. <https://www.section508.gov/develop/applicability-conformance/>
- Institute for Disability Research, Policy, and Practice. "The WebAIM Million." WebAIM. March 28, 2024. <https://webaim.org/projects/million/>
- Null, Roberta. Universal Design: Principles and Models. CRC Press, 2014.
- United States Department of Justice Civil Rights Division. "Fact Sheet: New Rule on the Accessibility of Web Content and Mobile Apps Provided by State and Local Governments." April 8, 2024. <https://www.ada.gov/resources/2024-03-08-web-rule/>
- United States Department of Justice Civil Rights Division. "Guidance on Web Accessibility and the ADA." March 18, 2022. <https://www.ada.gov/resources/web-guidance/#when-the-ada-requires-web-content-to-be-accessible>
- W3C. "New Videos: Perspectives on Web Accessibility – Essential for Some, Useful for All." May 17, 2016. <https://www.w3.org/news/2016/new-videos-perspectives-on-web-accessibility-essential-for-some-useful-for-all-2/>
- W3C. "Web Content Accessibility Guidelines (WCAG) 2.1." September 21, 2023. <https://www.w3.org/TR/WCAG21/>
- World Health Organization. "Disability." March 7, 2023. <https://www.who.int/news-room/fact-sheets/detail/disability-and-health>

