W3C

Techniques for Authoring Tool Accessibility

W3C WD 3 February 2000

This version:
http://www.w3.org/WAI/AU/WD-ATAG10-TECHS-20000308
(plain text, HTML gzip tar archive, HTML zip archive, PostScript, PDF)
Latest version:
http://www.w3.org/WAI/AU/ATAG10-TECHS
Previous version:
http://www.w3.org/TR/2000/NOTE-ATAG10-TECHS-20000203

Editors:
Jutta Treviranus - ATRC, University of Toronto
Charles McCathieNevile - W3C
Ian Jacobs - W3C
Jan Richards - University of Toronto

Abstract

This document provides information to authoring tool developers who wish to satisfy the checkpoints of "Authoring Tool Accessibility Guidelines 1.0" [ATAG10] . It includes suggested techniques, sample strategies in deployed tools, and references to other accessibility resources (such as platform-specific software accessibility guidelines) that provide additional information on how a tool may satisfy each checkpoint.

This document is part of a series of accessibility documents published by the W3C Web Accessibility Initiative (WAI).

Status of this document

This section describes the status of this document at the time of its publication. Other documents may supersede this document. The latest status of this document series is maintained at the W3C.

This document is a draft update to a W3C Note, published as an informative appendix to "Authoring Tool Accessibility Guidelines 1.0". The Working Group expects to update this document in response to queries raised by implementors of the Guidelines, for example, to cover new technologies. Suggestions for additional techniques are welcome.

This document is published for review by the Authoring Tool Accessibility Guidelines Working Group (AUWG) and other interested parties, and has not been endorsed by the Working Group, the W3C or any of the W3C Membership.

For further information about Working Group decisions, please consult the minutes of AUWG Meetings.

This document has been produced by the Authoring Tool Accessibility Guidelines Working Group (AUWG) as part of the Web Accessibility Initiative (WAI). The goals of the Working Group are discussed in the AUWG charter.

Please send general comments about this document to the public mailing list: w3c-wai-au@w3.org (public archives).

A list of current W3C Recommendations and other technical documents including Working Drafts and Notes can be found at http://www.w3.org/TR.

Table of Contents

1 Introduction

The "Authoring Tool Accessibility Guidelines 1.0" [ATAG10] has two goals: to assist developers in designing authoring tools that produce accessible Web content and to assist developers in creating an accessible authoring interface. The present "Techniques Document" suggests to developers some strategies for meeting those goals.

Implementation of techniques for some of these guidelines requires familiarity with the Web Content Accessibility Guidelines (WCAG) 1.0 [WCAG10] . In addition, readers are strongly encouraged to become familiar with the "Techniques for Web Content Accessibility Guidelines 1.0" [WCAG10-TECHS] and "Techniques for User Agent Accessibility Guidelines 1.0" [UAAG10-TECHS] .

Note: The techniques in this document are merely suggestions; they are not required for conformance to "Authoring Tool Accessibility Guidelines 1.0". These techniques are not necessarily the only way of satisfying the checkpoint, nor are they necessarily a definitive set of requirements for satisfying a checkpoint.

1.1 How the Techniques are organized

This document has the same structure as the "Authoring Tool Accessibility Guidelines 1.0" [ATAG10] : seven guidelines, each of which includes at least one checkpoint. Information about checkpoint priorities is found in the "Authoring Tool Accessibility Guidelines 1.0".

Unlike "Authoring Tool Accessibility Guidelines 1.0", the current document includes a list of techniques after each checkpoint. Techniques may be suggested strategies, references to other accessibility resources (noted "Reference"), or examples of how deployed tools satisfy the checkpoint (noted "Sample").

For some guidelines there are techniques or information that are relevant to the entire guideline. These are provided at the end of the section for the relevant guideline.

Some of the sample techniques describe how Amaya satisfies the checkpoints. Amaya [AMAYA] is both an HTML authoring tool and a browser. Amaya's default editing view is WYSIWYG-style. The Amaya techniques are also available as a single "sample implementation" document [AMAYA-SAMPLE] .

2 Guidelines

Guideline 1. Support accessible authoring practices.

If the tool automatically generates markup, many authors will be unaware of the accessibility status of the final content unless they expend extra effort to review it and make appropriate corrections by hand. Since many authors are unfamiliar with accessibility, authoring tools are responsible for automatically generating accessible markup, and where appropriate, for guiding the author in producing accessible content.

Many applications feature the ability to convert documents from other formats (e.g., Rich Text Format) into a markup format specifically intended for the Web such as HTML. Markup changes may also be made to facilitate efficient editing and manipulation. It is essential that these processes do not introduce inaccessible markup or remove accessibility content, particularly when a tool hides the markup changes from the author's view.

Checkpoints:

1.1 Ensure that the author can produce accessible content in the markup language(s) supported by the tool. [Priority 1] (Checkpoint 1.1)

- Provide options for accessibility information to be included whenever an object is added to a document (e.g., a text equivalent for an image). Refer also to checkpoint 3.1.
- Allow direct source editing (but note also the requirements of checkpoint 1.2 and checkpoint 5.1)
- Most image formats, including PNG, SVG, WebCGM, JPEG, and GIF allow the inclusion of text content. Where it is available in the format, this feature should be used by authoring tools.
- Many formats for audio or video allow authors to include equivalent alternatives.
- An audio/video editing suite can use SMIL to synchronize audio, video, descriptive signing and text tracks.
- **Reference:** Web Content Accessibility Guidelines 1.0 [WCAG10] and Techniques for Web Content Accessibility Guidelines 1.0 [WCAG10-TECHS]
- **Reference:** The Web Accessibility Initiative has published a number of documents on the accessibility features of different W3C specifications:
    - Accessibility Features of CSS [CSS2-ACCESS]
    - Accessibility Features of SMIL [SMIL-ACCESS]
    - HTML 4.0 Accessibility Improvements [HTML4-ACCESS] .
    - Accessibility of Scalable Vector Graphics [SVG-ACCESS]

In each case the specifications themselves also provide information.

- **Sample:** Amaya implements all of the accessibility features of HTML. The CSS cascade order, an accessibility feature of CSS2, has not yet been completely implemented in Amaya.

1.2 Ensure that the tool preserves all accessibility information during authoring, transformations , and conversions . [Priority 1] (Checkpoint 1.2)

- When transforming a table to a list or list of lists, ensure that table headings are transformed into headings and that summary or caption information is retained as rendered content. This transformation may not be reversible.
- Even when a document's graphical layout has been rearranged, ensure that the document makes sense when rendered serially. For example, prompt the author to confirm linearized reading order after the graphical layout has changed. Desktop publishing software often has such a feature.
- When importing images with associated descriptions to an HTML document make the descriptions available through appropriate markup. For instance, in HTML use `"longdesc"` or `"alt"`.
- When converting from a word-processor format to HTML, ensure that headings and list items are transformed into appropriate headings of the appropriate level, and list items in the appropriate type of list (rather than as plain text with font formatting)
- Do not transform text into images - use style sheets for presentation control, or an XML application such as Scalable Vector Graphics [SVG] that keeps the text as text. If this is not possible, ensure that the text that is converted is available as equivalent text for the image.
- Ensure that the tool recognizes and preserves elements that are defined in the relevant specification(s) even if it is unable to render them in a publishing view or preview mode. This is relevant for WYSIWYG page authoring tools, tools that handle image formats which allow the incorporation of equivalent text or data, and tools for multimedia and data-processing.
- When converting linked elements such as footnotes or endnotes either provide them as inline content or maintain two-way linking. In HTML, this should be hypertext links rather than plain-text references.
- **Sample:** The predefined transformations shipped with Amaya preserve all element content. The transformation language allows the preservation of attribute values, but this is not done by all the supplied transformations.

1.3 Ensure that when the tool automatically generates markup it conforms to the W3C's Web Content Accessibility Guidelines 1.0 [WCAG10] . [Relative Priority] (Checkpoint 1.3)

- Use consistent document structures. For a tool that does site-wide management, provide consistent navigation systems and document structures.
- Include markup that provides equivalent alternatives for media-dependent elements or content.
- Do not use structural markup for presentation effects, or presentation

markup for known structures. For example, use list markup of an appropriate type rather than creating multiple line paragraphs and beginning each line with an image of a bullet. Do not use list markup for an indentation effect.

- Do not publish Web content in markup languages that do not allow for equivalent alternative information to be included for media-specific presentations (such as images or video, sound, etc).
- New markup languages are constantly being developed, and in many cases offer improvements to the structure and utility of Web content. In implementing a new or extended markup language, it is important to ensure that a tool does not remove access to information that had been inherent in the base markup language.

  The same can apply to a format that simplifies an existing format. For example, producing a modified HTML DTD that did not include the `"alt"` attribute for the `IMG` element, or effectively working to such a DTD by not implementing a means to include the attribute, compromises the accessibility of any included `IMG` elements.
- **Reference:** The Web Accessibility Initiative's Protocols and Formats group have a draft set of notes about creating accessible markup languages [XMLGL] .
- **Sample:** Amaya generates markup that conforms to level-A, and allows the author to generate markup that is triple-A through the user interface.

1.4 Ensure that templates provided by the tool conform to the Web Content Accessibility Guidelines 1.0 [WCAG10] . [Relative Priority] (Checkpoint 1.4)

- Produce accessible representations for site maps generated by the authoring tool.
- Provide equivalent alternatives for all non-text content (images, audio, etc).
- Use consistent navigation mechanisms.
- Ensure that event-handlers for scripts are device-independent.
- Ensure that color schemes provide sufficient contrast for people or technology with poor color separation.
- Ensure that the natural language of the template is identified.
- Provide navigation bars.
- Provide keyboard shortcuts for important links, etc.
- **Sample:** Amaya has templates, which have not yet been checked for conformance to WCAG 1.0 [WCAG10] .
- Some sample templates are available: (Note that these samples are still subject to review, and may require changes.
  Sample set one includes
    - Main page template.
    - News and events page template.
    - Stylesheet.

Guideline 2. Generate standard markup.

Conformance with standards promotes interoperability and accessibility by making it easier to create specialized user agents that address the needs of users with disabilities. In particular, many assistive technologies used with browsers and multimedia players are only able to provide access to Web documents that use valid markup. Therefore, valid markup is an essential aspect of authoring tool accessibility.

Where applicable use W3C Recommendations, which have been reviewed to ensure accessibility and interoperability. If there are no applicable W3C Recommendations, use a published standard that enables accessibility.

Checkpoints:

2.1 Use the latest versions of W3C Recommendations when they are available and appropriate for a task. [Priority 2] (Checkpoint 2.1)

W3C specifications have undergone review specifically to ensure that they do not compromise accessibility, and where possible, they enhance it.

- When creating documents or markup languages, make full use of W3C Recommendations . For example, when creating mathematical content for the Web use MathML [MATHML] rather than another markup language. Use applicable HTML 4 [HTML4] structures.
- Specifications that become W3C Recommendations after an authoring tool's development cycles permit input are not considered "available" in time.
- Ensure that the tool recognizes and preserves elements that are defined in the relevant specification(s) even if it is unable to render them. This is particularly important for WYSIWYG editing tools.
- **Sample:** Amaya supports HTML 4 [HTML4] , XHTML 1.0 [XHTML10] , and most of CSS1 [CSS1] . It provides partial support for MathML [MATHML] and some experimental support for Scalable Vector Graphics [SVG] .

2.2 Ensure that the tool automatically generates valid markup. [Priority 1] (Checkpoint 2.2)

This is necessary for user agents to be able to render Web content in a manner appropriate to a particular user's needs.

- Produce valid HTML/XML. Refer to [HTML-XML-VALIDATOR] .
- Publish proprietary language specifications or DTDs on the Web, to allow documents to be validated.
- Use namespaces and schemas to make documents that can be automatically transformed to a known markup language.
- **Sample:** Amaya implements each language according to the published specifications.

2.3 If markup produced by the tool does not conform to W3C specifications, inform the author. [Priority 3] (Checkpoint 2.3)

- Invalid markup can be highlighted through the use of style sheets. Refer also to checkpoint 4.1.

- A tool that provides a Web editing mode and a non-Web editing mode can change modes when invalid markup is introduced. Refer also to checkpoint 4.1.
- **Sample:** If Amaya imports or generates markup that does not conform to W3C specifications it is highlighted in the structure view. This occurs when Amaya tries to repair invalid markup and cannot successfully do so.

Guideline 3. Support the creation of accessible content.

Well-structured information and equivalent alternative information are cornerstones of accessible design, allowing information to be presented in a way most appropriate for the needs of the user without constraining the creativity of the author. Yet producing equivalent information, such as text alternatives for images and auditory descriptions of video, can be one of the most challenging aspects of Web design, and authoring tool developers should attempt to facilitate and automate the mechanics of this process. For example, prompting authors to include equivalent alternative information such as text equivalents , captions , and auditory descriptions at appropriate times can greatly ease the burden for authors. Where such information can be mechanically determined and offered as a choice for the author (e.g., the function of icons in an automatically-generated navigation bar, or expansion of acronyms from a dictionary), the tool can assist the author. At the same time, the tool can reinforce the need for such information and the author's role in ensuring that it is used appropriately in each instance.

Checkpoints:

3.1 Prompt the author to provide equivalent alternative information (e.g., captions , auditory descriptions , and collated text transcripts for video). [Relative Priority] (Checkpoint 3.1)

Note: Some checkpoints in the Web Content Accessibility Guidelines 1.0 [WCAG10] may not apply.

- When a multimedia object is inserted, prompt the author for relevant alternatives: functional replacement and long description for images, text captions (as text or as a URI), video of signed translations for audio, and audio descriptions for video (as well as alternatives for its audio components).
- Provide an author with the option of specifying alternative information, or electing to insert null alternative information for images, audio, video. Default to an accessibility error such as no `TITLE` or `DESC` element for SVG images. Prompt the author to identify the type of image (decorative, a navigation icon, etc.).
- When video is inserted, prompt the author for a still image as part of the alternative information.
- When inserting objects such as spreadsheets or word processor documents, offer the option of providing a Web-formated version. For example, a spreadsheet or a word processor document in a proprietary

format could also be published as an HTML document. Tools that dynamically generate Web content may use HTTP content negotiation to facilitate this.

- Satisfying checkpoint 3.5 would provide much of the required functionality. Refer also to checkpoint 4.1. Refer also to checkpoint 6.2..
- **Sample:** Amaya prompts the author to provide equivalent text for `IMG` and `AREA` elements, and `CAPTION` for the `TABLE` element.
- Some Techniques listed for different languages, according to Web Content Guidelines checkpoints:

1.1 Provide a text equivalent for every non-text element [Priority 1]

Refer also to WCAG checkpoint 9.1 and WCAG checkpoint 13.10.

Techniques for WCAG checkpoint 1.1

HTML

  - prompt for `longdesc` and `alt` for `img` elements
  - prompt for `alt` for `area` elements
  - prompt for text transcript for audio objects.
  - prompt for collated text transcript for movies.

SVG

Prompt for a `title` and `desc` for each `g` group

SMIL

Prompt for `alt`, `longdesc`, a `text` or `textstream` object for `audio`, `image` and `video` objects

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

Refer also to WCAG checkpoint 1.5 and WCAG checkpoint 9.1.

Techniques for WCAG checkpoint 1.2

HTML

  - Use the same User interface for server and client side image map creations, including prompting for alternatives for each region. Use alternatives provided to generate redundant text-based links for server-side maps.
  - Prompt for text which describes the range and the effect of possible coordinate entries, and generate an alternative, form-based entry system.

1.3 Until user agents 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]

Techniques for WCAG checkpoint 1.3

SMIL

  - Prompt the author to provide an audio track that includes description, if necessary with an alternative version of the video.

1.4 For any time-based multimedia presentation (e.g., a movie or animation), synchronize equivalent alternatives (e.g., captions or auditory descriptions of the visual track) with the presentation. [Priority 1]

Techniques for WCAG checkpoint 1.4

HTML

- Use a format such as SMIL which allows for the inclusion and synchronization of equivalent tracks

XML

- Use SMIL timing to synchronize equivalents

1.5 Until user agents 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 WCAG checkpoint 1.2 and WCAG checkpoint 9.1.

Techniques for WCAG checkpoint 1.5

HTML

Use the `alt` associated with `area` elements to build a redundant text navigation bar

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

Techniques for WCAG 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 WCAG checkpoint 2.2

HTML, SVG, CSS

Where only one color has been specified (for example a background but not foreground) ask the author to specify (or confirm default) colors for other parts, where possible from a range that has sufficient contrast.

3.1 When an appropriate markup language exists, use markup rather than images to convey information. [Priority 2]

Refer also to WCAG guideline 6 and WCAG guideline 11.

Techniques for WCAG checkpoint 3.1

HTML

- Where images are readable through Optical Character Recognition (OCR) as text, use text with CSS styling.

XHTML, XML

- Where images are readable through Optical Character Recognition (OCR) as text use SVG
- Where images are recognizable as mathematical content, use MathML
- Prompt the author to use a markup language for text, mathematics, etc.

6.2 Ensure that equivalents for dynamic content are updated when the dynamic content changes. [Priority 1]

Techniques for WCAG checkpoint 6.2

HTML

- Where scripts change the src attribute of images, prompt the author to include changes in the alt attribute or element content.

SVG, XHTML

- Where SMIL animation is used, prompt the author to ensure that `desc` and `title` elements are appropriately updated by the animation

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]

Techniques for WCAG checkpoint 6.3

HTML

Ask for equivalents for scripts, and applets, for example a movie (and collated text transcripts, audio, etc)

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

Techniques for WCAG checkpoint 6.5

7.1 Until user agents 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 WCAG checkpoint 7.1

HTML (relying on lowsrc attribute - not in W3C recommendation)

Prompt for a non-animated "lowsrc" version of animated images.

7.2 Until user agents 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 WCAG checkpoint 7.2

7.3 Until user agents 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 easily. Refer also to WCAG guideline 8.

Techniques for WCAG checkpoint 7.3

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

Refer also to WCAG guideline 6.

Techniques for WCAG checkpoint 8.1

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 WCAG checkpoint 1.1, WCAG checkpoint 1.2, and WCAG checkpoint 1.5.

Techniques for WCAG checkpoint 9.1

HTML

Use the same interface for defining areas of client- and server-side maps, and produce the image as client-side where possible

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

Techniques for WCAG checkpoint 11.1

Raster images (PNG, JPEG, GIF)

- Use RDF to incorporate textual equivalents in image encodings

Vector images

- Use SVG, and prompt the author to provide appropriate title and desc elements for each g element.

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

Techniques for WCAG checkpoint 11.3

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

Techniques for WCAG checkpoint 11.4

13.2 Provide metadata to add semantic information to pages and sites. [Priority 2]

Refer also to WCAG checkpoint 13.5.

Techniques for WCAG checkpoint 13.2

Images

Metadata can be added to most image formats commonly used on the Web, including PNG, JPEG, GIF, and SVG. @@Include link to rdfpic sample tool that does this (source available too).

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

Refer also to WCAG guideline 1.

Techniques for WCAG checkpoint 14.2

HTML

Provide libraries of accessible clip art to illustrate common concepts, or allow the author to build them. See also ATAG 3.5

3.2 Help the author create structured content and separate information from its presentation. [Relative Priority] (Checkpoint 3.2)

Note: Some checkpoints in Web Content Accessibility Guidelines 1.0 [WCAG10] may not apply.

- Recognize collections of uppercase letters as likely abbreviations (in languages that have case) and prompt the author for an expansion, to be provided in markup (e.g., in HTML, with `ABBR` or `ACRONYM`).
- Prompt the author to identify the structural role of content that has been emphasized through styling.
- In Japanese, Chinese, and other appropriate languages, prompt the author for text that can be used as a ruby for unusual ideographs or ideographic

groups. Refer to [RUBY] .

- Prompt the author for header information for tabular data.
- Prompt the author (and allow them to specify a default suggestion) for the language of a document.
- **Sample:** In future releases Amaya is expected to prompt the author for `"title"` for `ABBR`, `ACRONYM`, `OBJECT`, and `IMG` elements, and `LABEL` for `FORM` controls. The user interface of Amaya was developed to guide authors to produce structured documents. Style in Amaya is created as a stylesheet.
- Techniques for different languages, organized by Web Content Accessibility Guidelines checkpoints:

1.1 Provide a text equivalent for every non-text element [Priority 1]

Refer also to WCAG checkpoint 9.1 and WCAG checkpoint 13.10.
Techniques for WCAG checkpoint 1.1

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

Refer also to WCAG checkpoint 1.5 and WCAG checkpoint 9.1.
Techniques for WCAG checkpoint 1.2

HTML

Ask the author to identify regions in an image map, or to describe how the coordinates will be used so that a form-based input method can be generated.

1.3 Until user agents 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 with the audio track as per WCAG checkpoint 1.4. Refer to WCAG checkpoint 1.1 for information about textual equivalents for visual information.
Techniques for WCAG checkpoint 1.3

1.4 For any time-based multimedia presentation (e.g., a movie or animation), synchronize equivalent alternatives (e.g., captions or auditory descriptions of the visual track) with the presentation. [Priority 1]

Techniques for WCAG checkpoint 1.4

1.5 Until user agents 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 WCAG checkpoint 1.2 and WCAG checkpoint 9.1.
Techniques for WCAG checkpoint 1.5

HTML

Use the `alt` associated with `area` elements to build a redundant text navigation bar

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

Techniques for WCAG checkpoint 2.1

General

Prompt the author to identify a class, or markup element for uses of color.

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 WCAG checkpoint 2.2

3.1 When an appropriate markup language exists, use markup rather than images to convey information. [Priority 2]

Refer also to WCAG guideline 6 and WCAG guideline 11.

Techniques for WCAG checkpoint 3.1

3.3 Use style sheets to control layout and presentation. [Priority 2]

Techniques for WCAG checkpoint 3.3

3.5 Use header elements to convey document structure and use them according to specification. [Priority 2]

Techniques for WCAG checkpoint 3.5

Text / hypertext

- Prompt the author to identify headings and subheadings
- Provide an "outline" or "structure" view which allows the author to easily grasp the heading structure, and edit it.

3.6 Mark up lists and list items properly. [Priority 2]

Techniques for WCAG checkpoint 3.6

text / hypertext

- Include lists (marked as lists) in a collapsible structure view

3.7 Mark up quotations. Do not use quotation markup for formatting effects such as indentation. [Priority 2]

Techniques for WCAG checkpoint 3.7

Where material appears within quote marks ask the author if this is a quotation.

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

Techniques for WCAG checkpoint 4.1

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

Techniques for WCAG checkpoint 4.2

HTML

Ask the author to provide an expansion for `abbr` and `acronym` elements or confirm that a previously supplied one should be used again.

General

Provide a dictionary mechanism that recognizes abbreviations and prompts the author to include appropriate markup.

4.3 Identify the primary natural language of a document. [Priority 3]

Techniques for WCAG checkpoint 4.3

General:

Ask the author to identify the language of any document. Provide a mechanism for setting a default.

5.1 For data tables, identify row and column headers. [Priority 1]

Techniques for WCAG checkpoint 5.1

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 WCAG checkpoint 5.2

HTML

Ask the author to group columns, rows, or blocks of cells that are related.

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). [Priority 2]

Refer also to WCAG checkpoint 3.3.

Techniques for WCAG checkpoint 5.3

HTML

- Prompt the author to identify tables which are used as layout devices.
- For layout tables, provide a linearized version, and offer it as a link from the table or as a replacement. An example tool which linearizes tables is tablin.

5.4 If a table is used for layout, do not use any structural markup for the purpose of visual formatting. [Priority 2]

Techniques for WCAG checkpoint 5.4

5.5 Provide summaries for tables. [Priority 3]

Techniques for WCAG checkpoint 5.5

HTML

- In a table creation wizard, include a summary or caption dialog
- Render the `caption`, `title` and `summary` of a table, or prompt for content.
-

---

dialog screenshot described:

Amaya’s user interface guides the author to include a caption for tables,in the following way: When the author creates a table, a dialog is generated which asks for number of rows, columns, border width dialog screenshot

dialog screenshot described:

The author selects the appropriate information and a table is created. The cursor is placed at the position of the table caption. The status line, which appears at the bottom of the image, shows that the position is in the caption element of the table. (This is a standard part of the Amaya user interface).

5.6 Provide abbreviations for header labels. [Priority 3]

Techniques for WCAG checkpoint 5.6

HTML

Prompt for an abbreviated form of each table header (`th`)

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]

Techniques for WCAG checkpoint 6.1

HTML

Provide a "draft" view which does not use styling.

6.2 Ensure that equivalents for dynamic content are updated when the dynamic content changes. [Priority 1]

Techniques for WCAG checkpoint 6.2

SVG

Prompt for appropriate changes to `title` and `desc` elements which are children of the target of an `animate.`

HTML

See also frames.

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]

Refer also to WCAG guideline 1.

Techniques for WCAG checkpoint 6.3

HTML

- Prompt for server-side alternatives for scripts and applets
- Prompt for `noscript` content for each `script`.
- Prompt for alternative content for applets and programmatic objects (for example `object` elements which have a `code` attribute).

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

Refer to the definition of device independence .

Techniques for WCAG checkpoint 6.4

Applet development

- Prompt the author to include device-indepenent means of activation

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

Techniques for WCAG checkpoint 6.5

HTML

Ask the author for:

- appropriate links and content to include in a `noframes` element
- a server-side alternative to applets and script functions

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

Techniques for WCAG checkpoint 7.1

7.2 Until user agents 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 WCAG checkpoint 7.2

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

Refer also to WCAG guideline 8.

Techniques for WCAG checkpoint 7.3

7.5 Until user agents 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 WCAG checkpoint 7.5

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

Refer also to WCAG guideline 6.

Techniques for WCAG checkpoint 8.1

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 WCAG checkpoint 1.1, WCAG checkpoint 1.2, and WCAG checkpoint 1.5.

Techniques for WCAG checkpoint 9.1

HTML

where regions are not easily defined, ask the author to provide information that can be used to generate a form-based input method and explains how the coordinates input will be used. For example, on a map the input might be used to lookup latitude and longitude of a point and then give information about that point.

9.2 Ensure that any element that has its own interface can be operated in a device-independent manner. [Priority 2]

Refer also to WCAG guideline 8.

Techniques for WCAG checkpoint 9.2

9.3 For scripts, specify logical event handlers rather than device-dependent event handlers. [Priority 2]

Techniques for WCAG checkpoint 9.3

9.4 Create a logical tab order through links, form controls, and objects. [Priority 3]

Techniques for WCAG checkpoint 9.4

HTML

Where there are only a few links that change in each page of a collection, ask the author if they should receive focus first. If so, then give them a tabindex, leaving the rest to after the tabindexed links have been focussed.

9.5 Provide keyboard shortcuts to important links (including those in client-side image maps), form controls, and groups of form controls. [Priority 3]

Techniques for WCAG checkpoint 9.5

HTML

Ask authors to specify an accesskey for links that appear common to a number of pages

10.1 Until user agents 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]

Techniques for WCAG checkpoint 10.1

HTML

Where a link or active element will spawn a new window, prompt the author for `title` text to make this clear.

10.2 Until user agents support explicit associations between labels and form controls, for all form controls with implicitly associated labels, ensure that the label is properly positioned. [Priority 2]

Refer also to WCAG checkpoint 12.4.

Techniques for WCAG checkpoint 10.2

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

Techniques for WCAG checkpoint 10.4

HTML

Prompt the author for default place-holder text. Offer the value of the `name` attribute as a default.

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

Techniques for WCAG checkpoint 10.5

11.2 Avoid deprecated features of W3C technologies. [Priority 2]

Techniques for WCAG 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 WCAG checkpoint 11.3

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

Techniques for WCAG checkpoint 11.4

12.1 Title each frame to facilitate frame identification and navigation. [Priority 1]

Techniques for WCAG checkpoint 12.1

HTML

- Prompt the author for a short, human-readable title for each frame. Default text presented in the prompt could use the `title` defined for the document referenced in the src

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]

Techniques for WCAG checkpoint 12.2

HTML

- Prompt the author for a `longdesc` for each frame in a frameset.
- Prompt the author to add a `noframes` section to the frameset. Encourage the author to include sufficient links to navigate the site, and relevant information. For example, where a frameset defines a navigation frame and a welcome page, include the content of each of these frames in the `noframes`.

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

Refer also to WCAG guideline 3.

Techniques for WCAG checkpoint 12.3

HTML

Where there are more than 10 choices in a list (`select`, `checkbox` or `radio` boxes) ask the author to identify subgroups

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

Techniques for WCAG checkpoint 12.4

HTML

Ask authors to mark explicitly the labels for form inputs (`input` and `textarea` elements)

13.1 Clearly identify the target of each link. [Priority 2]

Techniques for WCAG checkpoint 13.1

General

Prompt the author to provide text which can be used as a title for a link.

13.2 Provide metadata to add semantic information to pages and sites. [Priority 2]

Refer also to WCAG checkpoint 13.5.

Techniques for WCAG checkpoint 13.2

General

Ask authors for information about a page or site. If its function is known (see also WCAG checkpoint 13.9) add this information as metadata.

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

Techniques for WCAG checkpoint 13.3

General

Prompt the author to provide a link or content describing the structure of the site, and its accessibility features.

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

Techniques for WCAG checkpoint 13.4

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

Techniques for WCAG checkpoint 13.5

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

Techniques for WCAG checkpoint 13.6

HTML

Ask authors if lists of links are a group and should be a map.

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

Techniques for WCAG checkpoint 13.7

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

Techniques for WCAG checkpoint 13.8

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

Techniques for WCAG checkpoint 13.9

General

- Pattern-matching - ask authors to specify the role of pages linked from a navigation bar.
- Where common names are used (search, home, map) as links, ask the author to confirm these functions for use in linking.

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

Refer to WCAG checkpoint 1.1 and the example of ascii art in the glossary .

Techniques for WCAG checkpoint 13.10

HTML

Where a PRE element is used with substantial punctuation and non-words, ask for text alternative.

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

Techniques for WCAG checkpoint 14.1

General
- Provide readability ratings for text.
- Provide a thesaurus function
- Provide a grammar-checking function

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

Refer also to WCAG guideline 1.

Techniques for WCAG checkpoint 14.2

3.3 Ensure that prepackaged content conforms to the Web Content Accessibility Guidelines 1.0 [WCAG10] . [Relative Priority] (Checkpoint 3.3)

For example, include captions , an auditory description , and a collated text transcript with prepackaged movies. Refer also to checkpoint 3.4.

- Use formats that allow for accessible annotation to be included in the files, such as SMIL, PNG, and SVG.
- Provide long descriptions, and associated text files with appropriate text equivalent in clip-art collections.
- Provide video description files with prepackaged video.
- Provide text caption files for prepackaged audio, or video with auditory track(s).
- Including pre-written descriptions for all multimedia files (e.g., clip-art) packaged with the tool will save authors time and effort, cause a significant number of professionally written descriptions to circulate on the Web, provide authors with convenient models to emulate when they write their own descriptions, and show authors the importance of description writing.
- Refer also to checkpoint 3.5.
- **Sample:** Amaya does not provide any clip art or other prepackaged content.

3.4 Do not automatically generate equivalent alternatives . Do not reuse previously authored alternatives without author confirmation, except when the function is known with certainty. [Priority 1] (Checkpoint 3.4)

For example, prompt the author for a text equivalent of an image. If the author has already provided a text equivalent for the same image used in another document, offer to reuse that text and prompt the author for confirmation. If the tool automatically generates a "Search" icon, it would be appropriate to automatically reuse the previously authored text equivalent for that icon. Refer also to checkpoint 3.3 and checkpoint 3.5.

Note: Human-authored equivalent alternatives may be available for an object (for example, through checkpoint 3.5 and/or checkpoint 3.3). It is appropriate for the tool to offer these to the author as defaults.

- Items used throughout a Website, such as graphical navigation bars, should have standard alternative information. However the author should be prompted to edit or approve this the first time it is used in a site, and when the destination of the links is changed by the author.
- If the author has not specified alternative text for an `IMG`, or specified that none is required, default to having no `"alt"` attribute, so that an

accessibility problem will be noted. Refer also to checkpoint 4.1.
- Where an object has already been used in a document, the tool should offer the alternative content that was supplied for the first or most recent use as a default.
- **Sample:** Amaya does not provide default `"alt"` text except when copying and pasting images, in which case it copies all attributes with the image.

3.5 Provide functionality for managing, editing, and reusing alternative equivalents for multimedia objects. [Priority 3] (Checkpoint 3.5)

Note: These alternative equivalents may be packaged with the tool, written by the author, retrieved from the Web, etc.

- Maintain a database registry that associates object identity information with alternative information. Whenever an object is used and an equivalent alternative is provided, ask the author whether they want to add the object (or identifying information) and the alternative information to the database. In the case of a text equivalent , the alternate information may be stored in the document source. For more substantial information (such as video captions or audio descriptions), the information may be stored externally and linked from the document source. Allow different alternative information to be associated with a single object.
- **Reference:** >Allow authors to make keyword searches of a description database (to simplify the task of finding relevant images, sound files, etc.). A paper describing a method to create searchable databases for video and audio files is available (refer to [SEARCHABLE]).
- Suggest pre-written descriptions as default text whenever one of the associated files is inserted into the author’s document.
- The use of the Resource Description Framework (RDF) [RDF10] , or formats like SVG can enable a tool to maintain and use libraries of information within the tool and on the Web.
- This checkpoint is priority 3, meaning that in itself, it does not have a critical effect on an authoring tool’s likelihood of producing accessible mark-up. However, certain implementations of this Alternative Information Management Mechanism (AIMM) [APROMPT] have the potential to simultaneously satisfy several higher priority checkpoints and dramatically improve the usability of an access aware authoring tool. In particular:
  1. The AIMM [APROMPT] should maintain a list of associations between object file names and authored responses to prompts for alternative information (per checkpoint 3.1). The alternative information may take the form of short strings (i.e., "alt"-text) or pointers to descriptive files (i.e., "longdesc", transcripts, etc.). Multiple associations for the same object for different languages or contexts should also be handled.
  2. The AIMM [APROMPT] would offer the associated alternative information as a default whenever the appropriate associated object is selected for insertion. If no previous association is found, the field should be left empty (i.e., no purely rule-generated alternative information should be used). **Note:** The term "default" implies that the alternative information is offered for the author’s approval. The term

does not imply that the default alternative information is automatically placed without the author's approval. Such automatic placement may only occur when in situations where the function of the object is known with certainty, per checkpoint 3.4. Such a situation might arise in the case of a "navigation bar builder" that places a navigation bar at the bottom of every page on a site. In this case, it would be appropriate to use the same "alt"-text automatically for every instance of a particular image (with the same target) on every page.
3. The alternative information mechanism should be closely integrated with the pre-written alternative information provided for all packaged multimedia files, per checkpoint 3.3. This would allow the alternative information to be automatically retrieved whenever the author selected one of the packaged objects for insertion. An important benefit of the system would be the ease of adding a keyword search capability that would allow efficient location of multimedia based on its alternative information.

- **Sample:** Amaya has no registry of alternate text associated with images, although when an image is copied and pasted its alt and other attributes are copied too.

Techniques for this guideline:

- Techniques for adding alternative content, organized according to the type of alternative:

  Categories of Equivalent Alternative Information

  - Short Descriptive Text
  - Short Functional Text
  - Longer Descriptive Text
  - Transcripts
  - Auditory Descriptions
  - Redundant Text Links
  - Metadata
  - Alternate Page

GENERAL NOTES:

Basic Prompting refers to those methods that passively inform the author and allow the author to enter text.

Advanced prompting refers to those methods that utilize automation in the process of informing, guiding and correcting the author.

Reference:

- WCAG 3.1 (Convey information with markup rather than images)
- WCAG 2.1 (Ensure information is not conveyed solely by color)

SHORT DESCRIPTIVE TEXT:

Relevant to:

- HTML (ex. alt for img, alt for area, caption for table, etc.)
- SVG (ex. title for g group)
- SMIL (ex. alt for image)

Reference:

- WCAG 1.1 (text equivalents) [Priority 1]

Prompting:

Basic:

- The tool may prompt the author to enter a short (10 word or less) description whenever an element that requires one is added or edited.
- Emphasize that the description alone should provide reader with sufficient information to make sense of the image.
- Provide a link to several high quality described objects in the help (ATAG Checkpoint 6.1).

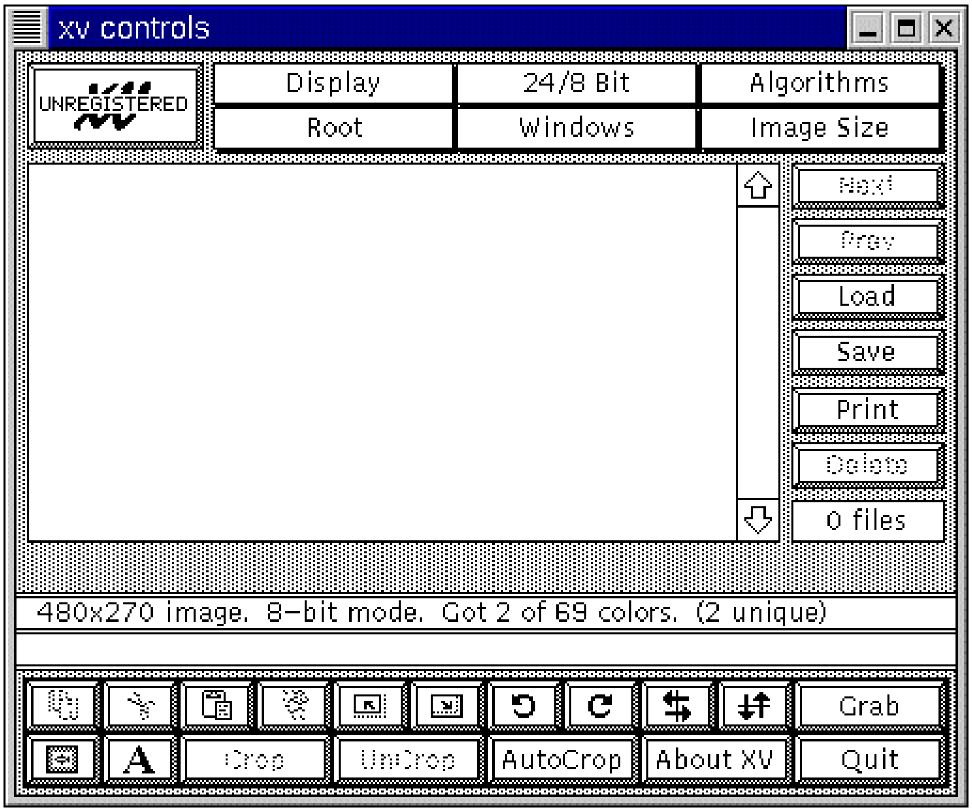
Advanced:

- The object name is not necessarily a good indication of its content and so should not be used as a default text in the prompting field (ATAG Checkpoint 3.4).
- However, if the tool stores previous descriptive text-object associations (including developer authored text for clip art) these can be placed as default in the prompt field (ATAG Checkpoint 3.5).
- In cases where the function of an object is known with certainty (ex. navigation bar), the short descriptive text can copied without requiring author intervention.

Sample Implementations:

Current (Amaya)

When Amaya adds an image, the ALT text attribute is clearly visible, and a value must be entered.



Fictional (based on A-Prompt):

In the fictional case, an alt-text registry could suggest text that had previously been authored for that image. The image itself is displayed to make the definition writing process more efficient.

A dialog proposing previously-authored default text

SHORT FUNCTIONAL TEXT:

Reference:

- WCAG 1.1 (text equivalents) [Priority 1]

Relevant to:

- HTML (ex. alt for img serving as a button, alt for button, etc.)

Prompting:

- The tool may prompt the author to enter a short (10 word or less) description that emphasizes its FUNCTION (rather than the appearance) whenever an element that requires one is added or edited.
- Emphasize that the functional description alone should provide reader with sufficient information about the destination
- Provide a link to a number of well described linked-objects in the help

(ATAG Checkpoint 6.1). [our example here]
- The link destination path is not necessarily a good indication of its content and so should not be used as a default text in the prompting field (ATAG Checkpoint 3.4). If the tool stores previous functional text-object associations these can be placed as default in the prompt field

Sample Implementation:

Fictional (Based on A-Prompt)

Here, the old alt-text is not suggested because the tool has detected that the image is linked and therefore is a functional rather than aesthetic element.

A dialog requesting text for an image used as a link

LONGER DESCRIPTIVE TEXT:

Reference:

- WCAG 1.1 (text equivalents) [Priority 1]

Relevant to:

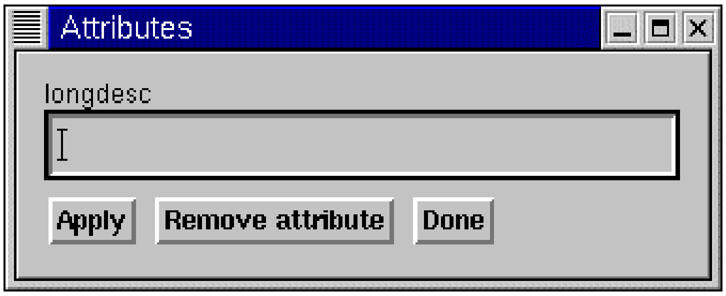
- HTML (ex. longdesc for img, longdesc for frame, etc.)
- SVG (ex. desc for g group)
- SMIL (ex. longdesc for image)

Prompting:

Sample Implementation:

Current (Amaya)

Amaya allows the author to enter a longdesc file name.



Fictional (Based on A-Prompt)

A fictional implementation could save multiple descriptions for the same file (different languages, etc.) and offer them back in the same was as alt-text was above.   Once again the image is displayed to facilitate accurate description writing.

a dialog for longdescs

TRANSCRIPTS:

Reference:

- WCAG 1.1 (text equivalents) [Priority 1]

Relevant to:

- HTML (ex. Text transcript for audio object, Collated text transcript for video)
- SMIL (ex. textstream for video)

AUDITORY DESCRIPTIONS:

Reference:

- WCAG 1.3 (auditory descriptions)
- WCAG 1.4 (synchronization)

Relevant to:

- HTML (ex.)

REDUNDANT TEXT LINKS

Reference:

- WCAG 1.2 (redundant text links for server side image maps) [Priority 1]
- WCAG 1.5 (redundant text links for client-side image maps) [Priority 3]

Relevant to:

- HTML (AREA element)

METADATA

Reference:

- WCAG 13.2 (metadata)

Relevant to:

- HTML, PNG, JPEG, GIF, and SVG

ALTERNATE PAGE

Reference:

- WCAG 6.2, 6.3 (equivalents for scripts, applets, etc.)
- WCAG 6.5 (dynamic content)
- WCAG 11.4 (alternate pages)

Relevant to:

- HTML

Guideline 4. Provide ways of checking and correcting inaccessible content.

Many authoring tools allow authors to create documents with little or no knowledge about the underlying markup. To ensure accessibility, authoring tools must be designed so that they can (where possible, automatically) identify inaccessible markup , and enable its correction even when the markup itself is hidden from the author.

Authoring tool support for the creation of accessible Web content should account for different authoring styles. Authors who can configure the tool's accessibility features to support their regular work patterns are more likely to accept accessible authoring practices (refer to guideline 5). For example, some authors may prefer to be alerted to accessibility problems when they occur, whereas others may prefer to perform a check at the end of an editing session. This is analogous to programming environments that allow users to decide whether to check for correct code during editing or at compilation.

Note: Validation of markup is an essential aspect of checking the accessibility of content.

Checkpoints:

4.1 Check for and inform the author of accessibility problems . [Relative Priority] (Checkpoint 4.1)

Note: Accessibility problems should be detected automatically where possible. Where this is not possible, the tool may need to prompt the author to make decisions or to manually check for certain types of problems.

- **Reference:** The WAI Evaluation and Repair group [WAI-ER] is developing a document that discusses detailed techniques for testing content according to the Web Content Accessibility Guidelines. A draft of that document is available [AUTO-TOOL] .
- Where the tools cannot test for accessibility errors, provide the author with the necessary information, wizards, etc. to check for themselves. Refer also to checkpoint 5.1.
- Include alerts for WCAG 1.0 [WCAG10] Priority 1 checkpoints in the default configuration.

- Provide an editing view that shows equivalent alternatives in the main content view to make it clear that they are necessary. This will make it obvious when they are missing.
- Provide a preview mode that uses alternative content. Although this can give authors a clear understanding of some problems very easily, it should be made clear that there are many ways in which a page may be presented (aurally, text-only, text with pictures separately, on a small screen, on a large screen, etc.). A view that renders the document as it might appear without technologies such as style sheets and images enabled, or the ability to turn those features off and on in the editing view, will also give an author some idea of whether a document's logical order has been correctly preserved, whether alternative text is appropriate, etc.
- Highlight problems detected when documents are opened, when an editing or insertion action is completed, or while an author is editing. Using CSS classes to indicate accessibility problems will enable the author to easily configure the presentation of errors.
- Where there is a change in the writing script used, prompt the author to identify whether there has been a change in language
- Alert authors to accessibility problems when saving.
- Accessibility problems can be highlighted using strategies similar to spell checking within a word processor. Accessibility alerts within the document can be linked to context sensitive help. Refer also to checkpoint 4.2..
- Allow authors to choose different alert levels based on the priority of authoring accessibility recommendations.
- If interruptive warnings are used, provide a means for the author to quickly set the warning to non-obtrusive to avoid frustration.
- **Reference:** There are online tools whose output can be integrated with the user interface. Other tools are available for incorporation in existing software, either as licensed products or in some cases as "open source" solutions. The WAI Evaluation and Repair group maintains information about available tools [WAI-ER] .
- **Reference:** Refer also to the WAI accessibility references listed in techniques for Refer also to checkpoint 1.1..
- **Reference:** The Web Accessibility Initiative's Protocols and Formats group have a draft set of notes about creating accessible markup languages [XMLGL] .
- **Sample:** Amaya currently checks for validity, but the only warning of invalid markup appears in the structure view. The Amaya developers are investigating automating an accessibility check and author notification. Where Amaya detects an error, it identifies and highlights the incorrect code in the structure view, allowing the author to delete it.

4.2 Assist authors in correcting accessibility problems . [Relative Priority] (Checkpoint 4.2)

At a minimum, provide context-sensitive help with the accessibility checking required by checkpoint 4.1

- **Reference:** The WAI Evaluation and Repair group [WAI-ER] is developing a document that discusses detailed techniques for repairing accessibility errors in content according to the Web Content Accessibility Guidelines. A draft of that document is available [AUTO-TOOL] .

- Assist authors in ways that are consistent with the look and feel of the authoring tool.
- Provide context sensitive-help for accessibility errors. Refer also to guideline 6.
- Where there are site-wide errors, to make correction more efficient, allow the author to make site-wide changes or corrections. For example, this may be appropriate for a common error in markup, but may not be appropriate in providing a text equivalent that is appropriate for one use of an image but completely inappropriate for the other uses of the image on the same site (or even the same page).
- Allow authors to control both the nature and timing of the correction process.
- Provide a mechanism for authors to navigate sequentially among uncorrected accessibility errors Refer also to checkpoint 7.4..
- **Sample:** Amaya currently does not satisfy this checkpoint. Amaya uses its own internal representation for the document markup that is transformed on output. Possible implementation strategy: Where there are errors in a document Amaya could alert the author and warn that the document must be changed, and present the structure view highlighting areas where it has changed the markup, allowing the author to abort the editing session or save the changed version under a new name.

4.3 Allow the author to preserve markup not recognized by the tool. [Priority 2] (Checkpoint 4.3)

Note: The author may have included or imported markup that enhances accessibility but is not recognized by the tool.

- Provide a summary of all automated structural changes that may affect accessibility.
- Provide options for the author to confirm or override removal of markup on a change-by-change basis or as a batch process.
- If changes to the markup are necessary for the tool to further process the document (for example, a tool that requires valid markup when a document is opened), inform the author.
- Do not change the DTD without notifying the author.
- **Sample:** Amaya currently does not satisfy this checkpoint.

4.4 Provide the author with a summary of the document’s accessibility status. [Priority 3] (Checkpoint 4.4)

- Provide a list of all accessibility errors found in a Web page.
- Provide a summary of accessibility problems remaining by type and/or by number.
- **Sample:** Amaya currently does not satisfy this checkpoint.

4.5 Allow the author to transform presentation markup that is misused to convey structure into structural markup , and to transform presentation markup used for style into style sheets. [Priority 3] (Checkpoint 4.5)

- Some examples of transformations include: HTML table-based layout into CSS, HTML `BR` to the `P` element, HTML (deprecated) `FONT` into heuristically or author-determined structure, Word processor styles to Web styles, HTML deprecated presentational markup into CSS, XHTML `span` into `ruby`, MathML presentational markup to semantic markup.
- Allow the author to define transformations for imported documents that have presentation, rather than structural, markup.
- Allow the author to create style rules based on the formatting properties of an element, and then apply the rule to other elements in the document, to assist conversion of documents to the use of style sheets
- Include pre-written transformations to rationalize multiple tables, and to transform (deprecated) presentation HTML into style sheets.
- Remember that accessibility information, including attributes or properties of the elements being transformed, must be preserved - see checkpoint 1.2
- **Sample:** Amaya provides a language for specifying structure transformations, and a large number of predefined transformations are included.

Techniques for this guideline:

- Prompts can be used to encourage authors to provide information needed to make the content accessible (such as alternative text equivalents). Prompts are simple requests for information. For example, a text equivalent entry field prominently displayed in an image insertion dialog would constitute a prompt. Prompts are relatively unintrusive and address a problem before it arises. However, once the author has ignored the prompt, its message is unavailable.

  Alerts warn the author that there are problems that need to be addressed. The art of attracting the author's attention is a tricky issue. The way authors are alerted, prompted, or warned can influence their view of the tool and even their opinion of accessible authoring. Refer also to guideline 5.

  User Configurable Schedule
  : A user configurable schedule allows the author to determine the type of prompts and alerts that are used, including when they are presented. For example, an author may wish to include multiple images without being prompted for alternative information, and then provide the alternative information in a batch process, or may wish to be reminded each time an image is added. If the prompting is done on a user-configurable schedule, the author will be able to decide. This technique allows a tool to suit the needs of a wide range of authors.

  Interruptive Alerts
  : Interruptive alerts are informative messages that interrupt the editing process for the author. For example, interruptive alerts are often presented

when an author’s action could cause a loss of data. Interruptive alerts allow problems to be brought to the author’s attention immediately. However, authors may resent the constant delays and forced actions. Many people prefer to finish expressing an idea before returning to edit its format.

Unintrusive Alerts
: Unintrusive alerts are alerts such as icons, underlines, and gentle sounds that can be presented to the author without necessitating immediate action. For example, in some word processors misspelled text is highlighted without forcing the author to make immediate corrections. These alerts allow authors to continue editing with the knowledge that problems will be easy to identify at a later time. However, authors may choose to ignore the alerts altogether.

Guideline 5. Integrate accessibility solutions into the overall "look and feel".

When a new feature is added to an existing software tool without proper integration, the result is often an obvious discontinuity. Differing color schemes, fonts, interaction styles, and even software stability can be factors affecting author acceptance of the new feature. In addition, the relative prominence of different ways to accomplish the same task can influence which one the author chooses. Therefore, it is important that creating accessible content be a natural process when using an authoring tool.

Checkpoints:

5.1 Ensure that functionality related to accessible authoring practices is naturally integrated into the overall look and feel of the tool. [Priority 2] (Checkpoint 5.1)

- Ensure that author can utilize the tool’s accessible authoring features by the same interaction styles used for other features in the program. For example, if the tool makes use of onscreen symbols such as underlines or coloration change rather than dialogs for conveying information, then the same interface techniques should be used to convey accessibility information.
- The same fonts, text sizes, colors, symbols, etc. that characterize other program features should also characterize those dealing with accessibility.
- Include considerations for accessibility - such as the `"alt"` and `"longdesc"` attributes of the HTML `IMG` element - right below the `"src"` attribute in a dialogue box, not buried behind an "Advanced..." button.
- Allow efficient and fast access to accessibility-related settings with as few steps as possible needed to make any changes that will generate accessible content.
- The accessibility features should be designed as integral components of the authoring tool application, not plug-ins or other peripheral components that need to be separately obtained, installed, configured or executed
- The default installation of the authoring tool should include all accessibility features enabled. The author may have the option to disable these features

later on.

- A help page that describes how to make an HTML image map should include adding alternative information for each `AREA` element in the `MAP` as part of the process. Any examples of code should give either block content with text links, or `AREA` elements that all have relevant `"alt"` attribute values.
- When an author creates an HTML frameset, suggest the links from the navigation bar (and perhaps the content of the "first page") as the content for the `NOFRAMES` element.
- **Sample:** In Amaya some accessibility features are part of relevant dialogs. Others, such as longdesc and title attributes must be separately generated by the author. The development team will integrate these into the relevant dialogues in future releases.

5.2 Ensure that accessible authoring practices supporting Web Content Accessibility Guidelines 1.0 [WCAG10] Priority 1 checkpoints are among the most obvious and easily initiated by the author. [Priority 2] (Checkpoint 5.2)

- When the author has selected text to format, the use of CSS should be emphasized rather than the (deprecated) HTML `FONT` element.
- Highlight the most accessible solutions when presenting choices for the author.
- Providing an editing view that shows equivalent alternatives in the main content view will make it clear that they are necessary, and will make it obvious when they are missing.
- If there is more than one option for the author, and one option is more accessible than another, place the more accessible option first and make it the default. For example, when requesting equivalent alternatives for an image with the HTML `OBJECT` element, offer an unchecked option for a null value (i.e., there is no content, implying the image has no real function) with the cursor positioned in the entry field for alternative text (and, if available, provide the appropriate value from the "Alternative Information Management Mechanism"; refer to checkpoint 3.5) rather than offering the filename as a default suggestion, or selecting the null "alt" value as a default.
- **Sample:** Amaya's user interface guides the author to produce structured content, with presentation elements separated into style sheets. Providing an equivalent alternative is mandatory at the time of inserting some elements.

Guideline 6. Promote accessibility in help and documentation.

Web authors may not be familiar with accessibility issues that arise when creating Web content. Therefore, help and documentation must include explanations of accessibility problems , and should demonstrate solutions with examples.

Checkpoints:

6.1 Document all features that promote the production of accessible content. [Priority 1] (Checkpoint 6.1)

- Ensure that accessibility solutions are present in all help text descriptions of markup practices (e.g., HTML `IMG` elements should appear with an `"alt"` attribute and a `"longdesc"` attribute wherever appropriate).
- Ensure that electronic documentation complies with the Web Content Accessibility Guidelines 1.0 [WCAG10]
- Link from help text to any automated correction utilities.
- Provide examples of accessible design practices in online tutorials.
- Include help documentation for all accessible authoring practices supported by the tool.
- Link those mechanisms used to identify accessibility problems (e.g., icons, outlining or other emphasis within the user interface) to help files.
- **Sample:** Amaya help pages for images and image maps [AMAYA-HELP-IMG] include providing text alternatives as part of the process. There is a help page on configuring Amaya, that documents how to change the default keyboard bindings.

6.2 Ensure that creating accessible content is a naturally integrated part of the documentation, including examples. [Priority 2] (Checkpoint 6.2)

- In help text, when explaining the accessibility issues related to non-deprecated elements, emphasize appropriate solutions rather than explicitly discouraging the use of the element.
- Explain the importance of utilizing accessibility features generally and for specific instances.
- Take a broad view of accessibility-related practices; for example, do not refer to text equivalents as being "for blind authors" but rather as "for authors who are not viewing images".
- Avoid labelling accessibility features of the tool with a "handicapped" icon, as this can give the impression that accessible design practices only benefit disabled authors.
- In help text, emphasize accessibility features that benefit multiple groups. In particular the principles of supporting flexible display and control choices have obvious advantages for the emergence of hands free, eyes-free, voice-activated browsing devices such as Web phone, the large number of slow Web connections, and Web users who prefer text-only browsing to avoid "image clutter".
- Provide examples of all accessibility solutions in help text, including those of lower priority in WCAG 1.0 [WCAG10] .
- Implement context-sensitive help for all special accessibility terms as well as tasks related to accessibility.
- Document the tool's conformance to ATAG 1.0 [ATAG10] .
- Include current versions of, or links to relevant specifications in the documentation (e.g. HTML 4 [HTML4] , CSS [CSS2] .) This is particularly

relevant for markup languages that are easily hand edited, such as most XML languages [XML] .
- Include a tutorial specifically on checking for and correcting Web accessibility problems.
- Link to or provide URIs for more information on accessible Web authoring, such as WCAG 1.0 [WCAG10] , and other accessibility-related resources.
- Ensure that documentation examples conform to WCAG 1.0 [WCAG10] , at least to the level that the tool conforms to ATAG 1.0 [ATAG10] .
- Clearly label any examples that display practices that reduce accessibility.
- **Sample:** Accessible authoring features are added to the documentation as they are incorporated into Amaya, as part of the normal documentation of the relevant feature.

6.3 In a dedicated section, document all features of the tool that promote the production of accessible content. [Priority 3] (Checkpoint 6.3)
- **Sample:** Amaya documentation has a basic accessibility section.

Guideline 7. Ensure that the authoring tool is accessible to authors with disabilities.

The authoring tool is a software program with standard user interface elements and as such must be designed according to relevant user interface accessibility guidelines. When custom interface components are created, it is essential that they be accessible through the standard access mechanisms for the relevant platform so that assistive technologies can be used with them.

Some additional user interface design considerations apply specifically to Web authoring tools. For instance, authoring tools must ensure that the author can edit (in an editing view) using one set of stylistic preferences and publish using different styles. Authors with low vision may need large text when editing but want to publish with a smaller default text size. The style preferences of the editing view must not affect the markup of the published document.

Authoring tools must also ensure that the author can navigate a document efficiently while editing, regardless of disability. Authors who use screen readers, refreshable braille displays, or screen magnifiers can make limited use (if at all) of graphical artifacts that communicate the structure of the document and act as signposts when traversing it. Authors who cannot use a mouse (e.g., people with physical disabilities or who are blind) must use the slow and tiring process of moving one step at a time through the document to access the desired content, unless more efficient navigation methods are available. Authoring tools should therefore provide an editing view that conveys a sense of the overall structure and allows structured navigation.

Note: Documentation, help files, and installation are part of the software and need to be available in an accessible form.

Checkpoints:

7.1 Use all applicable operating system and accessibility standards and conventions (Priority 1 for standards and conventions that are essential to accessibility; Priority 2 for those that are important to accessibility; Priority 3 for those that are beneficial to accessibility). (Checkpoint 7.1)

The techniques for this checkpoint include references to checklists and guidelines for a number of platforms and to general guidelines for accessible applications.

- Not all of the guidelines and checklists for application accessibility are prioritized according to their impact on accessibility. For instance, the priorities in "The Microsoft Windows Guidelines for Accessible Software Design" [MS-SOFTWARE] are partially determined by a logo requirement program. Therefore developers may need to compare the documents they are using to other guidelines. WCAG 1.0 [WCAG10] and UAAG 1.0 [UAAG10] both have priority systems that are directly compatible with the priorities in [ATAG10] .
- User Interfaces are sometimes built as Web content, and, as such, should follow the Web Content Accessibility Guidelines 1.0 [WCAG10] . Refer also to guideline 1.
- Guidelines for specific platforms include
  1. **Reference:** "IBM Guidelines for Writing Accessible Applications Using 100% Pure Java" [JAVA-ACCESS] R. Schwerdtfeger, IBM Special Needs Systems.
  2. **Reference:** "An ICE Rendezvous Mechanism for X Window System Clients" [ICE-RAP] , W. Walker. A description of how to use the ICE and RAP protocols for X Window clients.
  3. **Reference:** "Information for Developers About Microsoft Active Accessibility" [MSAA] Microsoft Corporation.
  4. **Reference:** "The Inter-Client communication conventions manual" [ICCCM] . A protocol for communication between clients in the X Window system.
  5. **Reference:** "Lotus Notes accessibility guidelines" [NOTES-ACCESS] IBM Special Needs Systems.
  6. **Reference:** "Java accessibility guidelines and checklist" [JAVA-CHECKLIST] IBM Special Needs Systems.
  7. **Reference:** "The Java Tutorial. Trail: Creating a GUI with JFC/Swing" [JAVA-TUT] . An online tutorial that describes how to use the Swing Java Foundation Class to build an accessible User Interface.
  8. **Reference:** "Macintosh Human Interface Guidelines" [APPLE-HI] Apple Computer Inc.
  9. **Reference:** "The Microsoft Windows Guidelines for Accessible Software Design" [MS-SOFTWARE] .
- Guidelines for specific software types include
  1. **Reference:** "The Three-tions of Accessibility-Aware HTML Authoring

   Tools" [ACCESS-AWARE] , J. Richards.
   2. **Reference:** "User Agent Accessibility Guidelines (Working Draft)" J. Gunderson, I. Jacobs eds. (This is a work in progress) [UAAG10]
- General guidelines for producing accessible software include:
   1. **Reference:** "Accessibility for applications designers" [MS-ENABLE] Microsoft Corporation.
   2. **Reference:** "Application Software Design Guidelines" [TRACE-REF] compiled by G. Vanderheiden. A thorough reference work.
   3. **Reference:** "Designing for Accessibility" [SUN-DESIGN] Eric Bergman and Earl Johnson. This paper discusses specific disabilities including those related to hearing, vision, and cognitive function.
   4. **Reference:** "EITAAC Desktop Software standards" [EITAAC] Electronic Information Technology Access Advisory (EITACC) Committee.
   5. **Reference:** "Requirements for Accessible Software Design" [ED-DEPT] US Department of Education, version 1.1 March 6, 1997.
   6. **Reference:** "Software Accessibility" [IBM-ACCESS] IBM Special Needs Systems
   7. **Reference:** "Towards Accessible Human-Computer Interaction" [SUN-HCI] Eric Bergman, Earl Johnson, Sun Microsytems 1995. A substantial paper, with a valuable print bibliography.
   8. **Reference:** "What is Accessible Software" [WHAT-IS] James W. Thatcher, Ph.D., IBM, 1997. This paper gives a short example-based introduction to the difference between software that is accessible, and software that can be used by some assistive technologies.
- The following are common requirements for producing accessible software. This list does not necessarily cover all requirements for all platforms, and items may not apply to some software.

   Following Standards

   - Draw text and objects using system conventions.
   - Make mouse, keyboard, and API activation of events consistent.
   - Provide a user interface that is "familiar" (to system standards, or across platform).
   - Use system standard indirections and APIs wherever possible.
   - Ensure all dialogs, subwindows, etc., satisfy these requirements.
   - Avoid blocking assistive technology functions (sticky/mouse keys, screenreader controls, etc.) where possible.

   Configurability

   - Allow users to create profiles.
   - Allow control of timing, colors, sizes, input/output devices and media.
   - Allow users to reshape the user interface - customize toolbars, keyboard commands, etc.

Input Device Independence

- Provide Keyboard access to all functions.
- Document all keyboard bindings.
- Provide customizable keyboard shortcuts for common functions.
- Provide logical navigation order for the keyboard interface.
- Avoid repetitive keying wherever possible.
- Provide mouse access to functions where possible.

Icons, Graphics, Sounds

- Provide graphical (text) equivalents for sound warnings.
- Allow sounds to be turned off.
- Provide text equivalents for images/icons.
- Use customizable (or removable) colors/patterns.
- Ensure high contrast is available (as default setting).
- Provide text equivalents for all audio.
- Use icons that are resizeable or available in multiple sizes.

Layout

- Do not rely on color alone for meaning. Use color for differentiation, in combination with accessible cues (text equivalents, natural language, etc.).
- Position related text labels and objects consistently, and in an obvious manner (labels before objects is recommended).
- Group related controls.
- Ensure default window sizes fit in screen.
- Allow for window resizing (very small to very large).

User Focus

- Clearly identify the user focus (and expose it via API).
- Unexpected events should not be caused by viewing content (for example by moving the focus to a new point).
- Allow user control of timing - delays, time-dependent response, etc.
- Allow for navigation between as well as within windows.

Documentation

- Provide documentation for all features of the tool.
- Ensure that help functions are accessible.

- **Sample:** Amaya is currently available for two platforms: Unix and Windows. There is some work required on both platforms to bring it into line with conventions, in particular to provide conformance with the User Agent Guidelines [UAAG10] , and to implement Microsoft Active Accessibility [MSAA] in the Windows version. It is being re-written to take advantage of the improved accessibility support possible in Gnome (it currently uses Motif) in the Unix version. The Documentation is all available online as HTML and has been reviewed to ensure it conforms to WCAG 1.0 [WCAG10] .

7.2 Allow the author to change the presentation within editing views without affecting the document markup. [Priority 1] (Checkpoint 7.2)

This allows the author to edit the document according to personal requirements, without changing the way the document is rendered when published.

- In representing the source structure of a document mark elements with text brackets rather than with purely graphic representations. For example, "</>" is regarded as a text bracket, since it is made of character elements.
- Allow the author to create audio style sheets using a graphical representation rather than an audio one (with accessible representation, of course).
- An authoring tool that offers a "rendered view" of a document, such as a browser preview mode, may provide an editing view whose presentation can be controlled independently of the rendered view.
- A WYSIWYG editor may allow an author to specify a local style sheet, that will override the "published" style of the document in the editing view.
- **Sample:** Amaya allows the author to create local style sheets, and to enable or disable each style sheet that is linked to a document.

7.3 Allow the author to edit all properties of each element and object in an accessible fashion. [Priority 1] (Checkpoint 7.3)

- An authoring tool may offer several editing views of the same document, such as a source mode that allows direct editing of all properties.
- Allow the author to individually edit each attribute of the elements in an HTML or XML document, for example, through a menu. **Note:** This must include the ability to add valid values for attributes that are not present, as well as changing current values of attributes.
- For a site management tool, allow the author to render a site map in text form (e.g., as a structured tree file).
- Allow the author to specify that alternative information (or identifiers such as a URI or filename) are rendered in place of images or other multimedia content while editing.
- Include attributes / properties of elements in a view of the structure.
- Provide access to a list of properties via a "context menu" for each element.
- Graphically represented elements cannot be identified by assistive technologies that render text as braille, speech, or large print, unless there is appropriate information available as text. For example, some HTML authoring tools render start and end tags as graphics. Such tag representations need to have a text equivalent to be accessible to assistive technologies.
- **Sample:** Amaya allows each attribute to be edited through the menu or through the structure view. Element types can be assigned through the menu system.

7.4 Ensure that the editing view allows navigation via the structure of the document in an accessible fashion. [Priority 1] (Checkpoint 7.4)

- Some tools, such as those used to translate from one format to another, do not have an editing view.
- Allow the author to navigate via an "outline" or "structure" of the document being edited. This is particularly important for people who are using a slow interface such as a small braille device, or speech output, or a single switch input device. It is equivalent to the ability provided by a mouse interface to move rapidly around the document.
- To minimally satisfy this checkpoint, allow navigation from element to element.
- In a hypertext document allow the author to navigate among links and active elements of a document.
- For SMIL and other time-based presentations, allow the author to navigate temporally through the presentation.
- Allow the author to navigate regions of an image, or the document tree for an image expressed in a structured language such as Scalable Vector Graphics [SVG] .
- Implement the HTML `"accesskey"` attribute, and activate it in editing views
- **Sample:** Amaya provides a structure view, that can be navigated element by element, a Table of Contents view, that allows navigation via the headings, and a links view, that allows sequential navigation via the links in the document. It also provides configurable keyboard navigation of the HTML structure - parent, child, next and previous sibling elements.

7.5 Enable editing of the structure of the document in an accessible fashion. [Priority 2] (Checkpoint 7.5)

- An authoring tool may offer a structured tree view of the document, allowing the author to move among, select and cut, copy or paste elements of the document.
- A WYSIWYG tool may allow elements to be selected, and copied or moved while retaining their structure.
- A tool may allow transformation from one element type to another, such as
    1. HTML paragraphs to lists and back;
    2. HTML `BR` to `P`;
    3. SMIL transformations between `switch`, `excl`, and `par`;
    4. HTML (deprecated) `FONT` into heuristically determined structure;
    5. Lists of lists to tables and back;
    6. MathML transformations between semantic and presentation markup;
    7. Transforming the SVG `g` element to `symbol`;
    8. Giving a structural role to a part of an element, such as an SVG `g` or an HTML `p` element.
- **Sample:** Amaya allows the author to select elements (including containers) and cut, copy and paste them with their attributes and properties in any of the formatted, structure and alternate views.

7.6 Allow the author to search within editing views . [Priority 2] (Checkpoint 7.6)

- Search functions are already present in almost every text and hypertext editing tools. The simplest allow searching for a sequence of characters, while more powerful searches can include the ability to perform searches that are case sensitive or case-insensitive, the ability to replace a search string, the ability to repeat a previous search to find the next or previous occurrence, or to select multiple occurrences with a single search.
- The ability to search for a particular type of structure is useful in a structured document, structured image such as a complex SVG image, etc.
- In an image editor, the ability to select an area by properties (such as color, or closeness of color) is useful. This is common in middle range and high end image processing software.
- The ability to search a database for particular content, or to search a collection of files at once (a simple implementation of the latter is the Unix function "grep") is an important tool in managing large collections, especially those that are dynamically converted into Web content.
- The use of metadata (per WCAG 1.0 [WCAG10]) can allow for very complex searching of large collections, or of timed presentations. Refer also to the paper "A Comparison of Schemas for Dublin Core-based Video Metadata Representation" [SEARCHABLE] for discussion specifically addressing timed multimedia presentations.
- **Sample:** Amaya provides a search function. Because all editing views are synchronized, any search text found will be selected in each of the available views.

3 Glossary of Terms and Definitions

Accessibility (Also: ***Accessible***)

Within these guidelines, "accessible Web content" and "accessible authoring tool" mean that the content and tool can be used by people regardless of disability.

To understand the accessibility issues relevant to authoring tool design, consider that many authors may be creating content 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 display, or a small screen.

Accessible design will benefit people in these different authoring scenarios and also many people who do not have a physical disability but who have similar needs. For example, someone may be working in a noisy environment and thus require an alternative representation of audio information. Similarly, someone may be working in an eyes-busy environment and thus require an audio equivalent to information they cannot view. Users of small mobile devices (with small screens, no keyboard, and no mouse) have similar functional needs as some users with disabilities.

Accessibility Awareness

An "accessibility-aware" application is one that has been designed to account for authors' differing needs, abilities, and technologies. In the case of authoring tools, this means that (1) care has been taken to ensure that the content produced by user-authors is accessible and (2) that the user interface has been designed to be usable with a variety of display and control technologies.

Accessibility Information

"Accessibility information" is content, including information and markup, that is used to improve the accessibility of a document. Accessibility information includes, but is not limited to, equivalent alternative information .

Accessibility Problem (Also: ***Inaccessible Markup***)

Inaccessible Web content or authoring tools cannot be used by some people with disabilities. The Web Content Accessibility Guidelines 1.0 [WCAG10] describes how to create accessible Web content.

Accessible Authoring Practice

"Accessible authoring practices" improve the accessibility of Web content. Both authors and tools engage in accessible authoring practices. For example, authors write clearly, structure their content, and provide navigation aids. Tools automatically generate valid markup and assist authors in providing and managing appropriate equivalent alternatives.

Alert

An "alert" draws the author's attention to an event or situation. It may require a response from the author. An alert warns the author that there are problems that need to be addressed. Attracting the author's attention artfully can be challenging, since author perceptions of alerts, prompts, and warnings can influence opinions of the tool and even of accessible authoring.

An ***Unintrusive Alert*** is an alert such as an icon, underlining, or gentle sound that can be presented to the author without necessitating immediate action. For example, in some word processors misspelled text is highlighted without forcing the author to make immediate corrections. These alerts allow authors to continue editing with the knowledge that problems will be easy to identify at a later time. However, authors may become annoyed at the extra formatting or may choose to ignore the alerts altogether.

An ***Interruptive Alert*** is an informative message that interrupts the editing process for the author. For example, interruptive alerts are often presented when an author's action could cause a loss of data. Interruptive alerts allow problems to be brought to the author's attention immediately. However, authors may resent the constant delays and forced actions. Many people prefer to finish expressing an idea before returning to edit its format.

Alternative Information (Also: ***Equivalent Alternative***)

Content is "equivalent" to other content when both fulfill essentially the same function or purpose upon presentation to the user. Equivalent alternatives play an important role in accessible authoring practices since certain types of content may not be accessible to all users (e.g., video, images, audio, etc.). Authors are encouraged to provide text equivalents for non-text content since text may be rendered as synthesized speech for individuals who have visual or learning disabilities, as braille for individuals who are blind, or as graphical text for individuals who are deaf or do not have a disability. For more information about equivalent alternatives, please refer to the Web Content Accessibility Guidelines WCAG 1.0 [WCAG10] .

Text equivalents for still images can be short ("Site Map Link") or long (e.g., "Figure 4 shows that the population of bacteria doubled approximately every twenty hours over the first one hundred hours, increasing from about 1000 per milliliter to about 32,000 per milliliter."). Text equivalents for audio clips are called "text transcripts". Captions are essential text equivalents for movie audio. Another essential text equivalent for a movie is a "collated text transcript ." An essential non-text equivalent for movies is "auditory description " of the key graphical elements of a presentation.

Attribute

This document uses the term "attribute" as used in SGML and XML ([XML]): Element types may be defined as having any number of attributes. Some attributes are integral to the accessibility of content (e.g., the "`alt`", "`title`", and "`longdesc`" attributes in HTML).

In the following example, the attributes of the `beverage` element type are "`flavour`", which has the value "lots", and "`colour`", which has the value "red":

```
<beverage flavour="lots" colour="red">my favourite</beverage>
```

Auditory Description

An "auditory description" provides information about actions, body language, graphics, and scene changes in a video. Auditory descriptions are commonly used by people who are blind or have low vision, although they may also be used as a low-bandwidth equivalent on the Web. An auditory description is either a pre-recorded human voice or a synthesized voice (recorded or automatically generated in real time). The auditory description must be synchronized with the auditory track of a video presentation, usually during natural pauses in the auditory track.

Authoring Tool

An "authoring tool" is any software that is used to produce content for publishing on the Web. Authoring tools include:

- Editing tools specifically designed to produce Web content (e.g., WYSIWYG HTML and XML editors);
- Tools that offer the option of saving material in a Web format (e.g., word processors or desktop publishing packages);
- Tools that transform documents into Web formats (e.g., filters to transform desktop publishing formats to HTML);
- Tools that produce multimedia, especially where it is intended for use on the Web (e.g., video production and editing suites, SMIL authoring packages);
- Tools for site management or site publication, including tools that automatically generate Web sites dynamically from a database, on-the-fly conversion and Web site publishing tools;
- Tools for management of layout (e.g., CSS formatting tools).

Automated Markup Insertion Function

"Automated markup insertion functions" are the features of an authoring tool that allow the author to produce markup without directly typing it. This includes a wide range of tools from simple markup insertion aids (such as a bold button on a toolbar) to markup managers (such as table makers that include powerful tools such as "split cells" that can make multiple changes) to high level site building wizards that produce almost complete documents on the basis of a series of author preferences.

Captions

"Captions" are essential text equivalents for movie audio. Captions consist of a text transcript of the auditory track of the movie (or other video presentation) that is synchronized with the video and auditory tracks. Captions are generally rendered graphically and benefit people who can see but are deaf, hard-of-hearing, or cannot hear the audio.

Conversion Tool

A "conversion tool" is any application or application feature (e.g., "Save as HTML") that transforms convent in one format to another format (such as a markup language).

Check for

As used in checkpoint 4.1, "check for" can refer to three types of checking:

1. In some instances, an authoring tool will be able to check for accessibility

problems automatically. For example, checking for validity (checkpoint 2.2) or testing whether an image is the only content of a link.
2. In some cases, the tool will be able to "suspect" or "guess" that there is a problem, but will need confirmation from the author. For example, in making sure that a sensible reading order is preserved a tool can present a linearized version of a page to the author.
3. In some cases, a tool must rely mostly on the author, and can only ask the author to check. For example, the tool may prompt the author to verify that equivalent alternatives for multimedia are appropriate. This is the minimal standard to be satisfied. Subtle, rather than extensive, prompting is more likely to be effective in encouraging the author to verify accessibility where it cannot be done automatically.

Current User Selection
: When several views co-exist, each may have a selection , but only one is active, called the "current user selection." User selections may be rendered specially (e.g., graphically highlighted).

Description Link (D-link)
: A "description link", or D-Link, is an author-supplied link to additional information about a piece of content that might otherwise be difficult to access (image, applet, video, etc.).

Document
: A "document" is a series of elements that are defined by a markup language (e.g., HTML 4 or an XML application).

Editing an element
: "Editing an element" involves making changes to one or more of an element's attributes or properties. This applies to all editing, including, but not limited to, direct coding in a text editing mode, making changes to a property dialog or direct User Interface manipulation.

Editing View
: An "editing view" is a view provided by the authoring tool that allows editing.

Element
: An "element" is any identifiable object within a document, for example, a character, word, image, paragraph or spreadsheet cell. In [HTML4] and [XML] , an element refers to a pair of tags and their content, or an "empty" tag - one that requires no closing tag or content.

Focus
: The "focus" designates the active element (e.g., link, form control, element with associated scripts, etc.) in a view that will react when the user next interacts with the document.

Generation Tool
: A "generation tool" is a program or script that produces automatic markup "on the fly" by following a template or set of rules. The generation may be performed on either the server or client side.

Image Editor
: An image editor is a graphics program that provides a variety of options for altering images of different formats.

Inform
: To "inform" is to make the author aware of an event or situation through alert , prompt , sound, flash, or other means.

Inserting an element
: "Inserting an element" involves placing that element's markup within the markup of the file. This applies to all insertions, including, but not limited to, direct coding in a text editing mode, choosing an automated insertion from a pull-down menu or tool bar button, "drag-and-drop" style insertions, or "paste" operations.

Markup Language
: Authors encode information using a "markup language" such as HTML [HTML4] , SVG [SVG] , or MathML [MATHML] .

Multimedia Authoring Tool
: A "multimedia authoring tool" is software that facilitates integration of diverse media elements into an comprehensive presentation format. Multimedia includes video, audio, images, animations, simulations, and other interactive components.

Presentation Markup
: "Presentation markup" is markup language that encodes information about the desired presentation or layout of the content. For example, Cascading Style Sheets ([CSS1] , [CSS2]) can be used to control fonts, colors, aural rendering, and graphical positioning. Presentation markup should not be used in place of structural markup to convey structure. For example, authors should mark up lists in HTML with proper list markup and style them with CSS (e.g., to control spacing, bullets, numbering, etc.). Authors should not use other CSS or HTML incorrectly to lay out content graphically so that it resembles a list.

Prompt
: A "prompt" is a request for author input, either information or a decision. A prompt requires author response. For example, a text equivalent entry field prominently displayed in an image insertion dialog would constitute a prompt. Prompts can be used to encourage authors to provide information needed to make content accessible (such as alternative text equivalents).

Property
: A "property" is a piece of information about an element, for example structural information (e.g., it is item number 7 in a list, or plain text) or presentation information (e.g., that it is marked as bold, its font size is 14). In XML and HTML, properties of an element include the type of the element (e.g., `IMG` or `DL`), the values of its attributes , and information associated by means of a style sheet. In a database, properties of a particular element may include values of the entry, and acceptable data types for that entry.

Publishing Tool
: A "publishing tool" is software that allows content to be uploaded in an integrated fashion. Sometimes these tools makes changes such as local hyper-reference modifications. Although these tools sometimes stand alone, they may also be integrated into site management tools.

Rendered Content
: The "rendered content" of an element is that which the element actually causes

to be rendered by the user agent. This may differ from the element's structural content. For example, some elements cause external data to be rendered (e.g., the `IMG` element in [HTML4]), and in some cases, browsers may render the value of an attribute (e.g., `"alt"`, `"title"`) in place of the element's content.

Rendered View, Preview

A "rendered view" simulates for the author how a user will interact with the content being edited once published.

Selection

A "selection" is a set of elements identified for a particular operation. The user selection identifies a set of elements for certain types of user interaction (e.g., cut, copy, and paste operations). The user selection may be established by the user (e.g., by a pointing device or the keyboard) or via an accessibility Application Programmatic Interface (API). A view may have several selections, but only one user selection.

Site Management Tool

A "site management tool" provides an overview of an entire Web site indicating hierarchical structure. It will facilitate management through functions that may include automatic index creation, automatic link updating, and broken link checking.

Structural Markup

"Structural markup" is markup language that encodes information about the structural role of elements of the content. For example, headings, sections, members of a list, and components of a complex diagram can be identified using structural markup. Structural markup should not be used incorrectly to control presentation or layout. For example, authors should not use the `BLOCKQUOTE` element in HTML [HTML4] to achieve an indentation visual layout effect. Structural markup should be used correctly to communicate the roles of the elements of the content and presentation markup should be used separately to control the presentation and layout.

Transcript

A "transcript" is a text representation of sounds in an audio clip or an auditory track of a multimedia presentation. A "collated text transcript" for a video combines (collates) caption text with text descriptions of video information (descriptions of the actions, body language, graphics, and scene changes of the visual track). Collated text transcripts are essential for individuals who are deaf-blind and rely on braille for access to movies and other content.

Transformation

A "transformation" is a process that changes a document or object into another, equivalent, object according to a discrete set of rules. This includes conversion tools , software that allows the author to change the DTD defined for the original document to another DTD, and the ability to change the markup of lists and convert them into tables.

User Agent

A "user agent" is software that retrieves and renders Web content. User agents include browsers, plug-ins for a particular media type, and some assistive technologies.

User-Configurable Schedule

A "user-configurable schedule" allows the user to determine the type of prompts and alerts that are used, including when they are presented. For example, a user may wish to include multiple images without being prompted for alternative information, and then provide the alternative information in a batch process, or may wish to be reminded each time they add an image. If the prompting is done on a user-configurable schedule they will be able to make that decision themselves. This technique allows a tool to suit the needs a wide range of authors.

Video Editor

A "video editor" is software for manipulating video images. Video editing includes cutting segments (trimming), re-sequencing clips, and adding transitions and other special effects.

View

Authoring tools may render the same content in a variety of ways; each rendering is called a "view." Some authoring tools will have several different types of view, and some allow views of several documents at once. For instance, one view may show raw markup, a second may show a structured tree, a third may show markup with rendered objects while a final view shows an example of how the document may appear if it were to be rendered by a particular browser. A typical way to distinguish views in a graphic environment is to place each in a separate window.

4 Acknowledgments

Many thanks to the following people who have contributed through review and comment: Jim Allan, Denis Anson, Kitch Barnicle, Kynn Bartlett, Harvey Bingham, Judy Brewer, Carl Brown, Dick Brown, Wendy Chisholm, Aaron Cohen, Rob Cumming, Daniel Dardailler, Mark Day, BK Delong, Martin Dürst, Kelly Ford, Jamie Fox, Edna French, Sylvain Galineau, Al Gilman, Jon Gunderson, Eric Hansen, Phill Jenkins, Len Kasday, Brian Kelly, Marja-Riitta Koivunen, Sho Kuwamoto, Jaap van Lelieveld, Susan Lesch, William Loughborough, Greg Lowney, Karen McCall, Thierry Michel, Charles Oppermann, Dave Pawson, Dave Poehlman, Loretta Reid, Bruce Roberts, Chris Ridpath, Gregory Rosmaita, Bridie Saccocio, Janina Sajka, John Slatin, Jim Thatcher, Irène Vatton, Gregg Vanderheiden, Pawan Vora, Jason White, and Lauren Wood.

5 References

For the latest version of any W3C specification please consult the list of W3C Technical Reports at http://www.w3.org/TR.

[ACCESS-AWARE]
: "The Three-tions of Accessibility-Aware HTML Authoring Tools," J. Richards.

[AMAYA]
: Amaya, developed at W3C, is both an authoring tool and browser with a WYSIWYG-style user interface. Amaya serves as a testbed for W3C specifications. Source code, binaries, and further information are available at http://www.w3.org/Amaya/. The techniques in this document are based on Amaya version 2.4.

[AMAYA-HELP-IMG]
: "Images and Client-side Image Maps," Amaya's Help page for images and image maps.

[AMAYA-SAMPLE]
: "Amaya - Authoring Tool Accessibility Guidelines 1.0 sample implementation" Describes how Amaya, W3C's WYSIWYG browser/authoring tool, satisfies the guidelines.

[APPLE-HI]
: "Macintosh Human Interface Guidelines," Apple Computer Inc.

[APROMPT]
: The A-prompt tool allows authors to check many accessibility features in HTML pages, and incorporates an "Alternative Information Management Mechanism" (AIMM)) to manage equivalent alternative information for known resources. The tool is built in such a way that the functions can be incorporated into an authoring tool. A-prompt tool is a freely available example tool developed by the Adaptive Technology Resource Center at the University of Toronto, and the TRACE center at the University of Wisconsin. The source code for the tool is also available at http://aprompt.snow.utoronto.ca.

[ATAG10]
: "Authoring Tool Accessibility Guidelines 1.0," J. Treviranus, C. McCathieNevile, I. Jacobs, and J. Richards, eds. The latest version is available at http://www.w3.org/TR/ATAG10.

[AUTO-TOOL]
: "Techniques For Evaluation And Implementation Of Web Content Accessibility Guidelines," C. Ridpath.

[CSS1]
: "CSS, level 1 Recommendation," B. Bos and H. Wium Lie, eds., 17 December 1996, revised 11 January 1999. This 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. **Note:** CSS1 has been superseded by CSS2. Tools should implement the CSS2 cascade.

[CSS2]
: "CSS, level 2 Recommendation," B. Bos, H. Wium Lie, C. Lilley, and I. Jacobs,

eds., 12 May 1998. This 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.

[CSS2-ACCESS]
"Accessibility Features of CSS," I. Jacobs and J. Brewer, eds., 4 August 1999. This W3C Note is http://www.w3.org/1999/08/NOTE-CSS-access-19990804. The latest version of Accessibility Features of CSS is available at http://www.w3.org/TR/CSS-access.

[ED-DEPT]
"Requirements for Accessible Software Design," US Department of Education, version 1.1 March 6, 1997.

[EITAAC]
"EITACC Desktop Software standards," Electronic Information Technology Access Advisory (EITACC) Committee.

[HTML-XML-VALIDATOR]
The W3C HTML Validation Service validates HTML and XHTML markup.

[HTML4]
"HTML 4.01 Recommendation," D. Raggett, A. Le Hors, and I. Jacobs, eds., 24 December 1999. This HTML 4.01 Recommendation is http://www.w3.org/TR/1999/REC-html401-19991224. The latest version of HTML 4 is available at http://www.w3.org/TR/html4.

[HTML4-ACCESS]
"WAI Resources: HTML 4.0 Accessibility Improvements," I. Jacobs, J. Brewer, and D. Dardailler, eds. This document describes accessibility features in HTML 4.0.

[IBM-ACCESS]
"Software Accessibility," IBM Special Needs Systems.

[ICCCM]
"The Inter-Client communication conventions manual." A protocol for communication between clients in the X Window system.

[ICE-RAP]
"An ICE Rendezvous Mechanism for X Window System Clients," W. Walker. A description of how to use the ICE and RAP protocols for X Window clients.

[JAVA-ACCESS]
"IBM Guidelines for Writing Accessible Applications Using 100% Pure Java," R. Schwerdtfeger, IBM Special Needs Systems.

[JAVA-CHECKLIST]
"Java Accessibility Guidelines and Checklist," IBM Special Needs Systems.

[JAVA-TUT]
"The Java Tutorial. Trail: Creating a GUI with JFC/Swing." An online tutorial that describes how to use the Swing Java Foundation Class to build an accessible User Interface.

[MATHML]
"Mathematical Markup Language," P. Ion and R. Miner, eds., 7 April 1998, revised 7 July 1999. This MathML 1.0 Recommendation is http://www.w3.org/TR/1998/REC-MathML-19990707. The latest version of

MathML 1.0 is available at http://www.w3.org/TR/REC-MathML.

[MS-ENABLE]
"Accessibility for Applications Designers," Microsoft Corporation.

[MS-SOFTWARE]
"The Microsoft Windows Guidelines for Accessible Software Design." **Warning!** This is a "self-extracting archive", an application that will probably only run on MS-Windows systems.

[MSAA]
"Information for Developers About Microsoft Active Accessibility," Microsoft Corporation.

[NOTES-ACCESS]
"Lotus Notes Accessibility Guidelines," IBM Special Needs Systems.

[RDF10]
"Resource Description Framework (RDF) Model and Syntax Specification," O. Lassila, R. Swick, eds. The 22 February 1999 Recommendation is http://www.w3.org/TR/1999/REC-rdf-syntax-19990222. The latest version of RDF 1.0 is available at http://www.w3.org/TR/REC-rdf-syntax.

[RUBY]
"Ruby Annotation," M. Sawicki, M. Suignard, M. Ishikawa, and M. Dürst, eds. The 17 December 1999 Working Draft is http://www.w3.org/TR/1999/WD-ruby-19991217. The latest version is available at http://www.w3.org/TR/ruby.

[SEARCHABLE]
"A Comparison of Schemas for Dublin Core-based Video Metadata Representation," J Hunter.

[SMIL-ACCESS]
"Accessibility Features of SMIL," M.-R. Koivunen and I. Jacobs, eds. This W3C Note is http://www.w3.org/TR/1999/NOTE-SMIL-access-19990921. The latest version of Accessibility Features of SMIL is available at available at http://www.w3.org/TR/SMIL-access.

[SUN-DESIGN]
"Designing for Accessibility," Eric Bergman and Earl Johnson. This paper discusses specific disabilities including those related to hearing, vision, and cognitive function.

[SUN-HCI]
"Towards Accessible Human-Computer Interaction," Eric Bergman, Earl Johnson, Sun Microsytems 1995. A substantial paper, with a valuable print bibliography.

[SVG]
"Scalable Vector Graphics (SVG) 1.0 Specification (Working Draft)," J. Ferraiolo, ed. The latest version of the SVG specification is available at http://www.w3.org/TR/SVG.

[SVG-ACCESS]
"Accessibility of Scalable Vector Graphics (Working Draft)," C. McCathieNevile, M.-R. Koivunen, eds. The latest version is available at http://www.w3.org/1999/09/SVG-access.

[TRACE-REF]
"Application Software Design Guidelines," compiled by G. Vanderheiden. A thorough reference work.

[UAAG10]
"User Agent Accessibility Guidelines," J. Gunderson and I. Jacobs, eds. The latest version of the User Agent Accessibility Guidelines is available at http://www.w3.org/WAI/UA/UAAG10.

[UAAG10-TECHS]
"Techniques for User Agent Accessibility Guidelines 1.0," J. Gunderson, and I. Jacobs, eds. The latest version of Techniques for User Agent Accessibility Guidelines 1.0 is available at http://www.w3.org/TR/UAAG10-TECHS/.

[WAI-ER]
The Web Accessibility Initiative Evaluation and Repair Tools Working Group tracks and develops tools that can help repair accessibility errors.

[WCAG10]
"Web Content Accessibility Guidelines 1.0," W. Chisholm, G. Vanderheiden, and I. Jacobs, eds., 5 May 1999. This Recommendation is http://www.w3.org/TR/1999/WAI-WEBCONTENT-19990505. The latest version of the Web Content Accessibility Guidelines 1.0" is available at http://www.w3.org/TR/WCAG10/.

[WCAG10-TECHS]
"Techniques for Web Content Accessibility Guidelines 1.0," W. Chisholm, G. Vanderheiden, and I. Jacobs, eds. The latest version of Techniques for Web Content Accessibility Guidelines 1.0 is available at http://www.w3.org/TR/WCAG10-TECHS/.

[WHAT-IS]
"What is Accessible Software," James W. Thatcher, Ph.D., IBM, 1997. This paper gives a short example-based introduction to the difference between software that is accessible, and software that can be used by some assistive technologies.

[XHTML10]
"XHTML(TM) 1.0: The Extensible HyperText Markup Language (Working Draft)," S. Pemberton et al. The latest version of XHTML 1.0 is available at http://www.w3.org/TR/xhtml1.

[XML]
"The Extensible Markup Language (XML) 1.0," T. Bray, J. Paoli, C. M. Sperberg-McQueen, eds., 10 February 1998. This XML 1.0 Recommendation is http://www.w3.org/TR/1998/REC-xml-19980210. The latest version of the XML specification is available at http://www.w3.org/TR/REC-xml.

[XMLGL]
"XML Accessibility Guidelines (Draft Note)," D. Dardailler, ed. Draft notes for producing accessible XML document types. The latest version of the XML Accessibility Guidelines is available at http://www.w3.org/WAI/PF/xmlgl.

Level Double-A conformance icon, W3C-WAI Web Content Accessibility Guidelines 1.0