



WHITE PAPER

Accessibility: Why accessibility is critical for business web applications

vaadin}>

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Why accessibility is critical for business web applications

Digital accessibility is now more important than ever.

Digital accessibility (often abbreviated to “a11y”) is about ensuring that everybody can access and use your website or application, regardless of any disability or impairment they may have. In digital media, like websites and web applications, accessibility aims to enable users with disabilities, such as impaired vision, memory problems, or fine motor disabilities, to access and use them.

With an estimated [one billion people](#) experiencing some form of disability, the [digital transformation](#) from office to home office forced by the global pandemic, and new laws and regulations impacting the accessibility requirements on both the public and private sectors, digital accessibility is now more important than ever.

The WebAim [2022 report](#) assessing the top one million home pages concluded that there were over 50 distinct accessibility errors on the average home page. This paper sheds light on accessibility in web application development and reveals at a high-level what businesses and developers can – and should – do to ensure both the usability of their application by people with disabilities and compliance with national accessibility laws.



Digital accessibility in business

Your user experience suffers and you risk legal action if you fail to comply with accessibility requirements.

Awareness of the importance of digital accessibility has recently increased, with many jurisdictions in the EU, the US, and beyond introducing new legislation to compel organizations, especially in the public sector, to ensure access to their web-based services for people with disabilities. In the United States, [federal law allows fines](#) of up to \$75,000 for the first violation and \$150,000 for additional ADA (Americans with Disabilities Act) violations.

A recent high-profile case was the Supreme Court ruling against Domino's, in which a blind customer won a lawsuit against the popular pizza chain when they were unable to process their order via an inaccessible website. In 2021, [more than 2,200](#) comparable suits were filed in the federal courts.

The same story can be heard in Europe, with companies risking locally enforced fines or other legal penalties for failing to comply with EU directives about accessibility.

Besides, accessibility is good for business, with more potential users able to utilize the web app or page as intended and with fewer errors. Accessible user interface (UI) implementations tend to benefit all users; for example, a high-contrast UI is more visible under direct sunlight, and drag & drop features are difficult to use with only one hand.





Dexterity and fine motor control issues

Users with mobility or fine motor skill impairments may be unable to use pointing devices, such as computer mice and trackpads, and instead need to rely on navigating the UI with just a keyboard. Typical dexterity or fine motor control issues may be caused by injuries, defects, or neurological issues, or be situational.

Tap targets

Tap targets, such as the icons or elements that users tap on, should be big enough to be easy to hit with your fingertip. Likewise, with a pointing device, you can also run into issues if the element is so small that it's difficult to point and click with a mouse pointer.

Drag and drop

Drag and drop features can be problematic, since they require a high level of fine control. Always provide a simpler method of achieving the same result, such as arrow buttons.

Gestures

Touchscreens tend to rely on gestures, such as swiping, that can be difficult to perform for a person with dexterity and fine motor skill issues. Always provide an alternative way, too, such as arrow buttons.

Visual impairments

The needs of users with visual impairments range from ensuring sufficient contrast in UI elements to compatibility with assistive technologies, such as screen readers that convert on-screen content to audible speech.

Color blindness

Color blindness is one of the most common vulnerabilities, affecting an [estimated 300 million people](#) worldwide. Color blindness is more prevalent in the male population, with approximately 1 in 12 men having some form of impairment in distinguishing colors. The most common color blindness is the challenge in distinguishing or seeing the difference between red and green, known as deuteranopia.

While color is an effective way to convey information, the issue arises if a person is unable to distinguish and identify the different colors.

Convey your information in more ways than just by color. Use icons or, even better, text.

TIP: You can use a utility tool like ColorOracle to simulate various color deficiencies in order to see how your application looks when viewed by a person with color blindness. Grayscale or monochrome filters that remove all color can also be useful when assessing icons and contrast.

Low vision

Blurry vision or low-contrast vision can be caused by temporary defects or be a permanent disability for a user. Keep sufficiently large font sizes either as default or by option. Make sure the UI scales correctly when a user uses the browser's built-in zoom. Provide an optional high-contrast mode.

Blindness

Total blindness is the least common visual impairment, yet 39 million worldwide suffer from it. Support for screen readers and keyboard compatibility is key to enabling blind users to work with the application.

Demystifying screen readers

Screen reader software is a common aid for people with a visual impairment. They are operating system features or separate utility applications that use text-to-speech to convert the visible user interface into speech. Screen readers enable eyes-free control of an application by letting users navigate through the UI by using a keyboard and listening to audio cues or even haptic feedback, such as vibrations.

Screen readers can also convert output into braille with a special braille keyboard.

Common screen reader software



Windows

NVDA (free)

Jaws (commercial)



macOS

VoiceOver (built-in)



Linux

Orca (free)



Android

TalkBack (free)



iOS

VoiceOver (built-in)



Accessibility standards

The Web Content Accessibility Guidelines (WCAG) 2 is an international shared standard for web content accessibility for individuals, organizations and governments.

The WCAG documents explain how to make web content more accessible to people with disabilities. Web “content” generally refers to the information in a web page or web application, including:

- Natural information, such as text, images, and sounds
- Code or markup that defines structure, presentation, etc.

The WCAG standard is built on three priority levels:

A: Bare minimum (green)

Example:

Color is not used as the only visual means of conveying information, indicating an action, prompting a response, or distinguishing a visual element.

AA: Strongly recommended (yellow)

Example:

The visual presentation of text and images of text has a contrast ratio of at least 4.5:1, except for the following:

- Large Text – Large-scale text and images of large-scale text have a contrast ratio of at least 3:1.
- Incidental – Text or images of text that are part of an inactive user interface component, that are pure decoration, that are not visible to anyone, or that are part of a picture that contains significant other visual content have no contrast requirement.
- Logotypes – Text that is part of a logo or brand name has no contrast requirement.

AAA: Additional recommendations for certain groups of users (red)

Example:

For the visual presentation of blocks of text, a mechanism is available to achieve the following:

- Foreground and background colors can be selected by the user.
- Width is no more than 80 characters or glyphs (40 if CJK).
- Text is not justified (aligned to both the left and the right margins).
- Line spacing (leading) is at least a space-and-a-half within paragraphs, and paragraph spacing is at least 1.5 times larger than the line spacing.
- Text can be resized without assistive technology up to 200 percent in a way that does not require the user to scroll horizontally to read a line of text on a full-screen window.

Most legislation is currently based on WCAG 2.0 or 2.1 level AA.





Accessibility legislation

EU directive 2016/2102

[Directive 2016/2102](#) requires EU member states to implement national legislation establishing accessibility requirements for all websites and applications of public sector bodies, including administrations, schools and universities, law enforcement and courts, and public healthcare providers. The directive is not limited to public-facing services, but also covers non-public websites and applications used by public sector employees.

The directive requires all new public-facing websites released from December 2018 to comply with the WCAG 2.1 Level AA standard. The corresponding deadline for non-public intranet/extranet services came into effect in September 2019.

EU directive 2019/882

This directive, also known as EAA or (EU) 2019/882, expands accessibility requirements to consumer-facing websites and applications in many private sectors, including

- e-commerce
- banking
- transportation
- private healthcare providers

EU states were obligated to implement the directive in their national legislation by June 2022, and the compliance deadline is three years later, in July 2025. The standards on which the EAA requirements are based have not yet been officially defined, but WCAG 2.1 Level AA seems like the most likely solution.

ADA

The ADA (Americans with Disabilities Act) from 1990 and Section 508 of the Rehabilitation Act place similar requirements on accessibility to its EU counterparts. Section 508 applies specifically to federal agencies, as well as private companies receiving federal funding, covers services used by employees and the general public, and defines WCAG 2.0 Level AA as a reference standard.

According to the 2021 State of Digital Accessibility Report by LevelAccess, the number of ADA-related lawsuits in federal courts has seen a significant rise in recent years, from 814 in 2017 to 2,523 in 2020, and 21 percent of surveyed organizations have been sued more than once over digital accessibility.

ADA Title III Website Accessibility Lawsuits in US federal courts: 814 in 2017, 2,258 in 2018, 2,256 in 2019, and 2,523 in 2020. In addition to the EU and the US, many other countries have been reforming their digital accessibility legislation in recent years. The W3C's Web Accessibility Initiative website has a handy list of accessibility legislation in various countries.





Six misconceptions about accessibility

1. Accessibility is an implementable feature

While you can add screen reader support or other assistive features to your web application, they are not guaranteed to work unless the application has been built with accessibility in mind. Even then, testing is crucial in order to ensure that the implementation is successful.

2. Accessibility overlays can make any UI accessible

Accessibility overlays, or widgets, should not be treated as a one-stop solution. While they can improve accessibility, they can often do more harm than good. Treat them as a temporary measure and learn more at overlayfactsheet.com

3. You can add ARIA attributes to make your application or site accessible

Accessible Rich Internet Applications (ARIA) is a set of roles and attributes to make applications and websites more accessible to people with disabilities. However, “The Golden Rule of ARIA” states that it’s best to not use it at all.

ARIA aspires to make non-accessible HTML accessible, but it’s more effective to make the HTML accessible from the beginning.

4. Accessible components guarantee an accessible application

Components that are designed and tested with a keen eye to accessibility provide a solid foundation, but all applications require real-life evaluation to ensure that they are usable by their intended users.

However, inaccessible components guarantee an inaccessible application!

5. Automated testing is enough

There are many automated testing tools available online, with many of them built directly into the browser. While they are good, they do not translate 1:1 into real-life usage. Manual testing is always required in order to ensure accessibility.

6. 100%-accessible applications exist

Accessibility screening or automated testing may return a 100% success rate, yet the application may not be usable by its intended users. Treat accessibility ratings as a guideline, not fact.

Accessibility and Vaadin

We at Vaadin strive to make web apps accessible to all. We thoroughly test the web components in our design system to ensure compatibility with assistive technologies, such as screen readers, and we comply with the latest accessibility standards and regulations. We want to help you build web apps that are highly usable, by everyone.

Read the Vaadin accessibility statement to learn more: <https://vaadin.com/accessibility>

