



DO·IT

Designing Software that is Accessible to Individuals with Disabilities

And Making It More Usable by Everyone

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People with disabilities continue to face challenges in accessing the full range of opportunities available to people without disabilities. Specifically, barriers to standard computer software limit opportunities in education and employment for some people with disabilities. For example, part of a multimedia tutorial that uses voice narration without captioning or transcription is inaccessible to students who are deaf. Similarly, an educational tutorial program that requires the use of a mouse is inaccessible to a student who cannot operate this device. And, a software program that requires an unnecessarily high reading level may be inaccessible to some people who have learning disabilities.

Some individuals use specialized software and hardware, called assistive technology, to operate software products. For example, a person who is blind might use a screen reader program with a speech synthesizer to access the content and functionality of a program. This system enhancement provides access to text presented on the screen and to keyboard commands, but does not allow the person who is blind to view graphics or to access features that require the use of a mouse. To ensure access to all potential users, it is important that software producers avoid creating access barriers to people with disabilities and develop products that are compatible with assistive technology.

Designing products that can be used by people with a wide range of abilities and disabilities is called "universal design." In contrast, many software producers focus on the characteristics of the "average" user. For

example, in a survey of twenty-five award winning companies who produce pre-college instructional software, only two of the nineteen that responded indicated they were aware of accessibility issues. Sixty-five percent of the remaining seventeen companies were not aware of accessibility as an issue, 100% were not currently addressing accessibility in their product development, and 88% had no plans to address accessibility in the future (Golden, 2001).

Clearly, much work needs to be done before software that is accessible to people with disabilities is widely available. This publication summarizes key legal issues, accessibility guidelines, and resources for making software accessible to individuals with disabilities.





Legal Issues

Congress has responded to the need to increase access to products and services for people with disabilities by passing legislation in a range of areas, including education, employment, transportation, assistive technology, and electronic and information technology. Some guarantee the civil rights of individuals with disabilities; others establish procurement requirements for specific agencies; still others impose accessibility requirements on producers of products and providers of services. Some legislation is at the federal level and some is at the state level. Described below are several relevant federal laws in the United States.

Section 504 of the Rehabilitation Act of 1973 requires that programs and services that receive federal funding make those options available to individuals with disabilities and provide reasonable accommodations. In 1986, **Section 508** was added as an amendment to the **Rehabilitation Act of 1973**. Section 508 requires that information technology, they ensure that the electronic and information technology developed, procured, maintained, or used by the federal government be designed to be accessible to people with disabilities.



The Americans with Disabilities Act of 1990 (ADA) and its 2008 amendments is civil rights legislation that builds on and extends the reach of Section 504. It requires that public programs and services be accessible to people with disabilities and that they provide accessible, “effective communication,” regardless of what medium is typically used for that communication. For example, if a software program is used in a course at a postsecondary institution, then the essential content that it delivers should be made accessible to qualified students who have disabilities. The ADA also covers issues related to nondiscrimination on the basis of disability in employment decisions and requires that employers provide reasonable accommodations, that may involve access to software and other electronic and information technology.

Accessibility Standards

The Access Board developed technical and functional performance criteria necessary for electronic and information technology to comply with Section 508. The accessibility standards for software applications set forth in Section 508 (www.access-board.gov/sec508/guide/1194.21.htm) include those that follow. They are soon to be revised.

- a. When software is designed to run on a system that has a keyboard, product functions shall be executable from a keyboard where the function itself or the result of performing a function can be discerned textually.
- b. Applications shall not disrupt or disable activated features of other products that are identified as accessibility features, where those features are developed and documented according to industry standards. Applications also shall not



disrupt or disable activated features of any operating system that are identified as accessibility features where the application programming interface for those accessibility features has been documented by the manufacturer of the operating system and is available to the product developer.

- c. A well-defined on-screen indication of the current focus shall be provided that moves among interactive interface elements as the input focus changes. The focus shall be programmatically exposed so that assistive technology can track focus and focus changes.
- d. Sufficient information about a user interface element including the identity, operation, and state of the element shall be available to assistive technology. When an image represents a program element, the information conveyed by the image must also be available in text.
- e. When bitmap images are used to identify controls, status indicators, or other programmatic elements, the meaning assigned to those images shall be consistent throughout an application's performance.
- f. Textual information shall be provided through operating system functions for displaying text. The minimum information that shall be made available is text content, text input caret location, and text attributes.
- g. Applications shall not override user selected contrast and color selections and other individual display attributes.



- h. When animation is displayed, the information shall be displayable in at least one non-animated presentation mode at the option of the user.
- i. Color coding shall not be used as the only means of conveying information, indicating an action, prompting a response, or distinguishing a visual element.
- j. When a product permits a user to adjust color and contrast settings, a variety of color selections capable of producing a range of contrast levels shall be provided.
- k. Software shall not use flashing or blinking text, objects, or other elements having a flash or blink frequency greater than 2 Hz and lower than 55 Hz.
- l. When electronic forms are used, the form shall allow people using assistive technology to access the information, field elements, and functionality required for completion and submission of the form, including all directions and cues.



Although Section 508 standards specifically apply to federal agencies, they provide a model of accessibility that has been adopted by other organizations as they create policies to meet their obligations under the ADA and other federal and state legislation. Such efforts will result in a greater number of software products accessible to people with disabilities.

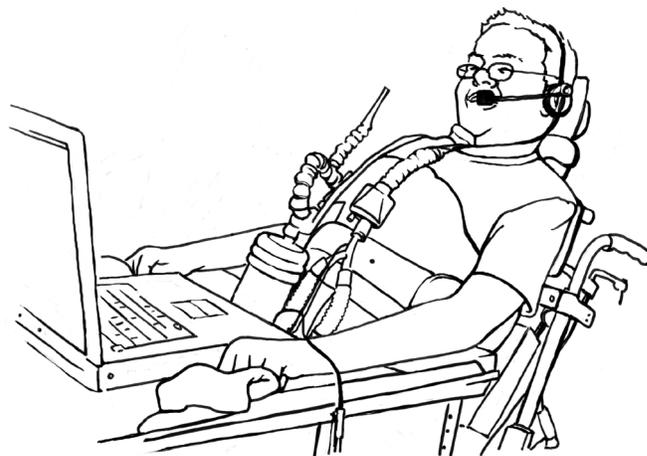
When software is designed to be accessible to individuals with a broad range of disabilities, it is more usable by others. For example, providing captions to a multimedia presentation can provide access to the content for a user who is deaf, that is using the product in a noise-free environment, who wants to search for specific content, or for whom English is a second language. And, making educational software available to a student who has a learning disability that affects reading ability, can make it accessible to younger users as well. Applying accessibility standards in the design of software products helps level the playing field in education and employment.

About DO-IT

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