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## APPENDIX I



### Web Content Accessibility Guidelines (WCAG) 1.0

#### W3C Recommendation 5-May-1999

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### Abstract

These guidelines explain how to make Web content [p. 26] accessible to people with disabilities. The guidelines are intended for all Web content developers [p. 26] (page authors and site designers) and for developers of authoring tools [p. 25]. The primary goal of these guidelines is to promote accessibility. However, following them will also make Web content more available to *all* users, whatever user agent [p. 30] they are using (e.g., desktop browser, voice browser, mobile phone, automobile-based personal computer, etc.) or constraints they may be operating under (e.g., noisy surroundings, under- or over-illuminated rooms, in a hands-free environment, etc.). Following these guidelines will also help people find information on the Web more quickly. These guidelines do not discourage content developers from using images, video, etc., but rather explain how to make multimedia content more accessible to a wide audience.

This is a reference document for accessibility principles and design ideas. Some of the strategies discussed in this document address certain Web internationalization and mobile access concerns. However, this document focuses on accessibility and does not fully address the related concerns of other W3C Activities. Please consult the W3C Mobile Access Activity home page and the W3C Internationalization Activity home page for more information.

This document is meant to be stable and therefore does not provide specific information about browser support for different technologies as that information

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changes rapidly. Instead, the Web Accessibility Initiative (WAI) Web site provides such information (refer to [WAI-UA-SUPPORT] [p. 33] ).

This document includes an appendix that organizes all of the checkpoints [p. 7] by topic and priority. The checkpoints in the appendix link to their definitions in the current document. The topics identified in the appendix include images, multimedia, tables, frames, forms, and scripts. The appendix is available as either a tabular summary of checkpoints or as a simple list of checkpoints.

A separate document, entitled "Techniques for Web Content Accessibility Guidelines 1.0" ([TECHNIQUES] [p. 33] ), explains how to implement the checkpoints defined in the current document. The Techniques Document discusses each checkpoint in more detail and provides examples using the Hypertext Markup Language (HTML), Cascading Style Sheets (CSS), Synchronized Multimedia Integration Language (SMIL), and the Mathematical Markup Language (MathML). The Techniques Document also includes techniques for document validation and testing, and an index of HTML elements and attributes (and which techniques use them). The Techniques Document has been designed to track changes in technology and is expected to be updated more frequently than the current document. **Note.** Not all browsers or multimedia tools may support the features described in the guidelines. In particular, new features of HTML 4.0 or CSS 1 or CSS 2 may not be supported.

"Web Content Accessibility Guidelines 1.0" is part of a series of accessibility guidelines published by the Web Accessibility Initiative. The series also includes User Agent Accessibility Guidelines ([WAI-USERAGENT] [p. 33] ) and Authoring Tool Accessibility Guidelines ([WAI-AUTOOLS] [p. 33] ).

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## Status of this document

This document has been reviewed by W3C Members and other interested parties and has been endorsed by the Director as a W3C Recommendation. It is a stable document and may be used as reference material or cited as a normative reference from another documents. W3C's role in making the Recommendation is to draw attention to the specification and to promote its widespread deployment. This enhances the functionality and universality of the Web.

The English version of this specification is the only normative version. However, for translations in other languages see <http://www.w3.org/WAI/GL/WAI-WEBCONTENT-TRANSLATIONS>.

The list of known errors in this document is available at <http://www.w3.org/WAI/GL/WAI-WEBCONTENT-ERRATA>. Please report errors in this document to [wai-wcag-editor@w3.org](mailto:wai-wcag-editor@w3.org).

A list of current W3C Recommendations and other technical documents can be found at <http://www.w3.org/TR>.

This document has been produced as part of the W3C Web Accessibility Initiative. The goal of the Web Content Guidelines Working Group is discussed in the Working Group charter.

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## 1. Introduction

For those unfamiliar with accessibility issues pertaining to Web page design, consider that many users may be operating in contexts very different from your own:

- They may not be able to see, hear, move, or may not be able to process some types of information easily or at all.
- They may have difficulty reading or comprehending text.
- They may not have or be able to use a keyboard or mouse.
- They may have a text-only screen, a small screen, or a slow Internet connection.
- They may not speak or understand fluently the language in which the document is written.
- They may be in a situation where their eyes, ears, or hands are busy or interfered with (e.g., driving to work, working in a loud environment, etc.).
- They may have an early version of a browser, a different browser entirely, a voice browser, or a different operating system.

Content developers must consider these different situations during page design. While there are several situations to consider, each accessible design choice generally benefits several disability groups at once and the Web community as a whole. For example, by using style sheets [p. 29] to control font styles and eliminating the FONT element, HTML authors will have more control over their pages, make those pages more accessible to people with low vision, and by sharing the style sheets, will often shorten page download times for all users.

The guidelines discuss accessibility issues and provide accessible design solutions. They address typical scenarios (similar to the font style example) that may pose problems for users with certain disabilities. For example, the first guideline [p. 10] explains how content developers can make images accessible. Some users may not be able to see images, others may use text-based browsers that do not support images, while others may have turned off support for images (e.g., due to a slow Internet connection). The guidelines do not suggest avoiding images as a way to improve accessibility. Instead, they explain that providing a text equivalent [p. 27] of the image will make it accessible.

How does a text equivalent make the image accessible? Both words in "text equivalent" are important:

- Text content can be presented to the user as synthesized speech, braille, and visually-displayed text. Each of these three mechanisms uses a different sense -- ears for synthesized speech, tactile for braille, and eyes for visually-displayed text -- making the information accessible to groups representing a variety of sensory and other disabilities.
- In order to be useful, the text must convey the same function or purpose as the image. For example, consider a text equivalent for a photographic image of the Earth as seen from outer space. If the purpose of the image is mostly that of decoration, then the text "Photograph of the Earth as seen from outer space" might fulfill the necessary function. If the purpose of the photograph is to illustrate specific information about world geography, then the text equivalent should convey that information. If the photograph has been designed to tell the user to select the image (e.g., by clicking on it) for information about the earth, equivalent text would be "Information about the Earth". Thus, if the text conveys the same function or purpose for the user with a disability as the image does for other users, then it can be considered a text equivalent.

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Note that, in addition to benefitting users with disabilities, text equivalents can help all users find pages more quickly, since search robots can use the text when indexing the pages.

While Web content developers must provide text equivalents for images and other multimedia content, it is the responsibility of user agents [p. 30] (e.g., browsers and assistive technologies such as screen readers [p. 29], braille displays [p. 26] , etc.) to present the information to the user.

Non-text equivalents of text (e.g., icons, pre-recorded speech, or a video of a person translating the text into sign language) can make documents accessible to people who may have difficulty accessing written text, including many individuals with cognitive disabilities, learning disabilities, and deafness. Non-text equivalents of text can also be helpful to non-readers. An auditory description [p. 28] is an example of a non-text equivalent of visual information. An auditory description of a multimedia presentation's visual track benefits people who cannot see the visual information.

## 2. Themes of Accessible Design

The guidelines address two general themes: ensuring graceful transformation, and making content understandable and navigable.

### 2.1 Ensuring Graceful Transformation

By following these guidelines, content developers can create pages that transform gracefully. Pages that transform gracefully remain accessible despite any of the constraints described in the introduction [p. 5] , including physical, sensory, and cognitive disabilities, work constraints, and technological barriers. Here are some keys to designing pages that transform gracefully:

- Separate structure from presentation (refer to the difference between content, structure, and presentation [p. 26]).
- Provide text (including text equivalents [p. 27]). Text can be rendered in ways that are available to almost all browsing devices and accessible to almost all users.
- Create documents that work even if the user cannot see and/or hear. Provide information that serves the same purpose or function as audio or video in ways suited to alternate sensory channels as well. This does not mean creating a prerecorded audio version of an entire site to make it accessible to users who are blind. Users who are blind can use screen reader [p. 29] technology to render all text information in a page.
- Create documents that do not rely on one type of hardware. Pages should be usable by people without mice, with small screens, low resolution screens, black and white screens, no screens, with only voice or text output, etc.

The theme of graceful transformation is addressed primarily by guidelines 1 to 11.

### 2.2 Making Content Understandable and Navigable

Content developers should make content understandable and navigable. This includes not only making the language clear and simple, but also providing understandable mechanisms for navigating within and between pages. Providing navigation tools and orientation information in pages will maximize accessibility and usability. Not all users can make use of visual clues such as image maps, proportional scroll bars, side-by-

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side frames, or graphics that guide sighted users of graphical desktop browsers. Users also lose contextual information when they can only view a portion of a page, either because they are accessing the page one word at a time (speech synthesis or braille display [p. 26]), or one section at a time (small display, or a magnified display). Without orientation information, users may not be able to understand very large tables, lists, menus, etc.

The theme of making content understandable and navigable is addressed primarily in guidelines 12 to 14.

## 3. How the Guidelines are Organized

This document includes fourteen guidelines, or general principles of accessible design. Each guideline includes:

- The guideline number.
- The statement of the guideline.
- Guideline navigation links. Three links allow navigation to the next guideline (right arrow icon), the previous guideline (left arrow icon), or the current guideline's position in the table of contents (up arrow icon).
- The rationale behind the guideline and some groups of users who benefit from it.
- A list of checkpoint definitions.

The checkpoint definitions in each guideline explain how the guideline applies in typical content development scenarios. Each checkpoint definition includes:

- The checkpoint number.
- The statement of the checkpoint.
- The priority of the checkpoint. Priority 1 checkpoints are highlighted through the use of style sheets.
- Optional informative notes, clarifying examples, and cross-references to related guidelines or checkpoints.
- A link to a section of the Techniques Document ([TECHNIQUES] [p. 33]) where implementations and examples of the checkpoint are discussed.

Each checkpoint is intended to be specific enough so that someone reviewing a page or site may verify that the checkpoint has been satisfied.

### 3.1 Document conventions

The following editorial conventions are used throughout this document:

- Element names are in uppercase letters.
- Attribute names are quoted in lowercase letters.
- Links to definitions are highlighted through the use of style sheets.

## 4. Priorities

Each checkpoint has a priority level assigned by the Working Group based on the checkpoint's impact on accessibility.

[Priority 1] A Web content developer **must** satisfy this checkpoint. Otherwise, one or more groups will find it impossible to access information in the document. Satisfying this checkpoint is a basic requirement for some groups to be able to use Web documents.

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[Priority 2] A Web content developer **should** satisfy this checkpoint. Otherwise, one or more groups will find it difficult to access information in the document. Satisfying this checkpoint will remove significant barriers to accessing Web documents.

[Priority 3] A Web content developer **may** address this checkpoint. Otherwise, one or more groups will find it somewhat difficult to access information in the document. Satisfying this checkpoint will improve access to Web documents.

Some checkpoints specify a priority level that may change under certain (indicated) conditions.

## 5. Conformance

This section defines three levels of conformance to this document:

- **Conformance Level "A"**: all Priority 1 checkpoints are satisfied;
- **Conformance Level "Double-A"**: all Priority 1 and 2 checkpoints are satisfied;
- **Conformance Level "Triple-A"**: all Priority 1, 2, and 3 checkpoints are satisfied;

**Note.** Conformance levels are spelled out in text so they may be understood when rendered to speech.

Claims of conformance to this document must use one of the following two forms.  
Form 1: Specify:

- The guidelines title: "Web Content Accessibility Guidelines 1.0"
- The guidelines URI: <http://www.w3.org/TR/1999/WAI-WEBCONTENT-19990505>
- The conformance level satisfied: "A", "Double-A", or "Triple-A".
- The scope covered by the claim (e.g., page, site, or defined portion of a site.).

Example of Form 1:

This page conforms to W3C's "Web Content Accessibility Guidelines 1.0", available at <http://www.w3.org/TR/1999/WAI-WEBCONTENT-19990505>, level Double-A.

Form 2: Include, on each page-claiming conformance, one of three icons provided by W3C and link the icon to the appropriate W3C explanation of the claim. Information about the icons and how to insert them in pages is available at [WCAG-ICONS] [p. 33].

## 6. Web Content Accessibility Guidelines

### Guideline 1. Provide equivalent alternatives to auditory and visual content.

*Provide content that, when presented to the user, conveys essentially the same function or purpose as auditory or visual content.*

Although some people cannot use images, movies, sounds, applets, etc. directly, they may still use pages that include equivalent [p. 27] information to the visual or auditory content. The equivalent information must serve the same purpose as the visual or auditory content. Thus, a text equivalent for an image of an upward arrow that links to a table of contents could be "Go to table of contents". In some cases, an equivalent should also describe the appearance of visual content (e.g., for complex charts, billboards, or diagrams) or the sound of auditory content (e.g., for audio samples used in education).

This guideline emphasizes the importance of providing text equivalents [p. 27] of

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non-text content (images, pre-recorded audio, video). The power of text equivalents lies in their capacity to be rendered in ways that are accessible to people from various disability groups using a variety of technologies. Text can be readily output to speech synthesizers and braille displays [p. 26] , and can be presented visually (in a variety of sizes) on computer displays and paper. Synthesized speech is critical for individuals who are blind and for many people with the reading difficulties that often accompany cognitive disabilities, learning disabilities, and deafness. Braille is essential for individuals who are both deaf and blind, as well as many individuals whose only sensory disability is blindness. Text displayed visually benefits users who are deaf as well as the majority of Web users.

Providing non-text equivalents (e.g., pictures, videos, and pre-recorded audio) of text is also beneficial to some users, especially nonreaders or people who have difficulty reading. In movies or visual presentations, visual action such as body language or other visual cues may not be accompanied by enough audio information to convey the same information. Unless verbal descriptions of this visual information are provided, people who cannot see (or look at) the visual content will not be able to perceive it.

### *Checkpoints:*

1.1 Provide a text equivalent for every non-text element (e.g., via "alt", "longdesc", or in element content). *This includes:* images, graphical representations of text (including symbols), image map regions, animations (e.g., animated GIFs), applets and programmatic objects, ascii art, frames, scripts, images used as list bullets, spacers, graphical buttons, sounds (played with or without user interaction), stand-alone audio files, audio tracks of video, and video. [Priority 1]

For example, in HTML:

- Use "alt" for the IMG, INPUT, and APPLET elements, or provide a text equivalent in the content of the OBJECT and APPLET elements.
- For complex content (e.g., a chart) where the "alt" text does not provide a complete text equivalent, provide an additional description using, for example, "longdesc" with IMG or FRAME, a link inside an OBJECT element, or a description link [p. 28].
- For image maps, either use the "alt" attribute with AREA, or use the MAP element with A elements (and other text) as content.

Refer also to checkpoint 9.1 and checkpoint 13.10.

Techniques for checkpoint 1.1

1.2 Provide redundant text links for each active region of a server-side image map. [Priority 1]

Refer also to checkpoint 1.5 and checkpoint 9.1.

Techniques for checkpoint 1.2

1.3 Until user agents [p. 30] can automatically read aloud the text equivalent of a visual track, provide an auditory description of the important information of the visual track of a multimedia presentation. [Priority 1]

Synchronize the auditory description [p. 28] with the audio track as per checkpoint 1.4. Refer to checkpoint 1.1 for information about textual equivalents for visual information.

Techniques for checkpoint 1.3

1.4 For any time-based multimedia presentation (e.g., a movie or animation),



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synchronize equivalent alternatives (e.g., captions or auditory descriptions of the visual track) with the presentation. [Priority 1]

Techniques for checkpoint 1.4

- 1.5 Until user agents [p. 30] render text equivalents for client-side image map links, provide redundant text links for each active region of a client-side image map. [Priority 3]

Refer also to checkpoint 1.2 and checkpoint 9.1.

Techniques for checkpoint 1.5

## Guideline 2. Don't rely on color alone.

*Ensure that text and graphics are understandable when viewed without color.*

If color alone is used to convey information, people who cannot differentiate between certain colors and users with devices that have non-color or non-visual displays will not receive the information. When foreground and background colors are too close to the same hue, they may not provide sufficient contrast when viewed using monochrome displays or by people with different types of color deficits.

### *Checkpoints:*

- 2.1 Ensure that all information conveyed with color is also available without color, for example from context or markup. [Priority 1]

Techniques for checkpoint 2.1

- 2.2 Ensure that foreground and background color combinations provide sufficient contrast when viewed by someone having color deficits or when viewed on a black and white screen. [Priority 2 for images, Priority 3 for text].

Techniques for checkpoint 2.2

## Guideline 3. Use markup and style sheets and do so properly.

*Mark up documents with the proper structural elements. Control presentation with style sheets rather than with presentation elements and attributes.*

Using markup improperly -- not according to specification -- hinders accessibility. Misusing markup for a presentation effect (e.g., using a table for layout or a header to change the font size) makes it difficult for users with specialized software to understand the organization of the page or to navigate through it. Furthermore, using presentation markup rather than structural markup to convey structure (e.g., constructing what looks like a table of data with an HTML PRE element) makes it difficult to render a page intelligibly to other devices (refer to the description of difference between content, structure, and presentation [p. 26] ).

Content developers may be tempted to use (or misuse) constructs that achieve a desired formatting effect on older browsers. They must be aware that these practices cause accessibility problems and must consider whether the formatting effect is so critical as to warrant making the document inaccessible to some users.

At the other extreme, content developers must not sacrifice appropriate markup because a certain browser or assistive technology does not process it correctly. For example, it is appropriate to use the TABLE element in HTML to mark up tabular



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information [p. 29] even though some older screen readers may not handle side-by-side text correctly (refer to checkpoint 10.3). Using TABLE correctly and creating tables that transform gracefully (refer to guideline 5) makes it possible for software to render tables other than as two-dimensional grids.

### *Checkpoints:*

- 3.1 When an appropriate markup language exists, use markup rather than images to convey information. [Priority 2]  
For example, use MathML to mark up mathematical equations, and style sheets [p. 29] to format text and control layout. Also, avoid using images to represent text -- use text and style sheets instead. Refer also to guideline 6 and guideline 11.  
Techniques for checkpoint 3.1
- 3.2 Create documents that validate to publish formal grammars. [Priority 2] For example, include a document type declaration at the beginning of a document that refers to a published DTD (e.g., the strict HTML 4.0 DTD).  
Techniques for checkpoint 3.2
- 3.3 Use style sheets to control layout and presentation. [Priority 2] For example, use the CSS 'font' property instead of the HTML FONT element to control font styles.  
Techniques for checkpoint 3.3
- 3.4 Use relative rather than absolute units in markup language attribute values and style sheet property values. [Priority 2]  
For example, in CSS, use 'em' or percentage lengths rather than 'pt' or 'cm', which are absolute units. If absolute units are used, validate that the rendered content is usable (refer to the section on validation [p. 24]).  
Techniques for checkpoint 3.4
- 3.5 Use header elements to convey document structure and use them according to specification. [Priority 2]  
For example, in HTML, use H2 to indicate a subsection of H1. Do not use headers for font effects.  
Techniques for checkpoint 3.5
- 3.6 Mark up lists and list items properly. [Priority 2] For example, in HTML, nest OL, UL, and DL lists properly. Techniques for checkpoint 3.6
- 3.7 Mark up quotations. Do not use quotation markup for formatting effects such as indentation. [Priority 2]  
For example, in HTML, use the Q and BLOCKQUOTE elements to markup short and longer quotations, respectively.  
Techniques for checkpoint 3.7

## Guideline 4. Clarify natural language usage

*Use markup that facilitates pronunciation or interpretation of abbreviated or foreign text.*

When content developers mark up natural language changes in a document, speech synthesizers and braille devices can automatically switch to the new language, making the document more accessible to multilingual users. Content developers should identify the predominant natural language [p. 29] of a document's content (through markup or HTTP headers). Content developers should also provide expansions of abbreviations

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and acronyms.

In addition to helping assistive technologies, natural language markup allows search engines to find key words and identify documents in a desired language. Natural language markup also improves readability of the Web for all people, including those with learning disabilities, cognitive disabilities, or people who are deaf.

When abbreviations and natural language changes are not identified, they may be indecipherable when machine-spoken or brailled.

### *Checkpoints:*

4.1 Clearly identify changes in the natural language of a document's text and any text equivalents [p. 27] (e.g., captions). [Priority 1]

For example, in HTML use the "lang" attribute. In XML, use "xml:lang".

Techniques for checkpoint 4.1

4.2 Specify the expansion of each abbreviation or acronym in a document where it first occurs. [Priority 3]

For example, in HTML, use the "title" attribute of the ABBR and ACRONYM elements. Providing the expansion in the main body of the document also helps document usability.

Techniques for checkpoint 4.2

4.3 Identify the primary natural language of a document. [Priority 3] For example, in HTML set the "lang" attribute on the HTML element. In XML, use "xml:lang".

Server operators should configure servers to take advantage of HTTP content negotiation mechanisms ([RFC2068] [p. 33] , section 14.13) so that clients can automatically retrieve documents of the preferred language.

Techniques for checkpoint 4.3

## Guideline 5. Create tables that transform gracefully.

*Ensure that tables have necessary markup to be transformed by accessible browsers and other user agents.*

Tables should be used to mark up truly tabular information [p. 29] ("data tables"). Content developers should avoid using them to lay out pages ("layout tables"). Tables for any use also present special problems to users of screen readers [p. 29] (refer to checkpoint 10.3). Some user agents [p. 30] allow users to navigate among table cells and access header and other table cell information. Unless marked-up properly, these tables will not provide user agents with the appropriate information. (Refer also to guideline 3.)

The following checkpoints will directly benefit people who access a table through auditory means (e.g., a screen reader or an automobile-based personal computer) or who view only a portion of the page at a time (e.g., users with blindness or low vision using speech output or a braille display, [p. 26] or other users of devices with small displays, etc.).

### *Checkpoints:*

5.1 For data tables, identify row and column headers. [Priority 1] For example, in HTML, use TD to identify data cells and TH to identify headers.

Techniques for checkpoint 5.1

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- 5.2 For data tables that have two or more logical levels of row or column headers, use markup to associate data cells and header cells. [Priority 1]  
For example, in HTML, use THEAD, TFOOT, and TBODY to group rows, COL and COLGROUP to group columns, and the "axis", "scope", and "headers" attributes, to describe more complex relationships among data.  
Techniques for checkpoint 5.2
- 5.3 Do not use tables for layout unless the table makes sense when linearized. Otherwise, if the table does not make sense, provide an alternative equivalent (which may be a linearized version [p. 28] ). [Priority 2]  
**Note.** Once user agents [p. 30] support style sheet positioning, tables should not be used for layout. Refer also to checkpoint 3.3.  
Techniques for checkpoint 5.3
- 5.4 If a table is used for layout, do not use any structural markup for the purpose of visual formatting. [Priority 2]  
For example, in HTML do not use the TH element to cause the content of a (non-table header) cell to be displayed centered and in bold.  
Techniques for checkpoint 5.4
- 5.5 Provide summaries for tables. [Priority 3] For example, in HTML, use the "summary" attribute of the TABLE element.  
Techniques for checkpoint 5.5
- 5.6 Provide abbreviations for header labels. [Priority 3] For example, in HTML, use the "abbr" attribute on the TH element.  
Techniques for checkpoint 5.6  
Refer also to checkpoint 10.3.

## Guideline 6. Ensure that pages featuring new technologies transform gracefully.

*Ensure that pages are accessible even when newer technologies are not supported or are turned off.*

Although content developers are encouraged to use new technologies that solve problems raised by existing technologies, they should know how to make their pages still work with older browsers and people who choose to turn off features.

### *Checkpoints:*

- 6.1 Organize documents so they may be read without style sheets. For example, when an HTML document is rendered without associated style sheets, it must still be possible to read the document. [Priority 1]  
When content is organized logically, it will be rendered in a meaningful order when style sheets are turned off or not supported.  
Techniques for checkpoint 6.1
- 6.2 Ensure that equivalents for dynamic content are updated when the dynamic content changes. [Priority 1]  
Techniques for checkpoint 6.2
- 6.3 Ensure that pages are usable when scripts, applets, or other programmatic objects are turned off or not supported. If this is not possible, provide equivalent information on an alternative accessible page. [Priority 1]
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For example, ensure that links that trigger scripts work when scripts are turned off or not supported (e.g., do not use "javascript:" as the link target). If it is not possible to make the page usable without scripts, provide a text equivalent with the NOSCRIPT element, or use a server-side script instead of a client-side script, or provide an alternative accessible page as per checkpoint 11.4. Refer also to guideline 1.

Techniques for checkpoint 6.3

- 6.4 For scripts and applets, ensure that event handlers are input device-independent. [Priority 2]

Refer to the definition of device independence [p. 26] .

Techniques for checkpoint 6.4

- 6.5 Ensure that dynamic content is accessible or provide an alternative presentation or page. [Priority 2]

For example, in HTML, use NOFRAMES at the end of each frameset. For some applications, server-side scripts may be more accessible than client-side scripts.

Techniques for checkpoint 6.5

Refer also to checkpoint 11.4.

## Guideline 7. Ensure user control of time-sensitive content changes.

*Ensure that moving, blinking, scrolling, or auto-updating objects or pages may be paused or stopped.*

Some people with cognitive or visual disabilities are unable to read moving text quickly enough or at all. Movement can also cause such a distraction that the rest of the page becomes unreadable for people with cognitive disabilities. Screen readers [p. 29] are unable to read moving text. People with physical disabilities might not be able to move quickly or accurately enough to interact with moving objects.

**Note.** All of the following checkpoints involve some content developer responsibility until user agents [p. 30] provide adequate feature control mechanisms.

### *Checkpoints:*

- 7.1 Until user agents [p. 30] allow users to control flickering, avoid causing the screen to flicker. [Priority 1]

**Note.** People with photosensitive epilepsy can have seizures triggered by flickering or flashing in the 4 to 59 flashes per second (Hertz) range with a peak sensitivity at 20 flashes per second as well as quick changes from dark to light (like strobe lights). Techniques for checkpoint 7.1

- 7.2 Until user agents [p. 30] allow users to control blinking, avoid causing content to blink (i.e., change presentation at a regular rate, such as turning on and off). [Priority 2]

Techniques for checkpoint 7.2

- 7.3 Until user agents [p. 30] allow users to freeze moving content, avoid movement in pages. [Priority 2]

When a page includes moving content, provide a mechanism within a script or applet to allow users to freeze motion or updates. Using style sheets with scripting to create movement allows users to turn off or override the effect more

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easily. Refer also to guideline 8.  
Techniques for checkpoint 7.3

- 7.4 Until user agents [p. 30] provide the ability to stop the refresh, do not create periodically auto-refreshing pages. [Priority 2]

For example, in HTML, don't cause pages to auto-refresh with "HTTP-EQUIV=refresh" until user agents allow users to turn off the feature.

Techniques for checkpoint 7.4

- 7.5 Until user agents [p. 30] provide the ability to stop auto-redirect, do not use markup to redirect pages automatically. Instead, configure the server to perform redirects. [Priority 2]

Techniques for checkpoint 7.5

**Note.** The BLINK and MARQUEE elements are not defined in any W3C HTML specification and should not be used. Refer also to guideline 11.

## Guideline 8. Ensure direct accessibility of embedded user interfaces.

*Ensure that the user interface follows principles of accessible design: device-independent access to functionality, keyboard operability, self-voicing, etc.*

When an embedded object has its "own interface", the interface -- like the interface to the browser itself -- must be accessible. If the interface of the embedded object cannot be made accessible, an alternative accessible solution must be provided.

**Note.** For information about accessible interfaces, please consult the User Agent Accessibility Guidelines ([WAI-USERAGENT] [p. 33] ) and the Authoring Tool Accessibility Guidelines ([WAI-AUTOOL] [p. 33] ).

### *Checkpoint:*

- 8.1 Make programmatic elements such as scripts and applets directly accessible or compatible with assistive technologies [Priority 1 if functionality is important [p. 28] and not presented elsewhere, otherwise Priority 2.]

Refer also to guideline 6.

Techniques for checkpoint 8.1

## Guideline 9. Design for device-independence.

*Use features that enable activation of page elements via a variety of input devices.*

Device-independent [p. 26] access means that the user may interact with the user agent or document with a preferred input (or output) device -- mouse, keyboard, voice, head wand, or other. If, for example, a form control can only be activated with a mouse or other pointing device, someone who is using the page without sight, with voice input, or with a keyboard or who is using some other non-pointing input device will not be able to use the form.

**Note.** Providing text equivalents for image maps or images used as links makes it possible for users to interact with them without a pointing device. Refer also to guideline 1.

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Generally, pages that allow keyboard interaction are also accessible through speech input or a command line interface.

*Checkpoints:*

- 9.1 Provide client-side image maps instead of server-side image maps except where the regions cannot be defined with an available geometric shape. [Priority 1]  
Refer also to checkpoint 1.1, checkpoint 1.2, and checkpoint 1.5.  
Techniques for checkpoint 9.1
- 9.2 Ensure that any element that has its own interface can be operated in a device-independent manner. [Priority 2]  
Refer to the definition of device independence [p. 26] . Refer also to guideline 8.  
Techniques for checkpoint 9.2
- 9.3 For scripts, specify logical event handlers rather than device-dependent event handlers. [Priority 2]  
Techniques for checkpoint 9.3
- 9.4 Create a logical tab order through links, form controls, and objects. [Priority 3]  
For example, in HTML, specify tab order via the "tabindex" attribute or ensure a logical page design.  
Techniques for checkpoint 9.4
- 9.5 Provide keyboard shortcuts to important links (including those in client-side image maps [p. 28] ), form controls, and groups of form controls. [Priority 3]  
For example, in HTML, specify shortcuts via the "accesskey" attribute.  
Techniques for checkpoint 9.5

## Guideline 10. Use interim solutions.

*Use interim accessibility solutions so that assistive technologies and older browsers will operate correctly.*

For example, older browsers do not allow users to navigate to empty edit boxes. Older screen readers read lists of consecutive links as one link. These active elements are therefore difficult or impossible to access. Also, changing the current window or popping up new windows can be very disorienting to users who cannot see that this has happened.

**Note.** The following checkpoints apply until user agents [p. 30] (including assistive technologies [p. 25] ) address these issues. These checkpoints are classified as "interim", meaning that the Web Content Guidelines Working Group considers them to be valid and necessary to Web accessibility *as of the publication of this document*. However, the Working Group does not expect these checkpoints to be necessary in the future, once Web technologies have incorporated anticipated features or capabilities.

*Checkpoints:*

- 10.1 Until user agents [p. 30] allow users to turn off spawned windows, do not cause pop-ups or other windows to appear and do not change the current window without informing the user. [Priority 2]  
For example, in HTML, avoid using a frame whose target is a new window.  
Techniques for checkpoint 10.1
- 10.2 Until user agents [p. 30] support explicit associations between labels and form

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controls, for all form controls with implicitly associated labels, ensure that the label is properly positioned. [Priority 2]

The label must immediately precede its control on the same line (allowing more than one control/label per line) or be in the line preceding the control (with only one label and one control per line). Refer also to checkpoint 12.4.

Techniques for checkpoint 10.2

- 10.3 Until user agents [p. 30] (including assistive technologies) render side-by-side text correctly, provide a linear text alternative (on the current page or some other) for *all* tables that lay out text in parallel, word-wrapped columns. [Priority 3]

**Note.** Please consult the definition of linearized table [p. 28] . This checkpoint benefits people with user agents [p. 30] (such as some screen readers [p. 29] ) that are unable to handle blocks of text presented side-by-side; the checkpoint should not discourage content developers from using tables to represent tabular information [p. 29] .

Techniques for checkpoint 10.3

- 10.4 Until user agents [p. 30] handle empty controls correctly, include default, placeholder characters in edit boxes and text areas. [Priority 3]

For example, in HTML, do this for TEXTAREA and INPUT.

Techniques for checkpoint 10.4

- 10.5 Until user agents [p. 30] (including assistive technologies) render adjacent links distinctly, include non-link, printable characters (surrounded by spaces) between adjacent links. [Priority 3]

Techniques for checkpoint 10.5

## Guideline 11. Use W3C technologies and guidelines.

*Use W3C technologies (according to specification) and follow accessibility guidelines. Where it is not possible to use a W3C technology, or doing so results in material that does not transform gracefully, provide an alternative version of the content that is accessible.*

The current guidelines recommend W3C technologies (e.g., HTML, CSS, etc.) for several reasons:

- W3C technologies include "built-in" accessibility features.
- W3C specifications undergo early review to ensure that accessibility issues are considered during the design phase.
- W3C specifications are developed in an open, industry consensus process.

Many non-W3C formats (e.g., PDF, Shockwave, etc.) require viewing with either plug-ins or stand-alone applications. Often, these formats cannot be viewed or navigated with standard user agents [p. 30] (including assistive technologies [p. 25] ). Avoiding non-W3C and non-standard features (proprietary elements, attributes, properties, and extensions) will tend to make pages more accessible to more people using a wider variety of hardware and software. When inaccessible technologies (proprietary or not) must be used, equivalent accessible pages must be provided.

Even when W3C technologies are used, they must be used in accordance with accessibility guidelines. When using new technologies, ensure that they transform gracefully (Refer also to guideline 6.).

**Note.** Converting documents (from PDF, PostScript, RTF, etc.) to W3C markup



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languages (HTML, XML) does not always create an accessible document. Therefore, validate each page for accessibility and usability after the conversion process (refer to the section on validation [p. 24] ). If a page does not readily convert, either revise the page until its original representation converts appropriately or provide an HTML or plain text version.

### *Checkpoints:*

- 11.1 Use W3C technologies when they are available and appropriate for a task and use the latest versions when supported. [Priority 2]

Refer to the list of references [p. 32] for information about where to find the latest W3C specifications and [WAI-UA-SUPPORT] [p. 33] for information about user agent support for W3C technologies.

Techniques for checkpoint 11.1

- 11.2 Avoid deprecated features of W3C technologies. [Priority 2] For example, in HTML, don't use the deprecated [p. 26] FONT element; use style sheets instead (e.g., the 'font' property in CSS).

Techniques for checkpoint 11.2

- 11.3 Provide information so that users may receive documents according to their preferences (e.g., language, content type, etc.) [Priority 3]

**Note.** Use content negotiation where possible.

Techniques for checkpoint 11.3

- 11.4 If, after best efforts [p. 21] , you cannot create an accessible [p. 25] page, provide a link to an alternative page that uses W3C technologies, is accessible, has equivalent [p. 27] information (or functionality), and is updated as often as the inaccessible (original) page. [Priority 1]

Techniques for checkpoint 11.4

**Note.** Content developers should only resort to alternative pages when other solutions fail because alternative pages are generally updated less often than "primary" pages. An out-of-date page may be as frustrating as one that is inaccessible since, in both cases, the information presented on the original page is unavailable. Automatically generating alternative pages may lead to more frequent updates, but content developers must still be careful to ensure that generated pages always make sense, and that users are able to navigate a site by following links on primary pages, alternative pages, or both. Before resorting to an alternative page, reconsider the design of the original page; making it accessible is likely to improve it for all users.

## **Guideline 12. Provide context and orientation information.**

*Provide context and orientation information to help users understand complex pages or elements.*

Grouping elements and providing contextual information about the relationships between elements can be useful for all users. Complex relationships between parts of a page may be difficult for people with cognitive disabilities and people with visual disabilities to interpret.

### *Checkpoints:*

- 12.1 Title each frame to facilitate frame identification and navigation. [Priority 1] For example, in HTML use the "title" attribute on FRAME elements.

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Techniques for checkpoint 12.1

- 12.2 Describe the purpose of frames and how frames relate to each other if it is not obvious by frame titles alone. [Priority 2]

For example, in HTML, use "longdesc," or a description link. [p. 28]

Techniques for checkpoint 12.2

- 12.3 Divide large blocks of information into more manageable groups where natural and appropriate. [Priority 2]

For example, in HTML, use OPTGROUP to group OPTION elements inside a SELECT; group form controls with FIELDSET and LEGEND; use nested lists where appropriate; use headings to structure documents, etc. Refer also to guideline 3.

Techniques for checkpoint 12.3

- 12.4 Associate labels explicitly with their controls. [Priority 2]

For example, in HTML use LABEL and its "for" attribute.

Techniques for checkpoint 12.4

## Guideline 13. Provide clear navigation mechanisms.

*Provide clear and consistent navigation mechanisms -- orientation information, navigation bars, a site map, etc. -- to increase the likelihood that a person will find what they are looking for at a site.*

Clear and consistent navigation mechanisms [p. 29] are important to people with cognitive disabilities or blindness, and benefit all users.

### *Checkpoints:*

- 13.1 Clearly identify the target of each link. [Priority 2] Link text [p. 29] should be meaningful enough to make sense when read out of context -- either on its own or as part of a sequence of links. Link text should also be terse. For example, in HTML, write "Information about version 4.3" instead of "click here". In addition to clear link text, content developers may further clarify the target of a link with an informative link title (e.g., in HTML, the "title" attribute).

Techniques for checkpoint 13.1

- 13.2 Provide metadata to add semantic information to pages and sites. [Priority 2] For example, use RDF ([RDF] [p. 32] ) to indicate the document's author, the type of content, etc. **Note.** Some HTML user agents [p. 30] can build navigation tools from document relations described by the HTML LINK element and "rel" or "rev" attributes (e.g., rel="next", rel="previous", rel="index", etc.). Refer also to checkpoint 13.5.

Techniques for checkpoint 13.2

- 13.3 Provide information about the general layout of a site (e.g., a site map or table of contents). [Priority 2]

In describing site layout, highlight and explain available accessibility features.

Techniques for checkpoint 13.3

- 13.4 Use navigation mechanisms in a consistent manner. [Priority 2]

Techniques for checkpoint 13.4

- 13.5 Provide navigation bars to highlight and give access to the navigation mechanism. [Priority 3]

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#### Techniques for checkpoint 13.5

- 13.6 Group related links, identify the group (for user agents), and, until user agents [p. 30] do so, provide a way to bypass the group. [Priority 3]

#### Techniques for checkpoint 13.6

- 13.7 If search functions are provided, enable different types of searches for different skill levels and preferences. [Priority 3]

#### Techniques for checkpoint 13.7

- 13.8 Place distinguishing information at the beginning of headings, paragraphs, lists, etc. [Priority 3]

**Note.** This is commonly referred to as "front-loading" and is especially helpful for people accessing information with serial devices such as speech synthesizers.

#### Techniques for checkpoint 13.8

- 13.9 Provide information about document collections (i.e., documents comprising multiple pages.). [Priority 3]

For example, in HTML specify document collections with the LINK element and the "rel" and "rev" attributes. Another way to create a collection is by building an archive (e.g., with zip, tar and gzip, stuffit, etc.) of the multiple pages. **Note.** The performance improvement gained by offline processing can make browsing much less expensive for people with disabilities who may be browsing slowly.

#### Techniques for checkpoint 13.9

- 13.10 Provide a means to skip over multi-line ASCII art. [Priority 3]

Refer to checkpoint 1.1 and the example of ascii art in the glossary [p. 25] .

#### Techniques for checkpoint 13.10

### Guideline 14. Ensure that documents are clear and simple.

*Ensure that documents are clear and simple so they may be more easily understood.*

Consistent page layout, recognizable graphics, and easy to understand language benefit all users. In particular, they help people with cognitive disabilities or who have difficulty reading. (However, ensure that images have text equivalents for people who are blind, have low vision, or for any user who cannot or has chosen not to view graphics. Refer also to guideline 1.)

Using clear and simple language promotes effective communication. Access to written information can be difficult for people who have cognitive or learning disabilities. Using clear and simple language also benefits people whose first language differs from your own, including those people who communicate primarily in sign language.

#### *Checkpoints:*

- 14.1 Use the clearest and simplest language appropriate for a site's content. [Priority 1]

#### Techniques for checkpoint 14.1

- 14.2 Supplement text with graphic or auditory presentations where they will facilitate comprehension of the page. [Priority 3]

Refer also to guideline 1.

#### Techniques for checkpoint 14.2

- 14.3 Create a style of presentation that is consistent across pages. [Priority 3]
-

## Appendix A. -- Validation

**Validate accessibility with automatic tools and human review. Automated methods are generally rapid and convenient but cannot identify all accessibility issues. Human review can help ensure clarity of language and ease of navigation.**

Begin using validation methods at the earliest stages of development. Accessibility issues identified early are easier to correct and avoid.

Following are some important validation methods, discussed in more detail in the section on validation in the Techniques Document.

1. Use an automated accessibility tool and browser validation tool. Please note that software tools do not address all accessibility issues, such as the meaningfulness of link text, the applicability of a text equivalent [p. 27], etc.
2. Validate syntax (e.g., HTML, XML, etc.).
3. Validate style sheets (e.g., CSS).
4. Use a text-only browser or emulator.
5. Use multiple graphic browsers, with:
  - sounds and graphics loaded,
  - graphics not loaded,
  - sounds not loaded,
  - no mouse,
  - frames, scripts, style sheets, and applets not loaded
6. Use several browsers, old and new.
7. Use a self-voicing browser, a screen reader, magnification software, a small display, etc.
8. Use spell and grammar checkers. A person reading a page with a speech synthesizer may not be able to decipher the synthesizer's best guess for a word with a spelling error. Eliminating grammar problems increases comprehension.
9. Review the document for clarity and simplicity. Readability statistics, such as those generated by some word processors may be useful indicators of clarity and simplicity. Better still, ask an experienced (human) editor to review written content for clarity. Editors can also improve the usability of documents by identifying potentially sensitive cultural issues that might arise due to language or icon usage.
10. Invite people with disabilities to review documents. Expert and novice users with disabilities will provide valuable feedback about accessibility or usability problems and their severity.

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## Appendix B. -- Glossary

### **Accessible**

Content is accessible when it may be used by someone with a disability.

### **Applet**

A program inserted into a Web page.

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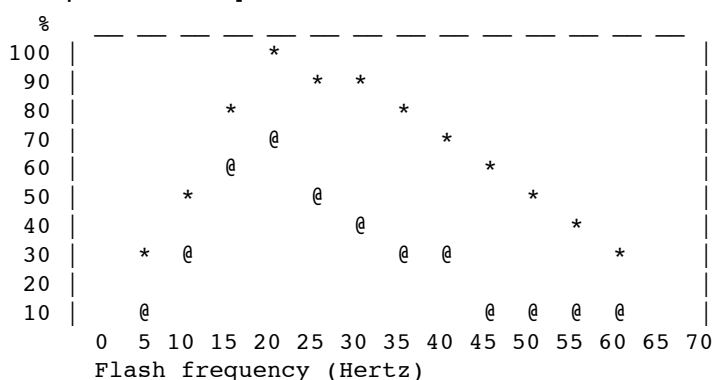
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### **Assistive technology**

Software or hardware that has been specifically designed to assist people with disabilities in carrying out daily activities. Assistive technology includes wheelchairs, reading machines, devices for grasping, etc. In the area of Web Accessibility, common software-based assistive technologies include screen readers, screen magnifiers, speech synthesizers, and voice input software that operate in conjunction with graphical desktop browsers (among other user agents [p. 30] ). Hardware assistive technologies include alternative keyboards and pointing devices.

### **ASCII art**

ASCII art refers to text characters and symbols that are combined to create an image. For example ";" is the smiley emoticon. The following is an ascii figure showing the relationship between flash frequency and photoconvulsive response in patients with eyes open and closed [skip over ascii figure [p. 25] or consult a description of chart]:



### **Authoring tool**

HTML editors, document conversion tools, tools that generate Web content from databases are all authoring tools. Refer to the "Authoring Tool Accessibility Guidelines" ([WAI-AUTOOLS] [p. 33] ) for information about developing accessible tools.

### **Backward compatible**

Design that continues to work with earlier versions of a language, program, etc.

### **Braille**

Braille uses six raised dots in different patterns to represent letters and numbers to be read by people who are blind with their fingertips. The word "Accessible" in braille follows:



A **braille display**, commonly referred to as a "dynamic braille display," raises or lowers dot patterns on command from an electronic device, usually a computer. The result is a line of braille that can change from moment to moment. Current dynamic braille displays range in size from one cell (six or eight dots) to an eighty-cell line, most having between twelve and twenty cells per line.

### **Content developer**

Someone who authors Web pages or designs Web sites.

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**Deprecated**

A deprecated element or attribute is one that has been outdated by newer constructs. Deprecated elements may become obsolete in future versions of HTML. The index of HTML elements and attributes in the Techniques Document indicates which elements and attributes are deprecated in HTML 4.0. Authors should avoid using deprecated elements and attributes. User agents should continue to support for reasons of backward compatibility.

**Device independent**

Users must be able to interact with a user agent (and the document it renders) using the supported input and output devices of their choice and according to their needs. Input devices may include pointing devices, keyboards, braille devices, head wands, microphones, and others. Output devices may include monitors, speech synthesizers, and braille devices. Please note that "device-independent support" does not mean that user agents must support every input or output device. User agents should offer redundant input and output mechanisms for those devices that are supported. For example, if a user agent supports keyboard and mouse input, users should be able to interact with all features using either the keyboard or the mouse.

**Document Content, Structure, and Presentation**

The content of a document refers to what it says to the user through natural language, images, sounds, movies, animations, etc. The structure of a document is how it is organized logically (e.g., by chapter, with an introduction and table of contents, etc.). An element [p. 27] (e.g., P, STRONG, BLOCKQUOTE in HTML) that specifies document structure is called a structural element. The presentation of a document is how the document is rendered (e.g., as print, as a two-dimensional graphical presentation, as a text-only presentation, as synthesized speech, as braille, etc.) An element [p. 27] that specifies document presentation (e.g., B, FONT, CENTER) is called a presentation element. Consider a document header, for example. The content of the header is what the header says (e.g., "Sailboats"). In HTML, the header is a structural element marked up with, for example, an H2 element. Finally, the presentation of the header might be a bold block text in the margin, a centered line of text, a title spoken with a certain voice style (like an aural font), etc.

**Dynamic HTML (DHTML)**

DHTML is the marketing term applied to a mixture of standards including HTML, style sheets [p. 29], the Document Object Model [DOM1] [p. 32] and scripting. However, there is no W3C specification that formally defines DHTML. Most guidelines may be applicable to applications using DHTML, however the following guidelines focus on issues related to scripting and style sheets: guideline 1, guideline 3, guideline 6, guideline 7, and guideline 9.

**Element**

This document uses the term "element" both in the strict SGML sense (an element is a syntactic construct) and more generally to mean a type of content (such as video or sound) or a logical construct (such as a header or list). The second sense emphasizes that a guideline inspired by HTML could easily apply to another markup language. Note that some (SGML) elements have content that is rendered (e.g., the P, LI, or TABLE elements in HTML), some are replaced by external content (e.g., IMG), and some affect processing (e.g., STYLE and SCRIPT cause

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information to be processed by a style sheet or script engine). An element that causes text characters to be part of the document is called a text element.

### **Equivalent**

Content is "equivalent" to other content when both fulfill essentially the same function or purpose upon presentation to the user. In the context of this document, the equivalent must fulfill essentially the same function for the person with a disability (at least insofar as is feasible, given the nature of the disability and the state of technology), as the primary content does for the person without any disability. For example, the text "The Full Moon" might convey the same information as an image of a full moon when presented to users. Note that equivalent information focuses on **fulfilling the same function**. If the image is part of a link and understanding the image is crucial to guessing the link target, an equivalent must also give users an idea of the link target. Providing equivalent information for inaccessible content is one of the primary ways authors can make their documents accessible to people with disabilities.

As part of fulfilling the same function of content an equivalent may involve a description of that content (i.e., what the content looks like or sounds like). For example, in order for users to understand the information conveyed by a complex chart, authors should describe the visual information in the chart. Since text content can be presented to the user as synthesized speech, braille, and visually-displayed text, these guidelines require **text equivalents** for graphic and audio information. Text equivalents must be written so that they convey all essential content. **Non-text equivalents** (e.g., an auditory description of a visual presentation, a video of a person telling a story using sign language as an equivalent for a written story, etc.) also improve accessibility for people who cannot access visual information or written text, including many individuals with blindness, cognitive disabilities, learning disabilities, and deafness. Equivalent information may be provided in a number of ways, including through attributes (e.g., a text value for the "alt" attribute in HTML and SMIL), as part of element content (e.g., the OBJECT in HTML), as part of the document's prose, or via a linked document (e.g., designated by the "longdesc" attribute in HTML or a *description link*). Depending on the complexity of the equivalent, it may be necessary to combine techniques (e.g., use "alt" for an abbreviated equivalent, useful to familiar readers, in addition to "longdesc" for a link to more complete information, useful to first-time readers). The details of how and when to provide equivalent information are part of the Techniques Document ([TECHNIQUES] [p. 33]).

A **text transcript** is a text equivalent of audio information that includes spoken words and non-spoken sounds such as sound effects. A **caption** is a text transcript for the audio track of a video presentation that is synchronized with the video and audio tracks. Captions are generally rendered visually by being superimposed over the video, which benefits people who are deaf and hard-of-hearing, and anyone who cannot hear the audio (e.g., when in a crowded room). A **collated text transcript** combines (collates) captions with text descriptions of video information (descriptions of the actions, body language, graphics, and scene changes of the video track). These text equivalents make presentations accessible to people who are deaf-blind and to people who cannot play movies, animations, etc. It also makes the information available to search engines. One example of a non-text equivalent is an **auditory description** of the key visual elements of a presentation. The description is either a prerecorded human voice or a synthesized voice (recorded or generated on the fly). The auditory description is synchronized with the



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audio track of the presentation, usually during natural pauses in the audio track. Auditory descriptions include information about actions, body language, graphics, and scene changes.

**Image**

A graphical presentation.

**Image map**

An image that has been divided into regions with associated actions. Clicking on an active region causes an action to occur. When a user clicks on an active region of a client-side image map, the user agent calculates in which region the click occurred and follows the link associated with that region. Clicking on an active region of a server-side image map causes the coordinates of the click to be sent to a server, which then performs some action. Content developers can make client-side image maps accessible by providing device-independent access to the same links associated with the image map's regions. Client-side image maps allow the user agent to provide immediate feedback as to whether or not the user's pointer is over an active region.

**Important**

Information in a document is important if understanding that information is crucial to understanding the document.

**Linearized table**

A table rendering process where the contents of the cells become a series of paragraphs (e.g., down the page) one after another. The paragraphs will occur in the same order as the cells are defined in the document source. Cells should make sense when read in order and should include structural elements [p. 26] (that create paragraphs, headers, lists, etc.) so the page makes sense after linearization.

**Link text**

The rendered text content of a link.

**Natural Language**

Spoken, written, or signed human languages such as French, Japanese, American Sign Language, and braille. The natural language of content may be indicated with the "lang" attribute in HTML ([HTML40] [p. 32], section 8.1) and the "xml:lang" attribute in XML ([XML] [p. 33], section 2.12).

**Navigation Mechanism**

A navigation mechanism is any means by which a user can navigate a page or site. Some typical mechanisms include:

*navigation bars*

A navigation bar is a collection of links to the most important parts of a document or site.

*site maps*

A site map provides a global view of the organization of a page or site.

*tables of contents*

A table of contents generally lists (and links to) the most important sections of a document.

**Personal Digital Assistant (PDA)**

A PDA is a small, portable computing device. Most PDAs are used to track personal data such as calendars, contacts, and electronic mail. A PDA is generally a handheld device with a small screen that allows input from various sources.

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**Screen magnifier**

A software program that magnifies a portion of the screen, so that it can be more easily viewed. Screen magnifiers are used primarily by individuals with low vision.

**Screen reader**

A software program that reads the contents of the screen aloud to a user. Screen readers are used primarily by individuals who are blind. Screen readers can usually only read text that is printed, not painted, to the screen.

**Style sheets**

A style sheet is a set of statements that specify presentation of a document. Style sheets may have three different origins: they may be written by content providers, created by users, or built into user agents. In CSS ([CSS2] [p. 32]), the interaction of content provider, user, and user agent style sheets is called the *cascade*.

**Presentation markup**

Is markup that achieves a stylistic (rather than structuring) effect such as the B or I elements in HTML. Note that the STRONG and EM elements are not considered presentation markup since they convey information that is independent of a particular font style.

**Tabular information**

When tables are used to represent logical relationships among data -- text, numbers, images, etc., that information is called "tabular information" and the tables are called "data tables". The relationships expressed by a table may be rendered visually (usually on a two-dimensional grid), aurally (often preceding cells with header information), or in other formats.

**Until user agents...**

In most of the checkpoints, content developers are asked to ensure the accessibility of their pages and sites. However, there are accessibility needs that would be more appropriately met by user agents [p. 30] (including assistive technologies [p. 25] ). As of the publication of this document, not all user agents or assistive technologies provide the accessibility control users require (e.g., some user agents may not allow users to turn off blinking content, or some screen readers may not handle tables well). Checkpoints that contain the phrase "until user agents ..." require content developers to provide additional support for accessibility until most user agents readily available to their audience include the necessary accessibility features. **Note.** The W3C WAI Web site (refer to [WAI-UA-SUPPORT] [p. 33] ) provides information about user agent support for accessibility features. Content developers are encouraged to consult this page regularly for updated information.

**User agent**

Software to access Web content, including desktop graphical browsers, text browsers, voice browsers, mobile phones, multimedia players, plug-ins, and some software assistive technologies used in conjunction with browsers such as screen readers, screen magnifiers, and voice recognition software.

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The original draft of this document is based on "The Unified Web Site Accessibility Guidelines" ([UWSAG] [p. 33] ) compiled by the Trace R & D Center at the University of Wisconsin. That document includes a list of additional contributors.

## References

For the latest version of any W3C specification please consult the list of W3C Technical Reports.

### **[CSS1]**

"CSS, level 1 Recommendation", B. Bos, H. Wium Lie, eds., 17 December 1996, revised 11 January 1999. The CSS1 Recommendation is: <http://www.w3.org/TR/1999/REC-CSS1-19990111>. The latest version of CSS1 is available at: <http://www.w3.org/TR/REC-CSS1>.

### **[CSS2]**

"CSS, level 2 Recommendation", B. Bos, H. Wium Lie, C. Lilley, and I. Jacobs, eds., 12 May 1998. The CSS2 Recommendation is: <http://www.w3.org/TR/1998/REC-CSS2-19980512>. The latest version of CSS2 is available at: <http://www.w3.org/TR/REC-CSS2>.

### **[DOM1]**

"Document Object Model (DOM) Level 1 Specification", V. Apparao, S. Byrne, M. Champion, S. Isaacs, I. Jacobs, A. Le Hors, G. Nicol, J. Robie, R. Sutor, C. Wilson, and L. Wood, eds., 1 October 1998. The DOM Level 1 Recommendation is: <http://www.w3.org/TR/1998/REC-DOM-Level-1-19981001>. The latest version of DOM Level 1 is available at: <http://www.w3.org/TR/REC-DOM-Level-1>

### **[HTML40]**

"HTML 4.0 Recommendation", D. Raggett, A. Le Hors, and I. Jacobs, eds., 17 December 1997, revised 24 April 1998. The HTML 4.0 Recommendation is: <http://www.w3.org/TR/1998/REC-html40-19980424>. The latest version of HTML 4.0 is available at: <http://www.w3.org/TR/REC-html40>.

### **[HTML32]**

"HTML 3.2 Recommendation", D. Raggett, ed., 14 January 1997. The latest version of HTML 3.2 is available at: <http://www.w3.org/TR/REC-html32>.

### **[MATHML]**

"Mathematical Markup Language", P. Ion and R. Miner, eds., 7 April 1998. The MathML 1.0 Recommendation is: <http://www.w3.org/TR/1998/REC-MathML-19980407>. The latest version of MathML 1.0 is available at: <http://www.w3.org/TR/REC-MathML>.

### **[PNG]**

"PNG (Portable Network Graphics) Specification", T. Boutell, ed., T. Lane, contributing

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ed., 1 October 1996. The latest version of PNG 1.0 is: <http://www.w3.org/TR/REC-png>.  
**[RDF]**

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**[TECHNIQUES]**

"Techniques for Web Content Accessibility Guidelines 1.0", W. Chisholm, G. Vanderheiden, I. Jacobs, eds. This document explains how to implement the checkpoints defined in "Web Content Accessibility Guidelines 1.0". The latest draft of the techniques is available at: <http://www.w3.org/TR/WAI-WEBCONTENT-TECHS/>

**[WAI-AUTOOLS]**

"Authoring Tool Accessibility Guidelines", J. Treviranus, J. Richards, I. Jacobs, C. McCathieNeville, eds. The latest Working Draft of these guidelines for designing accessible authoring tools is available at: <http://www.w3.org/TR/WAI-AUTOOLS/>

**[WAI-UA-SUPPORT]**

This page documents known support by user agents (including assistive technologies) of some accessibility features listed in this document. The page is available at: <http://www.w3.org/WAI/Resources/WAI-UA-Support>

**[WAI-USERAGENT]**

"User Agent Accessibility Guidelines", J. Gunderson and I. Jacobs, eds. The latest Working Draft of these guidelines for designing accessible user agents is available at: <http://www.w3.org/TR/WAI-USERAGENT/>

**[WCAG-ICONS]**

Information about conformance icons for this document and how to use them is available at <http://www.w3.org/WAI/WCAG1-Conformance.html>

**[UWSAG]**

"The Unified Web Site Accessibility Guidelines", G. Vanderheiden, W. Chisholm, eds. The Unified Web Site Guidelines were compiled by the Trace R & D Center at the University of Wisconsin under funding from the National Institute on Disability and Rehabilitation Research (NIDRR), U.S. Dept. of Education. This document is available at: [http://www.tracecenter.org/docs/html\\_guidelines/version8.htm](http://www.tracecenter.org/docs/html_guidelines/version8.htm)

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## APPENDIX II



# Web Content Accessibility Guidelines (WCAG) 2.0

W3C Recommendation 11 December 2008

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Please refer to the [errata](#) for this document, which may include normative corrections.

See also [translations](#).

This document is also available in non-normative formats, available from [Alternate Versions of Web Content Accessibility Guidelines 2.0](#).

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## Abstract

Web Content Accessibility Guidelines (WCAG) 2.0 covers a wide range of recommendations for making Web content more accessible. Following these guidelines will make content accessible to a wider range of people with disabilities, including blindness and low vision, deafness and hearing loss, learning disabilities, cognitive limitations, limited movement, speech disabilities, photosensitivity and combinations of these. Following these guidelines will also often make your Web content more usable to users in general.

WCAG 2.0 success criteria are written as testable statements that are not technology-specific. Guidance about satisfying the success criteria in specific technologies, as well as general information about interpreting the success criteria, is provided in separate

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documents. See [Web Content Accessibility Guidelines \(WCAG\) Overview](#) for an introduction and links to WCAG technical and educational material.

WCAG 2.0 succeeds [Web Content Accessibility Guidelines 1.0 \[WCAG10\]](#), which was published as a W3C Recommendation May 1999. Although it is possible to conform either to WCAG 1.0 or to WCAG 2.0 (or both), the W3C recommends that new and updated content use WCAG 2.0. The W3C also recommends that Web accessibility policies reference WCAG 2.0.

## Status of this Document

*This section describes the status of this document at the time of its publication. Other documents may supersede this document. A list of current W3C publications and the latest revision of this technical report can be found in the [W3C technical reports index](#) at <http://www.w3.org/TR/>.*

This is the Web Content Accessibility Guidelines (WCAG) 2.0 [W3C Recommendation](#) from the [Web Content Accessibility Guidelines Working Group](#).

This document has been reviewed by W3C Members, by software developers, and by other W3C groups and interested parties, and is endorsed by the Director as a W3C Recommendation. It is a stable document and may be used as reference material or cited from another document. W3C's role in making the Recommendation is to draw attention to the specification and to promote its widespread deployment. This enhances the functionality and interoperability of the Web.

WCAG 2.0 is supported by the associated non-normative documents, [Understanding WCAG 2.0](#) and [Techniques for WCAG 2.0](#). Although those documents do not have the formal status that WCAG 2.0 itself has, they provide information important to understanding and implementing WCAG.

The Working Group requests that any comments be made using the provided [online comment form](#). If this is not possible, comments can also be sent to [public-comments-wcag20@w3.org](mailto:public-comments-wcag20@w3.org). The [archives for the public comments list](#) are publicly available. Comments received on the WCAG 2.0 Recommendation cannot result in changes to this version of the guidelines, but may be addressed in errata or future versions of WCAG. The Working Group does not plan to make formal responses to comments. Archives of the [WCAG WG mailing list discussions](#) are publicly available, and future work undertaken by the Working Group may address comments received on this document.

This document has been produced as part of the W3C [Web Accessibility Initiative](#) (WAI). The goals of the WCAG Working Group are discussed in the [WCAG Working Group charter](#). The WCAG Working Group is part of the [WAI Technical Activity](#).

This document was produced by a group operating under the [5 February 2004 W3C Patent Policy](#). W3C maintains a [public list of any patent disclosures](#) made in connection with the deliverables of the group; that page also includes instructions for disclosing a patent. An individual who has actual knowledge of a patent which the individual believes contains [Essential Claim\(s\)](#) must disclose the information in accordance with [section 6 of the W3C Patent Policy](#).



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## Introduction

This section is informative.

Web Content Accessibility Guidelines (WCAG) 2.0 defines how to make Web content more accessible to people with disabilities. Accessibility involves a wide range of disabilities, including visual, auditory, physical, speech, cognitive, language, learning, and neurological disabilities. Although these guidelines cover a wide range of issues,

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they are not able to address the needs of people with all types, degrees, and combinations of disability. These guidelines also make Web content more usable by older individuals with changing abilities due to aging and often improve usability for users in general.

WCAG 2.0 is developed through the [W3C process](#) in cooperation with individuals and organizations around the world, with a goal of providing a shared standard for Web content accessibility that meets the needs of individuals, organizations, and governments internationally. WCAG 2.0 builds on WCAG 1.0 [\[WCAG10\]](#) and is designed to apply broadly to different Web technologies now and in the future, and to be testable with a combination of automated testing and human evaluation. For an introduction to WCAG, see the [Web Content Accessibility Guidelines \(WCAG\) Overview](#).

Web accessibility depends not only on accessible content but also on accessible Web browsers and other user agents. Authoring tools also have an important role in Web accessibility. For an overview of how these components of Web development and interaction work together, see:

- [Essential Components of Web Accessibility](#)
- [User Agent Accessibility Guidelines \(UAAG\) Overview](#)
- [Authoring Tool Accessibility Guidelines \(ATAG\) Overview](#)

## WCAG 2.0 Layers of Guidance

The individuals and organizations that use WCAG vary widely and include Web designers and developers, policy makers, purchasing agents, teachers, and students. In order to meet the varying needs of this audience, several layers of guidance are provided including overall *principles*, general *guidelines*, testable *success criteria* and a rich collection of *sufficient techniques*, *advisory techniques*, and *documented common failures* with examples, resource links and code.

**Principles** - At the top are four principles that provide the foundation for Web accessibility: *perceivable*, *operable*, *understandable*, and *robust*. See also [Understanding the Four Principles of Accessibility](#).

**Guidelines** - Under the principles are guidelines. The 12 guidelines provide the basic goals that authors should work toward in order to make content more accessible to users with different disabilities. The guidelines are not testable, but provide the framework and overall objectives to help authors understand the success criteria and better implement the techniques.

**Success Criteria** - For each guideline, testable success criteria are provided to allow WCAG 2.0 to be used where requirements and conformance testing are necessary such as in design specification, purchasing, regulation, and contractual agreements. In order to meet the needs of different groups and different situations, three levels of conformance are defined: A (lowest), AA, and AAA (highest). Additional information on WCAG levels can be found in [Understanding Levels of Conformance](#).

**Sufficient and Advisory Techniques** - For each of the *guidelines* and *success criteria* in the WCAG 2.0 document itself, the working group has also documented a wide variety of *techniques*. The techniques are informative and fall into two categories: those that are *sufficient* for meeting the success criteria and those that are *advisory*. The advisory techniques go beyond what is required by the individual success criteria and

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allow authors to better address the guidelines. Some advisory techniques address accessibility barriers that are not covered by the testable success criteria. Where common failures are known, these are also documented. See also [Sufficient and Advisory Techniques in Understanding WCAG 2.0](#).

All of these layers of guidance (principles, guidelines, success criteria, and sufficient and advisory techniques) work together to provide guidance on how to make content more accessible. Authors are encouraged to view and apply all layers that they are able to, including the advisory techniques, in order to best address the needs of the widest possible range of users.

Note that even content that conforms at the highest level (AAA) will not be accessible to individuals with all types, degrees, or combinations of disability, particularly in the cognitive language and learning areas. Authors are encouraged to consider the full range of techniques, including the advisory techniques, as well as to seek relevant advice about current best practice to ensure that Web content is accessible, as far as possible, to this community. [Metadata](#) may assist users in finding content most suitable for their needs.

## WCAG 2.0 Supporting Documents

The WCAG 2.0 document is designed to meet the needs of those who need a stable, referenceable technical standard. Other documents, called supporting documents, are based on the WCAG 2.0 document and address other important purposes, including the ability to be updated to describe how WCAG would be applied with new technologies.

Supporting documents include:

1. [How to Meet WCAG 2.0](#) - A customizable quick reference to WCAG 2.0 that includes all of the guidelines, success criteria, and techniques for authors to use as they are developing and evaluating Web content.
2. [Understanding WCAG 2.0](#) - A guide to understanding and implementing WCAG 2.0. There is a short "Understanding" document for each guideline and success criterion in WCAG 2.0 as well as key topics.
3. [Techniques for WCAG 2.0](#) - A collection of techniques and common failures, each in a separate document that includes a description, examples, code and tests.
4. [The WCAG 2.0 Documents](#) - A diagram and description of how the technical documents are related and linked.

See [Web Content Accessibility Guidelines \(WCAG\) Overview](#) for a description of the WCAG 2.0 supporting material, including education resources related to WCAG 2.0. Additional resources covering topics such as the business case for Web accessibility, planning implementation to improve the accessibility of Web sites, and accessibility policies are listed in [WAI Resources](#).

## Important Terms in WCAG 2.0

WCAG 2.0 includes three important terms that are different from WCAG 1.0. Each of these is introduced briefly below and defined more fully in the glossary.

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## Web Page

It is important to note that, in this standard, the term "Web page" includes much more than static HTML pages. It also includes the increasingly dynamic Web pages that are emerging on the Web, including "pages" that can present entire virtual interactive communities. For example, the term "Web page" includes an immersive, interactive movie-like experience found at a single URI. For more information, see [Understanding "Web Page"](#).

## Programmatically Determined

Several success criteria require that content (or certain aspects of content) can be "programmatically determined." This means that the content is delivered in such a way that user agents, including assistive technologies, can extract and present this information to users in different modalities. For more information, see [Understanding Programmatically Determined](#).

## Accessibility Supported

Using a technology in a way that is accessibility supported means that it works with assistive technologies (AT) and the accessibility features of operating systems, browsers, and other user agents. Technology features can only be relied upon to conform to WCAG 2.0 success criteria if they are used in a way that is "accessibility supported". Technology features can be used in ways that are not accessibility supported (do not work with assistive technologies, etc.) as long as they are not relied upon to conform to any success criterion (i.e., the same information or functionality is also available another way that is supported).

The definition of "accessibility supported" is provided in the [Appendix A: Glossary](#) section of these guidelines. For more information, see [Understanding Accessibility Support](#).

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# WCAG 2.0 Guidelines

This section is normative.

## Principle 1: Perceivable - Information and user interface components must be presentable to users in ways they can perceive.

Guideline 1.1 Text Alternatives: Provide text alternatives for any non-text content so that it can be changed into other forms people need, such as large print, braille, speech, symbols or simpler language. [Understanding Guideline 1.1](#) <sup>68</sup>

**1.1.1 Non-text Content:** All non-text content that is presented to the user has a text alternative that serves the equivalent purpose, except for the situations listed below. (Level A)

<a href="#">How to Meet 1.1.1</a> <a href="#">Understanding 1.1.1</a>
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<sup>68</sup> Any Guideline provides a link to help understanding the Guideline; but since this appendix does not include active links, we are not including this link in the following Guidelines.

<sup>69</sup> Any Success Criteria provide a box with two links to help on how meeting and understanding the Success Criteria; since this appendix does not include active links, we do not include this box in the following Success Criteria.

- 
- **Controls, Input:** If non-text content is a control or accepts user input, then it has a name that describes its purpose. (Refer to [Guideline 4.1](#) for additional requirements for controls and content that accepts user input.)
  - **Time-Based Media:** If non-text content is time-based media, then text alternatives at least provide descriptive identification of the non-text content. (Refer to [Guideline 1.2](#) for additional requirements for media.)
  - **Test:** If non-text content is a test or exercise that would be invalid if presented in text, then text alternatives at least provide descriptive identification of the non-text content.
  - **Sensory:** If non-text content is primarily intended to create a specific sensory experience, then text alternatives at least provide descriptive identification of the non-text content.
  - **CAPTCHA:** If the purpose of non-text content is to confirm that content is being accessed by a person rather than a computer, then text alternatives that identify and describe the purpose of the non-text content are provided, and alternative forms of CAPTCHA using output modes for different types of sensory perception are provided to accommodate different disabilities.
  - **Decoration, Formatting, Invisible:** If non-text content is pure decoration, is used only for visual formatting, or is not presented to users, then it is implemented in a way that it can be ignored by assistive technology.

#### Guideline 1.2 Time-based Media: Provide alternatives for time-based media.

**1.2.1 Audio-only and Video-only (Prerecorded):** For prerecorded audio-only and prerecorded video-only media, the following are true, except when the audio or video is a media alternative for text and is clearly labeled as such: (Level A)

- **Prerecorded Audio-only:** An alternative for time-based media is provided that presents equivalent information for prerecorded audio-only content.
- **Prerecorded Video-only:** Either an alternative for time-based media or an audio track is provided that presents equivalent information for prerecorded video-only content.

**1.2.2 Captions (Prerecorded):** Captions are provided for all prerecorded audio content in synchronized media, except when the media is a media alternative for text and is clearly labeled as such. (Level A)

**1.2.3 Audio Description or Media Alternative (Prerecorded):** An alternative for time-based media or audio description of the prerecorded video content is provided for synchronized media, except when the media is a media alternative for text and is clearly labeled as such. (Level A)

**1.2.4 Captions (Live):** Captions are provided for all live audio content in synchronized media. (Level AA)

**1.2.5 Audio Description (Prerecorded):** Audio description is provided for all prerecorded video content in synchronized media. (Level AA)

**1.2.6 Sign Language (Prerecorded):** Sign language interpretation is provided for all prerecorded audio content in synchronized media. (Level AAA)

**1.2.7 Extended Audio Description (Prerecorded):** Where pauses in foreground audio are insufficient to allow audio descriptions to convey the sense of the video, extended audio description is provided for all prerecorded video content in synchronized media. (Level AAA)

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**1.2.8 Media Alternative (Prerecorded):** An alternative for time-based media is provided for all prerecorded synchronized media and for all prerecorded video-only media. (Level AAA)

**1.2.9 Audio-only (Live):** An alternative for time-based media that presents equivalent information for live audio-only content is provided. (Level AAA)

Guideline 1.3 **Adaptable:** Create content that can be presented in different ways (for example simpler layout) without losing information or structure.

**1.3.1 Info and Relationships:** Information, structure, and relationships conveyed through presentation can be programmatically determined or are available in text. (Level A)

**1.3.2 Meaningful Sequence:** When the sequence in which content is presented affects its meaning, a correct reading sequence can be programmatically determined. (Level A)

**1.3.3 Sensory Characteristics:** Instructions provided for understanding and operating content do not rely solely on sensory characteristics of components such as shape, size, visual location, orientation, or sound. (Level A)

*Note:* For requirements related to color, refer to [Guideline 1.4](#).

Guideline 1.4 **Distinguishable:** Make it easier for users to see and hear content including separating foreground from background.

**1.4.1 Use of Color:** Color is not used as the only visual means of conveying information, indicating an action, prompting a response, or distinguishing a visual element. (Level A)

*Note:* This success criterion addresses color perception specifically. Other forms of perception are covered in [Guideline 1.3](#) including programmatic access to color and other visual presentation coding.

**1.4.2 Audio Control:** If any audio on a Web page plays automatically for more than 3 seconds, either a mechanism is available to pause or stop the audio, or a mechanism is available to control audio volume independently from the overall system volume level. (Level A)

*Note:* Since any content that does not meet this success criterion can interfere with a user's ability to use the whole page, all content on the Web page (whether or not it is used to meet other success criteria) must meet this success criterion. See [Conformance Requirement 5: Non- Interference](#).

**1.4.3 Contrast (Minimum):** The visual presentation of text and images of text has a contrast ratio of at least 4.5:1, except for the following: (Level AA)

- **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 minimum contrast requirement.

**1.4.4 Resize text:** Except for captions and images of text, text can be resized without assistive technology up to 200 percent without loss of content or functionality. (Level AA)

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**1.4.5 Images of Text:** If the technologies being used can achieve the visual presentation, text is used to convey information rather than images of text except for the following: (Level AA)

- **Customizable:** The image of text can be visually customized to the user's requirements;
- **Essential:** A particular presentation of text is essential to the information being conveyed.

*Note:* Logotypes (text that is part of a logo or brand name)

**1.4.6 Contrast (Enhanced):** The visual presentation of text and images of text has a contrast ratio of at least 7:1, except for the following: (Level AAA)

- **Large Text:** Large-scale text and images of large-scale text have a contrast ratio of at least 4.5:1; **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 minimum contrast requirement.

**1.4.7 Low or No Background Audio:** For prerecorded audio-only content that (1) contains primarily speech in the foreground, (2) is not an audio CAPTCHA or audio logo, and (3) is not vocalization intended to be primarily musical expression such as singing or rapping, at least one of the following is true: (Level AAA)

- **No Background:** The audio does not contain background sounds.
- **Turn Off:** The background sounds can be turned off.
- **20 dB:** The background sounds are at least 20 decibels lower than the foreground speech content, with the exception of occasional sounds that last for only one or two seconds.

*Note:* Per the definition of "decibel," background sound that meets this requirement will be approximately four times quieter than the foreground speech content.

**1.4.8 Visual Presentation:** For the visual presentation of blocks of text, a mechanism is available to achieve the following: (Level AAA)

1. Foreground and background colors can be selected by the user.
2. Width is no more than 80 characters or glyphs (40 if CJK).
3. Text is not justified (aligned to both the left and the right margins).
4. Line spacing (leading) is at least space-and-a-half within paragraphs, and paragraph spacing is at least 1.5 times larger than the line spacing.
5. 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.

**1.4.9 Images of Text (No Exception):** Images of text are only used for pure decoration or where a particular presentation of text is essential to the information being conveyed. (Level AAA)

*Note:* Logotypes (text that is part of a logo or brand name) are considered essential.

**Principle 2: Operable - User interface components and navigation must be operable.**

Guideline 2.1 Keyboard Accessible: Make all functionality available from a keyboard

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**2.1.1 Keyboard:** All functionality of the content is operable through a keyboard interface without requiring specific timings for individual keystrokes, except where the underlying function requires input that depends on the path of the user's movement and not just the endpoints. (Level A)

*Note 1:* This exception relates to the underlying function, not the input technique. For example, if using handwriting to enter text, the input technique (handwriting) requires path-dependent input but the underlying function (text input) does not.

*Note 2:* This does not forbid and should not discourage providing mouse input or other input methods in addition to keyboard operation.

**2.1.2 No Keyboard Trap:** If keyboard focus can be moved to a component of the page using a keyboard interface, then focus can be moved away from that component using only a keyboard interface, and, if it requires more than unmodified arrow or tab keys or other standard exit methods, the user is advised of the method for moving focus away. (Level A)

*Note:* Since any content that does not meet this success criterion can interfere with a user's ability to use the whole page, all content on the Web page (whether it is used to meet other success criteria or not) must meet this success criterion. See [Conformance Requirement 5: Non- Interference](#).

**2.1.3 Keyboard (No Exception):** All functionality of the content is operable through a keyboard interface without requiring specific timings for individual keystrokes. (Level AAA)

Guideline 2.2 Enough Time: Provide users enough time to read and use content.

**2.2.1 Timing Adjustable:** For each time limit that is set by the content, at least one of the following is true: (Level A)

- **Turn off:** The user is allowed to turn off the time limit before encountering it; or
- **Adjust:** The user is allowed to adjust the time limit before encountering it over a wide range that is at least ten times the length of the default setting; or
- **Extend:** The user is warned before time expires and given at least 20 seconds to extend the time limit with a simple action (for example, "press the space bar"), and the user is allowed to extend the time limit at least ten times; or
- **Real-time Exception:** The time limit is a required part of a real-time event (for example, an auction), and no alternative to the time limit is possible; or
- **Essential Exception:** The time limit is essential and extending it would invalidate the activity; or
- **20 Hour Exception:** The time limit is longer than 20 hours.

*Note:* This success criterion helps ensure that users can complete tasks without unexpected changes in content or context that are a result of a time limit. This success criterion should be considered in conjunction with [Success Criterion 3.2.1](#), which puts limits on changes of content or context as a result of user action.

**2.2.2 Pause, Stop, Hide:** For moving, blinking, scrolling, or auto-updating information, all of the following are true: (Level A)

- **Moving, blinking, scrolling:** For any moving, blinking or scrolling information that (1) starts automatically, (2) lasts more than five seconds, and (3) is presented in parallel with other content, there is a mechanism for the user to pause, stop, or hide it unless the movement, blinking, or scrolling is part of an activity where it is essential; and

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- **Auto-updating:** For any auto-updating information that (1) starts automatically and (2) is presented in parallel with other content, there is a mechanism for the user to pause, stop, or hide it or to control the frequency of the update unless the auto-updating is part of an activity where it is essential.

*Note 1:* For requirements related to flickering or flashing content, refer to [Guideline 2.3](#).

*Note 2:* Since any content that does not meet this success criterion can interfere with a user's ability to use the whole page, all content on the Web page (whether it is used to meet other success criteria or not) must meet this success criterion. See [Conformance Requirement 5: Non- Interference](#).

*Note 3:* Content that is updated periodically by software or that is streamed to the user agent is not required to preserve or present information that is generated or received between the initiation of the pause and resuming presentation, as this may not be technically possible, and in many situations could be misleading to do so.

*Note 4:* An animation that occurs as part of a preload phase or similar situation can be considered essential if interaction cannot occur during that phase for all users and if not indicating progress could confuse users or cause them to think that content was frozen or broken.

**2.2.3 No Timing:** Timing is not an essential part of the event or activity presented by the content, except for non- interactive synchronized media and real-time events. (Level AAA)

**2.2.4 Interruptions:** Interruptions can be postponed or suppressed by the user, except interruptions involving an emergency. (Level AAA)

**2.2.5 Re-authenticating:** When an authenticated session expires, the user can continue the activity without loss of data after re-authenticating. (Level AAA)

[Guideline 2.3](#) Seizures: Do not design content in a way that is known to cause seizures.

**2.3.1 Three Flashes or Below Threshold:** Web pages do not contain anything that flashes more than three times in any one second period, or the flash is below the general flash and red flash thresholds. (Level A)

*Note:* Since any content that does not meet this success criterion can interfere with a user's ability to use the whole page, all content on the Web page (whether it is used to meet other success criteria or not) must meet this success criterion. See [Conformance Requirement 5: Non- Interference](#)

**2.3.2 Three Flashes:** Web pages do not contain anything that flashes more than three times in any one second period. (Level AAA)

[Guideline 2.4](#) Navigable: Provide ways to help users navigate, find content, and determine where they are.

**2.4.1 Bypass Blocks:** A mechanism is available to bypass blocks of content that are repeated on multiple Web pages. (Level A)

**2.4.2 Page Titled:** Web pages have titles that describe topic or purpose. (Level A)

**2.4.3 Focus Order:** If a Web page can be navigated sequentially and the navigation sequences affect meaning or operation, focusable components receive focus in an order that preserves meaning and operability. (Level A)

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**2.4.4 Link Purpose (In Context):** The purpose of each link can be determined from the link text alone or from the link text together with its programmatically determined link context, except where the purpose of the link would be ambiguous to users in general. (Level A)

**2.4.5 Multiple Ways:** More than one way is available to locate a Web page within a set of Web pages except where the Web Page is the result of, or a step in, a process. (Level AA)

**2.4.6 Headings and Labels:** Headings and labels describe topic or purpose. (Level AA)

**2.4.7 Focus Visible:** Any keyboard operable user interface has a mode of operation where the keyboard focus indicator is visible. (Level AA)

**2.4.8 Location:** Information about the user's location within a set of Web pages is available. (Level AAA)

**2.4.9 Link Purpose (Link Only):** A mechanism is available to allow the purpose of each link to be identified from link text alone, except where the purpose of the link would be ambiguous to users in general. (Level AAA)

**2.4.10 Section Headings:** Section headings are used to organize the content. (Level AAA)

*Note 1:* "Heading" is used in its general sense and includes titles and other ways to add a heading to different types of content.

*Note 2:* This success criterion covers sections within writing, not user interface components. User Interface components are covered under [Success Criterion 4.1.2](#).

## Principle 3: Understandable - Information and the operation of user interface must be understandable.

Guideline 3.1 Readable: Make text content readable and understandable.

**3.1.1 Language of Page:** The default human language of each Web page can be programmatically determined. (Level A)

**3.1.2 Language of Parts:** The human language of each passage or phrase in the content can be programmatically determined except for proper names, technical terms, words of indeterminate language, and words or phrases that have become part of the vernacular of the immediately surrounding text. (Level AA)

**3.1.3 Unusual Words:** A mechanism is available for identifying specific definitions of words or phrases used in an unusual or restricted way, including idioms and jargon. (Level AAA)

**3.1.4 Abbreviations:** A mechanism for identifying the expanded form or meaning of abbreviations is available. (Level AAA)

**3.1.5 Reading Level:** When text requires reading ability more advanced than the lower secondary education level after removal of proper names and titles, supplemental content, or a version that does not require reading ability more advanced than the lower secondary education level, is available. (Level AAA)

**3.1.6 Pronunciation:** A mechanism is available for identifying specific pronunciation of words where meaning of the words, in context, is ambiguous without knowing the

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pronunciation. (Level AAA)

Guideline 3.2 Predictable: Make Web pages appear and operate in predictable ways.

**3.2.1 On Focus**: When any component receives focus, it does not initiate a change of context. (Level A)

**3.2.2 On Input**: Changing the setting of any user interface component does not automatically cause a change of context unless the user has been advised of the behavior before using the component. (Level A)

**3.2.3 Consistent Navigation**: Navigational mechanisms that are repeated on multiple Web pages within a set of Web pages occur in the same relative order each time they are repeated, unless a change is initiated by the user. (Level AA)

**3.2.4 Consistent Identification**: Components that have the same functionality within a set of Web pages are identified consistently. (Level AA)

**3.2.5 Change on Request**: Changes of context are initiated only by user request or a mechanism is available to turn off such changes. (Level AAA) component does not automatically cause a change of context unless the user has been advised of the behavior before using the component. (Level A)

**3.2.3 Consistent Navigation**: Navigational mechanisms that are repeated on multiple Web pages within a set of Web pages occur in the same relative order each time they are repeated, unless a change is initiated by the user. (Level AA)

**3.2.4 Consistent Identification**: Components that have the same functionality within a set of Web pages are identified consistently. (Level AA)

**3.2.5 Change on Request**: Changes of context are initiated only by user request or a mechanism is available to turn off such changes. (Level AAA)

Guideline 3.3 Input Assistance: Help users avoid and correct mistakes.

**3.3.1 Error Identification**: If an input error is automatically detected, the item that is in error is identified and the error is described to the user in text. (Level A)

**3.3.2 Labels or Instructions**: Labels or instructions are provided when content requires user input. (Level A)

**3.3.3 Error Suggestion**: If an input error is automatically detected and suggestions for correction are known, then the suggestions are provided to the user, unless it would jeopardize the security or purpose of the content. (Level AA)

**3.3.4 Error Prevention (Legal, Financial, Data)**: For Web pages that cause legal commitments or financial transactions for the user to occur, that modify or delete user- controllable data in data storage systems, or that submit user test responses, at least one of the following is true: (Level AA)

1. **Reversible**: Submissions are reversible.
2. **Checked**: Data entered by the user is checked for input errors and the user is provided an opportunity to correct them.
3. **Confirmed**: A mechanism is available for reviewing, confirming, and correcting information before finalizing the submission.

**3.3.5 Help**: Context-sensitive help is available. (Level AAA)

**3.3.6 Error Prevention (All)**: For Web pages that require the user to submit information, at least one of the following is true: (Level AAA)

- 
1. **Reversible:** Submissions are reversible.
  2. **Checked:** Data entered by the user is checked for input errors and the user is provided an opportunity to correct them.
  3. **Confirmed:** A mechanism is available for reviewing, confirming, and correcting information before finalizing the submission.

Principle 4: Robust - Content must be robust enough that it can be interpreted reliably by a wide variety of user agents, including assistive technologies.

Guideline 4.1 Compatible: Maximize compatibility with current and future user agents, including assistive technologies

**4.1.1 Parsing:** In content implemented using markup languages, elements have complete start and end tags, elements are nested according to their specifications, elements do not contain duplicate attributes, and any IDs are unique, except where the specifications allow these features. (Level A)

*Note:* Start and end tags that are missing a critical character in their formation, such as a closing angle bracket or a mismatched attribute value quotation mark are not complete.

**4.1.2 Name, Role, Value:** For all user interface components (including but not limited to: form elements, links and components generated by scripts), the name and role can be programmatically determined; states, properties, and values that can be set by the user can be programmatically set; and notification of changes to these items is available to user agents, including assistive technologies. (Level A)

*Note:* This success criterion is primarily for Web authors who develop or script their own user interface components. For example, standard HTML controls already meet this success criterion when used according to specification.

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## Conformance

This section is normative.

This section lists requirements for conformance to WCAG 2.0. It also gives information about how to make conformance claims, which are optional. Finally, it describes what it means to be accessibility supported, since only accessibility-supported ways of using technologies can be relied upon for conformance. [Understanding Conformance](#) includes further explanation of the accessibility-supported concept.

## Conformance Requirements

In order for a Web page to conform to WCAG 2.0, all of the following conformance requirements must be satisfied:

1. **Conformance Level:** One of the following levels of conformance is met in full.
  - **Level A:** For Level A conformance (the minimum level of conformance), the Web page satisfies all the Level A Success Criteria, or a conforming alternate version is provided.
  - **Level AA:** For Level AA conformance, the Web page satisfies all the Level A and

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Level AA Success Criteria, or a Level AA conforming alternate version is provided.

- **Level AAA:** For Level AAA conformance, the Web page satisfies all the Level A, Level AA and Level AAA Success Criteria, or a Level AAA conforming alternate version is provided.

*Note 1:* Although conformance can only be achieved at the stated levels, authors are encouraged to report (in their claim) any progress toward meeting success criteria from all levels beyond the achieved level of conformance.

*Note 2:* It is not recommended that Level AAA conformance be required as a general policy for entire sites because it is not possible to satisfy all Level AAA Success Criteria for some content.

**2. Full pages:** Conformance (and conformance level) is for full Web page(s) only, and cannot be achieved if part of a Web page is excluded.

*Note 1:* For the purpose of determining conformance, alternatives to part of a page's content are considered part of the page when the alternatives can be obtained directly from the page, e.g., a long description or an alternative presentation of a video. *Note 2:* Authors of Web pages that cannot conform due to content outside of the author's control may consider a [Statement of Partial Conformance](#).

**3. Complete processes:** When a Web page is one of a series of Web pages presenting a process (i.e., a sequence of steps that need to be completed in order to accomplish an activity), all Web pages in the process conform at the specified level or better. (Conformance is not possible at a particular level if any page in the process does not conform at that level or better.)

*Example:* An online store has a series of pages that are used to select and purchase products. All pages in the series from start to finish (checkout) conform in order for any page that is part of the process to conform.

**4. Only Accessibility-Supported Ways of Using Technologies:** Only accessibility-supported ways of using technologies are relied upon to satisfy the success criteria. Any information or functionality that is provided in a way that is not accessibility supported is also available in a way that is accessibility supported. (See [Understanding accessibility support](#).)

**5. Non-Interference:** If technologies are used in a way that is not accessibility supported, or if they are used in a non-conforming way, then they do not block the ability of users to access the rest of the page. In addition, the Web page as a whole continues to meet the conformance requirements under each of the following conditions:

1. when any technology that is not relied upon is turned on in a user agent,
2. when any technology that is not relied upon is turned off in a user agent, and
3. when any technology that is not relied upon is not supported by a user agent

In addition, the following success criteria apply to all content on the page, including content that is not otherwise relied upon to meet conformance, because failure to meet them could interfere with any use of the page:

- **1.4.2 - Audio Control,**
- **2.1.2 - No Keyboard Trap,**
- **2.3.1 - Three Flashes or Below Threshold, and**
- **2.2.2 - Pause, Stop, Hide.**

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*Note:* If a page cannot conform (for example, a conformance test page or an example page), it cannot be included in the scope of conformance or in a conformance claim.

For more information, including examples, see [Understanding Conformance Requirements](#).

## Conformance Claims (Optional)

Conformance is defined only for Web pages. However, a conformance claim may be made to cover one page, a series of pages, or multiple related Web pages.

### Required Components of a Conformance Claim

Conformance claims are **not required**. Authors can conform to WCAG 2.0 without making a claim. However, if a conformance claim is made, then the conformance claim **must** include the following information:

1. **Date** of the claim
2. **Guidelines title, version and URI** "Web Content Accessibility Guidelines 2.0 at <http://www.w3.org/TR/2008/REC-WCAG20-20081211/>"
3. **Conformance level** satisfied: (Level A, AA or AAA)
4. **A concise description of the Web pages**, such as a list of URIs for which the claim is made, including whether subdomains are included in the claim.

*Note 1:* The Web pages may be described by list or by an expression that describes all of the URIs included in the claim.

*Note 2:* Web-based products that do not have a URI prior to installation on the customer's Web site may have a statement that the product would conform when installed.

5. A list of the **Web content technologies relied upon**.

*Note:* If a conformance logo is used, it would constitute a claim and must be accompanied by the required components of a conformance claim listed above.

### Optional Components of a Conformance Claim

In addition to the required components of a conformance claim above, consider providing additional information to assist users. Recommended additional information includes:

- A list of success criteria beyond the level of conformance claimed that have been met. This information should be provided in a form that users can use, preferably machine-readable metadata.
- A list of the specific technologies that are "*used but not relied upon*."
- A list of user agents, including assistive technologies that were used to test the content.
- Information about any additional steps taken that go beyond the success criteria to enhance accessibility.
- A machine-readable metadata version of the list of specific technologies that are relied upon.
- A machine-readable metadata version of the conformance claim.

*Note 1:* Refer to [Understanding Conformance Claims](#) for more information and example conformance claims.

*Note 2:* Refer to [Understanding Metadata](#) for more information about the use of



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metadata in conformance claims.

## Statement of Partial Conformance - Third Party Content

Sometimes, Web pages are created that will later have additional content added to them. For example, an email program, a blog, an article that allows users to add comments, or applications supporting user-contributed content. Another example would be a page, such as a portal or news site, composed of content aggregated from multiple contributors, or sites that automatically insert content from other sources over time, such as when advertisements are inserted dynamically.

In these cases, it is not possible to know at the time of original posting what the uncontrolled content of the pages will be. It is important to note that the uncontrolled content can affect the accessibility of the controlled content as well. Two options are available:

1. A determination of conformance can be made based on best knowledge. If a page of this type is monitored and repaired (non-conforming content is removed or brought into conformance) within two business days, then a determination or claim of conformance can be made since, except for errors in externally contributed content which are corrected or removed when encountered, the page conforms. No conformance claim can be made if it is not possible to monitor or correct non-conforming content;

**OR**

2. A "statement of partial conformance" may be made that the page does not conform, but could conform if certain parts were removed. The form of that statement would be, "This page does not conform, but would conform to WCAG 2.0 at level X if the following parts from uncontrolled sources were removed." In addition, the following would also be true of uncontrolled content that is described in the statement of partial conformance:

- a. It is not content that is under the author's control.
- b. It is described in a way that users can identify (e.g., they cannot be described as "all parts that we do not control" unless they are clearly marked as such.)

## Statement of Partial Conformance – Language

A "statement of partial conformance due to language" may be made when the page does not conform, but would conform if accessibility support existed for (all of) the language(s) used on the page. The form of that statement would be, "This page does not conform, but would conform to WCAG 2.0 at level X if accessibility support existed for the following language(s):"

## Appendix A: Glossary

This section is normative.

### **abbreviation**

shortened form of a word, phrase, or name where the abbreviation has not become part of the language

*Note 1:* This includes initialisms and acronyms where:

1. **initialisms** are shortened forms of a name or phrase made from the initial letters of words or syllables contained in that name or phrase *Note 1:* Not defined in all languages.

*Example 1:* SNCF is a French initialism that contains the initial letters of the Société Nationale des Chemins de Fer, the French national railroad.



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*Example 2:* ESP is an initialism for extrasensory perception.

2. **acronyms** are abbreviated forms made from the initial letters or parts of other words (in a name or phrase) which may be pronounced as a word

*Example:* NOAA is an acronym made from the initial letters of the National Oceanic and Atmospheric Administration in the United States.

*Note 2:* Some companies have adopted what used to be an initialism as their company name. In these cases, the new name of the company is the letters (for example, Ecma) and the word is no longer considered an abbreviation.

### ***accessibility supported***

supported by users' assistive technologies as well as the accessibility features in browsers and other user agents To qualify as an accessibility-supported use of a Web content technology (or feature of a technology), both 1 and 2 must be satisfied for a Web content technology (or feature):

1. **The way that the Web content technology is used must be supported by users' assistive technology (AT).** This means that the way that the technology is used has been tested for interoperability with users' assistive technology in the human language(s) of the content, **AND**

2. **The Web content technology must have accessibility-supported user agents that are available to users.** This means that at least one of the following four statements is true:

a. The technology is supported natively in widely-distributed user agents that are also accessibility supported (such as HTML and CSS);

**OR**

b. The technology is supported in a widely-distributed plug-in that is also accessibility supported;

**OR**

c. The content is available in a closed environment, such as a university or corporate network, where the user agent required by the technology and used by the organization is also accessibility supported;

**OR**

d. The user agent(s) that support the technology are accessibility supported and are available for download or purchase in a way that:

- does not cost a person with a disability any more than a person without a disability **and**
- is as easy to find and obtain for a person with a disability as it is for a person without disabilities.

*Note 1:* The WCAG Working group and the W3C do not specify which or how much support by assistive technologies there must be for a particular use of a Web technology in order for it to be classified as accessibility supported. (See [Level of Assistive Technology Support Needed for "Accessibility Support"](#).)

*Note 2:* Web technologies can be used in ways that are not accessibility supported as long as they are not relied upon and the page as a whole meets the conformance requirements, including [Conformance Requirement 4: Only Accessibility-Supported Ways of Using Technologies](#) and [Conformance Requirement 5: Non-Interference](#), are met.

*Note 3:* When a Web Technology is used in a way that is "accessibility supported," it does not imply that the entire technology or all uses of the technology are supported. Most technologies, including HTML, lack support for at least one feature or use. Pages conform to WCAG only if the uses of the technology that are accessibility supported can be relied upon to meet WCAG

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requirements.

*Note 4:* When citing Web content technologies that have multiple versions, the version(s) supported should be specified.

*Note 5:* One way for authors to locate uses of a technology that are accessibility supported would be to consult compilations of uses that are documented to be accessibility supported. (See [Understanding Accessibility-Supported Web Technology Uses](#).) Authors, companies, technology vendors, or others may document accessibility-supported ways of using Web content technologies. However, all ways of using technologies in the documentation would need to meet the definition of accessibility-supported Web content technologies above.

***alternative for time-based media***

document including correctly sequenced text descriptions of time-based visual and auditory information and providing a means for achieving the outcomes of any time-based interaction

*Note:* A screenplay used to create the synchronized media content would meet this definition only if it was corrected to accurately represent the final synchronized media after editing.

***ambiguous to users in general***

the purpose cannot be determined from the link and all information of the Web page presented to the user simultaneously with the link (i.e., readers without disabilities would not know what a link would do until they activated it)

*Example:* The word guava in the following sentence "One of the notable exports is guava" is a link. The link could lead to a definition of guava, a chart listing the quantity of guava exported or a photograph of people harvesting guava. Until the link is activated, all readers are unsure and the person with a disability is not at any disadvantage.

***ASCII art***

picture created by a spatial arrangement of characters or glyphs (typically from the 95 printable characters defined by ASCII).

***assistive technology (as used in this document)***

hardware and/or software that acts as a user agent, or along with a mainstream user agent, to provide functionality to meet the requirements of users with disabilities that go beyond those offered by mainstream user agents

*Note 1:* functionality provided by assistive technology includes alternative presentations (e.g., as synthesized speech or magnified content), alternative input methods (e.g., voice), additional navigation or orientation mechanisms, and content transformations (e.g., to make tables more accessible).

*Note 2:* Assistive technologies often communicate data and messages with mainstream user agents by using and monitoring APIs.

*Note 3:* The distinction between mainstream user agents and assistive technologies is not absolute. Many mainstream user agents provide some features to assist individuals with disabilities. The basic difference is that mainstream user agents target broad and diverse audiences that usually include people with and without disabilities. Assistive technologies target narrowly defined populations of users with specific disabilities. The assistance provided by an assistive technology is more specific and appropriate to the needs of its target users. The mainstream user agent may provide important functionality to assistive technologies like retrieving Web content from program objects or parsing markup

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into identifiable bundles.

*Example: Assistive technologies that are important in the context of this document include the following:*

- screen magnifiers, and other visual reading assistants, which are used by people with visual, perceptual and physical print disabilities to change text font, size, spacing, color, synchronization with speech, etc. in order to improve the visual readability of rendered text and images;
- screen readers, which are used by people who are blind to read textual information through synthesized speech or braille;
- text-to-speech software, which is used by some people with cognitive, language, and learning disabilities to convert text into synthetic speech;
- speech recognition software, which may be used by people who have some physical disabilities;
- alternative keyboards, which are used by people with certain physical disabilities to simulate the keyboard (including alternate keyboards that use head pointers, single switches, sip/puff and other special input devices.);
- alternative pointing devices, which are used by people with certain physical disabilities to simulate mouse pointing and button activations.

### **audio**

the technology of sound reproduction

Note: Audio can be created synthetically (including speech synthesis), recorded from real world sounds, or both.

### **audio description**

narration added to the soundtrack to describe important visual details that cannot be understood from the main soundtrack alone

*Note 1:* Audio description of video provides information about actions, characters, scene changes, on-screen text, and other visual content.

*Note 2:* In standard audio description, narration is added during existing pauses in dialogue. (See also extended audio description.)

*Note 3:* Where all of the video information is already provided in existing audio, no additional audio description is necessary.

*Note 4:* Also called "video description" and "descriptive narration."

### **audio-only**

a time-based presentation that contains only audio (no video and no interaction)

### **blinking**

switch back and forth between two visual states in a way that is meant to draw attention

*Note:* See also flash. It is possible for something to be large enough and blink brightly enough at the right frequency to be also classified as a flash.

### **blocks of text**

more than one sentence of text

### **CAPTCHA**

initialism for "Completely Automated Public Turing test to tell Computers and Humans Apart"

*Note 1:* CAPTCHA tests often involve asking the user to type in text that is displayed in an obscured image or audio file.

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*Note 2:* A Turing test is any system of tests designed to differentiate a human from a computer. It is named after famed computer scientist Alan Turing. The term was coined by researchers at Carnegie Mellon University. [\[CAPTCHA\]](#)

### ***captions***

synchronized visual and/or text alternative for both speech and non-speech audio information needed to understand the media content

*Note 1:* Captions are similar to dialogue-only subtitles except captions convey not only the content of spoken dialogue, but also equivalents for non-dialogue audio information needed to understand the program content, including sound effects, music, laughter, speaker identification and location.

*Note 2:* Closed Captions are equivalents that can be turned on and off with some players.

*Note 3:* Open Captions are any captions that cannot be turned off. For example, if the captions are visual equivalent images of text embedded in video.

*Note 4:* Captions should not obscure or obstruct relevant information in the video.

*Note 5:* In some countries, captions are called subtitles.

*Note 6:* Audio descriptions can be, but do not need to be, captioned since they are descriptions of information that is already presented visually.

### ***changes of context***

major changes in the content of the Web page that, if made without user awareness, can disorient users who are not able to view the entire page simultaneously Changes in context include changes of:

1. user agent;
2. viewport;
3. focus;
4. content that changes the meaning of the Web page.

*Note:* A change of content is not always a change of context. Changes in content, such as an expanding outline, dynamic menu, or a tab control do not necessarily change the context, unless they also change one of the above (e.g., focus).

*Example:* Opening a new window, moving focus to a different component, going to a new page (including anything that would look to a user as if they had moved to a new page) or significantly re-arranging the content of a page are examples of changes of context.

### ***conformance***

satisfying all the requirements of a given standard, guideline or specification

### ***conforming alternate version***

version that

1. conforms at the designated level, and
2. provides all of the same information and functionality in the same human language, and
3. is as up to date as the non-conforming content, and
4. for which at least one of the following is true:
  - a. the conforming version can be reached from the non-conforming page via an accessibility-supported mechanism, or
  - b. the non-conforming version can only be reached from the conforming version, or
  - c. the non-conforming version can only be reached from a conforming page that also provides a mechanism to reach the conforming version

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*Note 1:* In this definition, "can only be reached" means that there is some mechanism, such as a conditional redirect, that prevents a user from "reaching" (loading) the non-conforming page unless the user had just come from the conforming version.

*Note 2:* The alternate version does not need to be matched page for page with the original (e.g., the conforming alternate version may consist of multiple pages).

*Note 3:* If multiple language versions are available, then conforming alternate versions are required for each language offered.

*Note 4:* Alternate versions may be provided to accommodate different technology environments or user groups. Each version should be as conformant as possible. One version would need to be fully conformant in order to meet [conformance requirement 1](#).

*Note 5:* The conforming alternative version does not need to reside within the scope of conformance, or even on the same Web site, as long as it is as freely available as the non-conforming version.

*Note 6:* Alternate versions should not be confused with supplementary content, which support the original page and enhance comprehension.

*Note 7:* Setting user preferences within the content to produce a conforming version is an acceptable mechanism for reaching another version as long as the method used to set the preferences is accessibility supported.

See [Understanding Conforming Alternate Versions content \(Web content\)](#)

***content (Web content)***

information and sensory experience to be communicated to the user by means of a user agent, including code or markup that defines the content's structure, presentation, and interactions.

***context-sensitive help***

help text that provides information related to the function currently being performed

Note: Clear labels can act as context-sensitive help.

***contrast ratio***

$(L1 + 0.05) / (L2 + 0.05)$ , where L1 is the relative luminance of the lighter of the colors, and L2 is the relative luminance of the darker of the colors. Note 1: Contrast ratios can range from 1 to 21 (commonly written 1:1 to 21:1).

*Note 2:* Because authors do not have control over user settings as to how text is rendered (for example font smoothing or anti-aliasing), the contrast ratio for text can be evaluated with anti-aliasing turned off.

*Note 3:* For the purpose of Success Criteria 1.4.3 and 1.4.6, contrast is measured with respect to the specified background over which the text is rendered in normal usage. If no background color is specified, then white is assumed.

*Note 4:* Background color is the specified color of content over which the text is to be rendered in normal usage. It is a failure if no background color is specified when the text color is specified, because the user's default background color is unknown and cannot be evaluated for sufficient contrast. For the same reason, it is a failure if no text color is specified when a background color is specified.

*Note 5:* When there is a border around the letter, the border can add contrast and would be used in calculating the contrast between the letter and its background. A narrow border around the letter would be used as the letter. A wide border around the letter that fills in the inner details of the letters acts as a halo and would be considered background.

*Note 6:* WCAG conformance should be evaluated for color pairs specified in the

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content that an author would expect to appear adjacent in typical presentation. Authors need not consider unusual presentations, such as color changes made by the user agent, except where caused by authors' code.

**correct reading sequence**

any sequence where words and paragraphs are presented in an order that does not change the meaning of the content.

**emergency**

a sudden, unexpected situation or occurrence that requires immediate action to preserve health, safety, or property.

**essential**

if removed, would fundamentally change the information or functionality of the content, **and** information and functionality cannot be achieved in another way that would conform.

**extended audio description**

audio description that is added to an audiovisual presentation by pausing the video so that there is time to add additional description

*Note:* This technique is only used when the sense of the video would be lost without the additional audio description and the pauses between dialogue/narration are too short.

**flash**

a pair of opposing changes in relative luminance that can cause seizures in some people if it is large enough and in the right frequency range

*Note 1:* See general flash and red flash thresholds for information about types of flash that are not allowed.

*Note 2:* See also blinking. **Functionality** processes and outcomes achievable through user action

**general flash and red flash thresholds**

a flash or rapidly changing image sequence is below the threshold (i.e., content **passes**) if any of the following are true:

1. there are no more than three **general flashes** and / or no more than three **red flashes** within any one-second period; or
2. the combined area of flashes occurring concurrently occupies no more than a total of .006 steradians within any 10 degree visual field on the screen (25% of any 10 degree visual field on the screen) at typical viewing distance where:
  - A **general flash** is defined as a pair of opposing changes in relative luminance of 10% or more of the maximum relative luminance where the relative luminance of the darker image is below 0.80; and where "a pair of opposing changes" is an increase followed by a decrease, or a decrease followed by an increase, and
  - A **red flash** is defined as any pair of opposing transitions involving a saturated red.

*Exception:* Flashing that is a fine, balanced, pattern such as white noise or an alternating checkerboard pattern with "squares" smaller than 0.1 degree (of visual field at typical viewing distance) on a side does not violate the thresholds.

*Note 1:* For general software or Web content, using a 341 x 256 pixel rectangle anywhere on the displayed screen area when the content is viewed at 1024 x 768 pixels will provide a good estimate of a 10 degree visual field for standard screen sizes and viewing distances (e.g., 15-17 inch screen at 22-26 inches). (Higher

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resolutions displays showing the same rendering of the content yield smaller and safer images so it is lower resolutions that are used to define the thresholds.)

*Note 2:* A transition is the change in relative luminance (or relative luminance/color for red flashing) between adjacent peaks and valleys in a plot of relative luminance (or relative luminance/color for red flashing) measurement against time. A flash consists of two opposing transitions.

*Note 3:* The current working definition in the field for "**pair of opposing transitions involving a saturated red**" is where, for either or both states involved in each transition,  $R/(R + G + B) \geq 0.8$ , and the change in the value of  $(R - G - B) \times 320$  is  $> 20$  (negative values of  $(R - G - B) \times 320$  are set to zero) for both transitions. R, G, B values range from 0-1 as specified in "relative luminance" definition. [\[HARDING-BINNIE\]](#)

*Note 4:* Tools are available that will carry out analysis from video screen capture. However, no tool is necessary to evaluate for this condition if flashing is less than or equal to 3 flashes in any one second. Content automatically passes (see #1 and #2 above).

### **human language**

language that is spoken, written or signed (through visual or tactile means) to communicate with humans

*Note:* See also sign language.

### **idiom**

phrase whose meaning cannot be deduced from the meaning of the individual words and the specific words cannot be changed without losing the meaning

*Note:* idioms cannot be translated directly, word for word, without losing their (cultural or language-dependent) meaning.

*Example 1:* In English, "spilling the beans" means "revealing a secret." However, "knocking over the beans" or "spilling the vegetables" does not mean the same thing.

*Example 2:* In Japanese, the phrase “さじを投げる” literally translates into "he throws a spoon," but it means that there is nothing he can do and finally he gives up.

*Example 3:* In Dutch, "Hij ging met de kippen op stok" literally translates into "He went to roost with the chickens," but it means that he went to bed early.

### **image of text**

text that has been rendered in a non-text form (e.g., an image) in order to achieve a particular visual effect

*Note:* This does not include text that is part of a picture that contains significant other visual content.

*Example:* A person's name on a nametag in a photograph. **Informative** for information purposes and not required for conformance *Note:* Content required for conformance is referred to as "normative."

### **input error**

information provided by the user that is not accepted *Note:* This includes:

1. Information that is required by the Web page but omitted by the user
2. Information that is provided by the user but that falls outside the required data format or values

### **jargon**

words used in a particular way by people in a particular field

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Example: The word StickyKeys is jargon from the field of assistive technology/accessibility.

### **keyboard interface**

interface used by software to obtain keystroke input

*Note 1:* A keyboard interface allows users to provide keystroke input to programs even if the native technology does not contain a keyboard.

*Example:* A touchscreen PDA has a keyboard interface built into its operating system as well as a connector for external keyboards. Applications on the PDA can use the interface to obtain keyboard input either from an external keyboard or from other applications that provide simulated keyboard output, such as handwriting interpreters or speech-to-text applications with "keyboard emulation" functionality.

*Note 2:* Operation of the application (or parts of the application) through a keyboard-operated mouse emulator, such as MouseKeys, does not qualify as operation through a keyboard interface because operation of the program is through its pointing device interface, not through its keyboard interface.

### **label**

text or other component with a text alternative that is presented to a user to identify a component within Web content

*Note 1:* A label is presented to all users whereas the name may be hidden and only exposed by assistive technology. In many (but not all) cases the name and the label are the same.

*Note 2:* The term label is not limited to the label element in HTML.

### **large scale (text)**

with at least 18 point or 14 point bold or font size that would yield equivalent size for Chinese, Japanese and Korean (CJK) fonts

*Note 1:* Fonts with extraordinarily thin strokes or unusual features and characteristics that reduce the familiarity of their letter forms are harder to read, especially at lower contrast levels.

*Note 2:* Font size is the size when the content is delivered. It does not include resizing that may be done by a user.

*Note 3:* The actual size of the character that a user sees is dependent both on the author-defined size and the user's display or user-agent settings. For many mainstream body text fonts, 14 and 18 point is roughly equivalent to 1.2 and 1.5 em or to 120% or 150% of the default size for body text (assuming that the body font is 100%), but authors would need to check this for the particular fonts in use. When fonts are defined in relative units, the actual point size is calculated by the user agent for display. The point size should be obtained from the user agent, or calculated based on font metrics as the user agent does, when evaluating this success criterion. Users who have low vision would be responsible for choosing appropriate settings.

*Note 4:* When using text without specifying the font size, the smallest font size used on major browsers for unspecified text would be a reasonable size to assume for the font. If a level 1 heading is rendered in 14pt bold or higher on major browsers, then it would be reasonable to assume it is large text. Relative scaling can be calculated from the default sizes in a similar fashion.

*Note 5:* The 18 and 14 point sizes for roman texts are taken from the minimum size for large print (14pt) and the larger standard font size (18pt). For other fonts such as CJK languages, the "equivalent" sizes would be the minimum large print



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size used for those languages and the next larger standard large print size.

**legal commitments**

transactions where the person incurs a legally binding obligation or benefit

Example: A marriage license, a stock trade (financial and legal), a will, a loan, adoption, signing up for the army, a contract of any type, etc.

**link purpose**

nature of the result obtained by activating a hyperlink

**live**

information captured from a real-world event and transmitted to the receiver with no more than a broadcast delay

*Note 1:* A broadcast delay is a short (usually automated) delay, for example used in order to give the broadcaster time to queue or censor the audio (or video) feed, but not sufficient to allow significant editing.

*Note 2:* If information is completely computer generated, it is not live.

**lower secondary education level**

the two or three year period of education that begins after completion of six years of school and ends nine years after the beginning of primary education

*Note:* This definition is based on the International Standard Classification of Education [UNESCO].

**mechanism**

process or technique for achieving a result

*Note 1:* The mechanism may be explicitly provided in the content, or may be relied upon to be provided by either the platform or by user agents, including assistive technologies.

*Note 2:* The mechanism needs to meet all success criteria for the conformance level claimed.

**media alternative for text**

media that presents no more information than is already presented in text (directly or via text alternatives)

*Note:* A media alternative for text is provided for those who benefit from alternate representations of text. Media alternatives for text may be audio-only, video-only (including sign-language video), or audio-video.

**name**

text by which software can identify a component within Web content to the user

*Note 1:* The name may be hidden and only exposed by assistive technology, whereas a label is presented to all users. In many (but not all) cases, the label and the name are the same.

*Note 2:* This is unrelated to the name attribute in HTML.

**navigated sequentially**

navigated in the order defined for advancing focus (from one element to the next) using a keyboard interface

**non-text content**

any content that is not a sequence of characters that can be programmatically determined or where the sequence is not expressing something in human language

*Note:* This includes ASCII Art (which is a pattern of characters), emoticons, leetspeak (which uses character substitution), and images representing text

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**normative**

required for conformance *Note 1:* One may conform in a variety of well-defined ways to this document.

*Note 2:* Content identified as "informative" or "non-normative" is never required for conformance.

**on a full-screen window**

on the most common sized desktop/laptop display with the viewport maximized

*Note:* Since people generally keep their computers for several years, it is best not to rely on the latest desktop/laptop display resolutions but to consider the common desktop/laptop display resolutions over the course of several years when making this evaluation.

**paused**

stopped by user request and not resumed until requested by user

**prerecorded**

information that is not live

**presentation**

rendering of the content in a form to be perceived by users

**primary education level**

six year time period that begins between the ages of five and seven, possibly without any previous education

*Note:* This definition is based on the International Standard Classification of Education [UNESCO].

**process**

series of user actions where each action is required in order to complete an activity

*Example 1:* Successful use of a series of Web pages on a shopping site requires users to view alternative products, prices and offers, select products, submit an order, provide shipping information and provide payment information.

*Example 2:* An account registration page requires successful completion of a Turing test before the registration form can be accessed.

**programmatically determined (programmatically determinable)**

determined by software from author-supplied data provided in a way that different user agents, including assistive technologies, can extract and present this information to users in different modalities

*Example 1:* Determined in a markup language from elements and attributes that are accessed directly by commonly available assistive technology.

*Example 2:* Determined from technology-specific data structures in a non-markup language and exposed to assistive technology via an accessibility API that is supported by commonly available assistive technology.

**programmatically determined link context**

additional information that can be programmatically determined from relationships with a link, combined with the link text, and presented to users in different modalities

*Example:* In HTML, information that is programmatically determinable from a link in English includes text that is in the same paragraph, list, or table cell as the link or in a table header cell that is associated with the table cell that contains the link.

*Note:* Since screen readers interpret punctuation, they can also provide the context from the current sentence, when the focus is on a link in that sentence.

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**programmatically set**

set by software using methods that are supported by user agents, including assistive technologies

**pure decoration**

serving only an aesthetic purpose, providing no information, and having no functionality

*Note:* Text is only purely decorative if the words can be rearranged or substituted without changing their purpose.

*Example:* The cover page of a dictionary has random words in very light text in the background.

**real-time event**

event that a) occurs at the same time as the viewing and b) is not completely generated by the content

*Example 1:* A Webcast of a live performance (occurs at the same time as the viewing and is not prerecorded).

*Example 2:* An on-line auction with people bidding (occurs at the same time as the viewing).

*Example 3:* Live humans interacting in a virtual world using avatars (is not completely generated by the content and occurs at the same time as the viewing).

**relationships**

meaningful associations between distinct pieces of content

**relative luminance**

the relative brightness of any point in a colorspace, normalized to 0 for darkest black and

1 for lightest white

*Note 1:* For the sRGB colorspace, the relative luminance of a color is defined as  $L = 0.2126 * R + 0.7152 * G + 0.0722 * B$  where **R**, **G** and **B** are defined as:

- if  $R_{sRGB} \leq 0.03928$  then  $R = R_{sRGB}/12.92$  else  $R = ((R_{sRGB} + 0.055)/1.055) ^{2.4}$
- if  $G_{sRGB} \leq 0.03928$  then  $G = G_{sRGB}/12.92$  else  $G = ((G_{sRGB} + 0.055)/1.055) ^{2.4}$
- if  $B_{sRGB} \leq 0.03928$  then  $B = B_{sRGB}/12.92$  else  $B = ((B_{sRGB} + 0.055)/1.055) ^{2.4}$

and  $R_{sRGB}$ ,  $G_{sRGB}$ , and  $B_{sRGB}$  are defined as:

- $R_{sRGB} = R_{8bit}/255$
- $G_{sRGB} = G_{8bit}/255$
- $B_{sRGB} = B_{8bit}/255$

The "^" character is the exponentiation operator. (Formula taken from [\[sRGB\]](#) and [\[IEC-4WD\]](#)).

*Note 2:* Almost all systems used today to view Web content assume sRGB encoding. Unless it is known that another color space will be used to process and display the content, authors should evaluate using sRGB colorspace. If using other color spaces, see [Understanding Success Criterion 1.4.3](#).

*Note 3:* If dithering occurs after delivery, then the source color value is used. For colors that are dithered at the source, the average values of the colors that are dithered should be used (average R, average G, and average B).

*Note 4:* Tools are available that automatically do the calculations when testing contrast and flash.

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*Note 5:* A [MathML version of the relative luminance definition](#) is available.

***relied upon (technologies that are)***

the content would not conform if that technology is turned off or is not supported

***role***

text or number by which software can identify the function of a component within Web content

*Example:* A number that indicates whether an image functions as a hyperlink, command button, or check box.

***same functionality***

same result when used

*Example:* A submit "search" button on one Web page and a "find" button on another Web page may both have a field to enter a term and list topics in the Web site related to the term submitted. In this case, they would have the same functionality but would not be labeled consistently.

***same relative order***

same position relative to other items

*Note:* Items are considered to be in the same relative order even if other items are inserted or removed from the original order. For example, expanding navigation menus may insert an additional level of detail or a secondary navigation section may be inserted into the reading order.

***satisfies a success criterion***

the success criterion does not evaluate to 'false' when applied to the page

***section***

A self-contained portion of written content that deals with one or more related topics or thoughts

*Note:* A section may consist of one or more paragraphs and include graphics, tables, lists and sub-sections.

***set of Web pages***

collection of Web pages that share a common purpose and that are created by the same author, group or organization

*Note:* Different language versions would be considered different sets of Web pages.

***sign language***

a language using combinations of movements of the hands and arms, facial expressions, or body positions to convey meaning

***sign language interpretation***

translation of one language, generally a spoken language, into a sign language

*Note:* True sign languages are independent languages that are unrelated to the spoken language(s) of the same country or region.

***specific sensory experience***

a sensory experience that is not purely decorative and does not primarily convey important information or perform a function

*Example:* Examples include a performance of a flute solo, works of visual art etc.

***structure***

1. The way the parts of a Web page are organized in relation to each other; and

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## 2. The way a collection of Web pages is organized

### **supplemental content**

additional content that illustrates or clarifies the primary content *Example 1:* An audio version of a Web page.

*Example 2:* An illustration of a complex process. *Example 3:* A paragraph summarizing the major outcomes and recommendations made in a research study.

### **synchronized media**

audio or video synchronized with another format for presenting information and/or with time-based interactive components, unless the media is a media alternative for text that is clearly labeled as such **technology (Web content)**

mechanism for encoding instructions to be rendered, played or executed by user agents

*Note 1:* As used in these guidelines "Web Technology" and the word "technology" (when used alone) both refer to Web Content Technologies.

*Note 2:* Web content technologies may include markup languages, data formats, or programming languages that authors may use alone or in combination to create end- user experiences that range from static Web pages to synchronized media presentations to dynamic Web applications.

*Example:* Some common examples of Web content technologies include HTML, CSS, SVG, PNG, PDF, Flash, and JavaScript.

### **text**

sequence of characters that can be programmatically determined, where the sequence is expressing something in human language

### **text alternative**

text that is programmatically associated with non-text content or referred to from text that is programmatically associated with non-text content. Programmatically associated text is text whose location can be programmatically determined from the non-text content.

*Example:* An image of a chart is described in text in the paragraph after the chart. The short text alternative for the chart indicates that a description follows.

*Note:* Refer to [Understanding Text Alternatives](#) for more information.

### **used in an unusual or restricted way**

words used in such a way that requires users to know exactly which definition to apply in order to understand the content correctly

*Example:* The term "gig" means something different if it occurs in a discussion of music concerts than it does in article about computer hard drive space, but the appropriate definition can be determined from context. By contrast, the word "text" is used in a very specific way in WCAG 2.0, so a definition is supplied in the glossary.

### **user agent**

any software that retrieves and presents Web content for users

*Example:* Web browsers, media players, plug-ins, and other programs — including assistive technologies — that help in retrieving, rendering, and interacting with Web content.

### **user-controllable**

data that is intended to be accessed by users

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*Note:* This does not refer to such things as Internet logs and search engine monitoring data.

*Example:* Name and address fields for a user's account.

### **user interface component**

a part of the content that is perceived by users as a single control for a distinct function

*Note 1:* Multiple user interface components may be implemented as a single programmatic element. Components here is not tied to programming techniques, but rather to what the user perceives as separate controls.

*Note 2:* User interface components include form elements and links as well as components generated by scripts.

*Example:* An applet has a "control" that can be used to move through content by line or page or random access. Since each of these would need to have a name and be settable independently, they would each be a "user interface component."

### **video**

the technology of moving or sequenced pictures or images *Note:* Video can be made up of animated or photographic images, or both.

### **video-only**

a time-based presentation that contains only video (no audio and no interaction)

### **viewport**

object in which the user agent presents content

*Note 1:* The user agent presents content through one or more viewports. Viewports include windows, frames, loudspeakers, and virtual magnifying glasses. A viewport may contain another viewport (e.g., nested frames). Interface components created by the user agent such as prompts, menus, and alerts are not viewports.

*Note 2:* This definition is based on [User Agent Accessibility Guidelines 1.0 Glossary](#). **visually customized** the font, size, color, and background can be set

### **Web page**

a non-embedded resource obtained from a single URI using HTTP plus any other resources that are used in the rendering or intended to be rendered together with it by a user agent

*Note 1:* Although any "other resources" would be rendered together with the primary resource, they would not necessarily be rendered simultaneously with each other.

*Note 2:* For the purposes of conformance with these guidelines, a resource must be "non-embedded" within the scope of conformance to be considered a Web page.

*Example 1:* A Web resource including all embedded images and media.

*Example 2:* A Web mail program built using Asynchronous JavaScript and XML (AJAX). The program lives entirely at <http://example.com/mail>, but includes an inbox, a contacts area and a calendar. Links or buttons are provided that cause the inbox, contacts, or calendar to display, but do not change the URI of the page as a whole.

*Example 3:* A customizable portal site, where users can choose content to display from a set of different content modules.

*Example 4:* When you enter "<http://shopping.example.com/>" in your browser, you enter a movie-like interactive shopping environment where you visually move

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around in a store dragging products off of the shelves around you and into a visual shopping cart in front of you. Clicking on a product causes it to be demonstrated with a specification sheet floating alongside. This might be a single-page Web site or just one page within a Web site.

## Appendix B: Acknowledgments

This section is informative.

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Additional information about participation in the Web Content Accessibility Guidelines Working Group (WCAG WG) can be found on the [Working Group home page](#).

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