

Web Development

Lecture 19 – Accessibility

Web Design in a Nutshell 3ed
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Types of Disabilities

Vision impairment

- Fully blind
- Partially blind
- Colour blind

Mobility impairment

- No use of hands
- Partial use of hands

Auditory impairment

- Fully deaf
- Partially deaf

Cognitive impairment

- Memory loss
- Reading difficulty
- Mathematical reasoning

It is a **legal requirement** for organisations to ensure that their premises are accessible to wheelchair users

They must also ensure that their websites are accessible to people with disabilities.

Disability Discrimination Act
(1995)

Equality Act (2010)

Accessibility

There are a number of sets of guidelines which are designed to make websites more accessible to people with visual or hearing impairments.

Web Content Accessibility Guidelines (W3C)

<http://www.w3.org/WAI/intro/wcag>

Section 508 (US Government)

<http://www.section508.gov/index.cfm>

BS 8878: 2010 (BSI & Equality and Human Rights Commission)

[http://www.equalityhumanrights.com/footer/
accessibility-statement/general-web-accessibility-guidance/](http://www.equalityhumanrights.com/footer/accessibility-statement/general-web-accessibility-guidance/)

Most countries use a variation on the W3C guidelines.

They are also good rules to follow for general web design.

W3C WCAG

Version 1 published in 1999. Web design has changed a lot since then.

Version 2 became a WCAG recommendation on 11/12/08.

WCAG 2 is now approved as an ISO standard: ISO/IEC 40500:2012.

There are four principles, and each principle is broken down into guidelines.

Each guideline has success criteria specified for it, and also a set of techniques are given which can be used by designers to ensure that the criteria is met.

- Level A – **Must** conform to specification
- Level AA – **Should** conform to specification
- Level AAA – **May** conform to specification

WCAG 2.0 Guidelines

1 Perceivable

- 1.1 Provide text alternatives for any non-text content so that it can be changed into other forms people need, such as large print, braille, speech, symbols or simpler language.
- 1.2 Provide alternatives for time-based media.
- 1.3 Create content that can be presented in different ways (for example simpler layout) without losing information or structure.
- 1.4 Make it easier for users to see and hear content including separating foreground from background.

2 Operable

- 2.1 Make all functionality available from a keyboard.
- 2.2 Provide users enough time to read and use content.
- 2.3 Do not design content in a way that is known to cause seizures.
- 2.4 Provide ways to help users navigate, find content, and determine where they are.

3 Understandable

- 3.1 Make text content readable and understandable.
- 3.2 Make Web pages appear and operate in predictable ways.
- 3.3 Help users avoid and correct mistakes.

4 Robust

- 4.1 Maximize compatibility with current and future user agents, including assistive technologies.

Guideline 1.1 Text Alternatives:

Provide text alternatives for any non-text content so that it can be changed into other forms people need, such as large print, braille, speech, symbols or simpler language.

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

Controls, Input: If non-text content is a control or accepts user input, then it has a name that describes its purpose. (Refer to Guideline 4.1 for additional requirements for controls and content that accepts user input.)

Time-Based Media: If non-text content is time-based media, then text alternatives at least provide descriptive identification of the non-text content. (Refer to Guideline 1.2 for additional requirements for media.)

Test: If non-text content is a test or exercise that would be invalid if presented in text, then text alternatives at least provide descriptive identification of the non-text content.

Sensory: If non-text content is primarily intended to create a specific sensory experience, then text alternatives at least provide descriptive identification of the non-text content.

CAPTCHA: If the purpose of non-text content is to confirm that content is being accessed by a person rather than a computer, then text alternatives that identify and describe the purpose of the non-text content are provided, and alternative forms of CAPTCHA using output modes for different types of sensory perception are provided to accommodate different disabilities.

Decoration, Formatting, Invisible: If non-text content is pure decoration, is used only for visual formatting, or is not presented to users, then it is implemented in a way that it can be ignored by assistive technology.

Guideline 2.3 Seizures:

Do not design content in a way that is known to cause seizures.

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

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

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

http://www.w3.org/WAI/WCAG20/quickref/

Quick Reference Checklist

The screenshot shows the W3C Web Accessibility Initiative Quick Reference page. The browser address bar displays 'www.w3.org/WAI/WCAG20/quickref/'. The page title is 'How to Meet WCAG 2.0' and the subtitle is 'A customizable quick reference to Web Content Accessibility Guidelines 2.0 requirements (success criteria) and techniques'. The page is divided into two main sections: 'Introduction' and 'Customize this Quick Reference'. The 'Introduction' section contains a '[Hide Introduction]' link and text explaining the document's purpose. The 'Customize this Quick Reference' section includes checkboxes for 'Technologies', 'Levels', 'Sections', and a 'Save Settings Option'. A 'Customize with Settings Above' button is at the bottom of the customization panel.

W3C Web Accessibility initiative

How to Meet WCAG 2.0

A customizable quick reference to Web Content Accessibility Guidelines 2.0 requirements (success criteria) and techniques

Introduction

[\[Hide Introduction\]](#)

This document lists all of the requirements (called "success criteria") from [Web Content Accessibility Guidelines \(WCAG\) 2.0](#). It also lists techniques to meet the requirements, which link to more details. The "Understanding" links go to descriptions, examples, and resources.

You can customize the list by selecting the technologies that apply to your Web project, and the [levels](#) and techniques that you want included in the list.

Technology-specific techniques do not supplant the general techniques: content developers should consider both general techniques and technology-specific techniques as they work toward conformance.

Note: In some customized views, no techniques will be listed under some headings. This indicates that there are no documented techniques for the technologies chosen.

See the [WCAG Overview](#) for an introduction to WCAG and supporting documents, including more information about this document.

About the Techniques

Note that all techniques are [informative](#) - you don't have to follow them. The "sufficient techniques" listed below are considered sufficient to meet the success criteria; however, it is not necessary to use these particular techniques. Anyone can [submit new techniques](#) at any time. If techniques are used other than those listed by the Working Group, then some other method for establishing the technique's ability to meet the success criteria would be needed.

Customize this Quick Reference

Technologies:

- ☒ Show HTML techniques and failures
- ☒ Show CSS techniques and failures
- ☒ Show SMIL techniques and failures
- ☒ Show Client-side Scripting techniques and failures
- ☒ Show Server-side Scripting techniques and failures
- ☒ Show Flash techniques and failures
- ☒ Show PDF techniques and failures
- ☒ Show Silverlight techniques and failures
- ☒ Show WAI-ARIA techniques and failures

Levels:

- ☒ Show Level A Success Criteria
- ☒ Show Level AA Success Criteria
- ☒ Show Level AAA Success Criteria

Sections:

- ☒ Show Sufficient Techniques and Failures
- ☒ Show Advisory Techniques

Save Settings Option:

☐ Save these settings (requires cookies)

[Customize with Settings Above](#)

Section 508 (US Government Rules)

A set of rules (a) to (p) that are similar to the W3C guidelines.

(a) A text equivalent for every non-text element shall be provided (e.g., via "alt", "longdesc", or in element content).

(b) Equivalent alternatives for any multimedia presentation shall be synchronized with the presentation.

(c) Web pages shall be designed so that all information conveyed with color is also available without color, for example from context or markup.

(d) Documents shall be organized so they are readable without requiring an associated style sheet.

(e) Redundant text links shall be provided for each active region of a server-side image map.

BS 8878:2010 (British Standards Institute)

This is a more general document - targeted more at the manager who is employing someone else to design the website.

Contents include:

1. Terms and definitions
2. General principals
3. How disabled people use websites
4. Defining the accessibility policy for the website
5. Web technologies
6. Accessibility testing and maintenance
7. Contracting web design and accessibility auditing services.

http://www.w3.org/WAI/Policy/

The screenshot shows the W3C Web Accessibility Initiative (WAI) website. The browser address bar displays 'www.w3.org/WAI/Policy/#US'. The page features a navigation menu on the left with links such as 'Getting Started', 'Designing for Inclusion', 'Guidelines & Techniques', 'Planning & Implementing', 'Evaluating Accessibility', 'Presentations & Tutorials', and 'Getting Involved with WAI'. The main content area is titled 'Policies Relating to Web Accessibility' and includes a list of countries on the page: AU, CA, CH, DE, DK, ES, EU, FI, FR, HK, IL, IN, IT, JA, NZ, PT, UK, US. It also contains sections for 'Disclaimer', 'Status and Updates', and 'Contents'. The 'Contents' section lists various countries and regions, including Australia, Canada, Denmark, European Union, Finland, France, Germany, Hong Kong, India, Ireland, Israel, Italy, Japan, New Zealand, Portugal, Spain, Switzerland, United Kingdom, and United States of America. A sidebar on the right contains a 'Page Contents' section with links to 'Disclaimer', 'Status and Updates', 'Contents', 'Introduction', and 'Other Countries?'.

Links to Web Accessibility resources for other countries

Example of good practice

Instructions

Reader

Colour

Text Size

Breadcrumb Trail

The screenshot shows a Microsoft Internet Explorer browser window displaying the 'Website accessibility guidance' page on the Equality and Human Rights Commission website. The browser's address bar shows the URL: <http://www.equalityhumanrights.com/en/publicationsandresources/Disability/Pages/Websiteaccessibilityguidance.aspx>. The website header includes the 'Equality and Human Rights Commission' logo and navigation links like 'Home', 'About us', 'Your rights', 'For advisers', 'For businesses and organisations', and 'News and comment'. A search bar is located in the top right corner. The main content area features a breadcrumb trail: 'You are here: Home > Publications and resources > Disability > Website accessibility guidance'. Below this, the title 'Website accessibility guidance' is prominently displayed. The page lists three downloadable resources: 'Making websites that are easy for everyone to use' (PDF, 371kb, 54 seconds @56K), 'The web, access and inclusion for disabled people' (RTF, 142kb, 20 seconds @56K; PDF, 406kb, 59 seconds @56K), and 'Website accessibility guidance PAS78 (BSI publicly available specification)' (RTF, 354kb, 51 seconds @56K; Word, 231kb, 33 seconds @56K; PDF, 821kb, 2 minutes @56K). A left-hand navigation menu is visible, with 'Disability' highlighted under the 'Publications and resources' section. The browser's status bar at the bottom indicates 'Done' and 'Internet'.

Reader

Read Links

Go to Link

Settings

The screenshot shows a Microsoft Internet Explorer browser window displaying the Equality and Human Rights Commission website. The ReadSpeaker XT toolbar is overlaid on the browser interface. The toolbar includes a menu with 'Read Text', 'Read Links', and 'Stop'. It also features a search bar with a 'Go' button, a 'Link name/number' field, and a 'Go to' button. Additional controls include 'Settings' and 'Help' buttons, a 'Change colour' section with five color swatches (blue, yellow, orange, green, black), and a 'Text' section with 'Text smaller', 'Text standard', and 'Text larger' options. The website content shows the 'Accessibility' page, with a sidebar menu containing links like 'Home', 'About us', 'Your rights', 'For advisers', 'For businesses and organisations', 'News and comment', 'Publications and resources', and 'Adnoddau Cymraeg'. The main content area includes a 'You are here' breadcrumb, a heading 'Accessibility', a paragraph about the website's accessibility features, and a section 'On this page' with a sub-heading 'Help with understanding the information' and a bullet point about the writing style.

Accessibility -- ReadSpeaker XT - Microsoft Internet Explorer

File Edit View Favorites Tools Help

Back Forward Stop Reload Home Search Favorites

Address <http://asp.readspeaker.net/cgi-bin/rsxt/8017623213350449/start/en/http://www.equalityhumanrights.com/en/Pages/Accessibility.aspx> Go

abc www Hand

Read Text Read Links Stop

Link name/number Go to

Settings Help

Accessibility Listen Change colour: C C C C C Text smaller | Text standard | Text larger

Search Enter keywords Search options Login Print this page

Home About us Your rights For advisers For businesses and organisations News and comment Publications and resources Adnoddau Cymraeg

Equality and Human Rights Commission

You are here: Home >

Accessibility

Our website has been built with findability, accessibility and usability in mind, so we hope you can find, access and use the information you need. This page explains the accessibility features available on the web site. We are always happy to receive feedback via the helpline about accessibility on the web site.

On this page

Help with understanding the information

- Our writing style presents information in plain and simple language

ReadSpeaker XT

Done Internet

Official guidelines often tell you what you should do, but not necessarily how you should do it.

The W3C guidelines are the exception - they contain good advice to the web designer about techniques - with examples.

There follows a general set of rules which you try to keep in mind when designing websites.

1. Use Meaningful Mark-up

Use HTML tags to describe meaning, not appearance.

`<h1>Introduction</h1>`

indicates that the text is a heading

You can associate any fontsize, color etc with `<h1>` in the stylesheet.

The elements or attributes that have been deprecated are the ones that used to be used for controlling appearance

`<bold>` `<underline>` ``

Example of a tag in use

<p>

Call me on 12345 now.

</p>

I can then set up a style sheet which will give a uniform appearance to all phone numbers – or all numbers that I have marked up as phone numbers.

2. Provide Alternatives

Use of the alt attribute.

```

```

will:

- cause a tooltip to pop up when the mouse is over the image
- cause the text to appear if the image cannot load
- enable reader software to describe the image to a blind person

Also

- Provide transcripts for audio files.
- Provide captions for video files.

This will not only benefit people with sight and hearing impairments, but also people who are still using dial-up.

3. Remember that Order Counts

A logical order within the page makes it a lot easier to understand.

Screen readers tend to read things in the order of the source code.

Make sure that it applies to not just the entire page, but to things within the page – groups of links, form fields.

What does your page look like with the styles turned off?

4. Test Your Javascript

Some people often have Javascript switched off.

Test your page with Javascript support turned on and turned off.

Can the user still use your website?

If your menu or navigation system relies on Javascript, have you provided an alternative?

5. Make it Easy to Move Around the Page

Make use of anchor points within a page

```
<a id="para3">Course List</a>
```

```
<h1 id="para5">Student List</h1>
```

and then you can provide links to them from elsewhere in the page:

```
<a href="#para3">Go to Course List</a>
```

```
<a href="#para5">Go to Student List</a>
```

6. Make It Clear Which Page Element Has Focus

Use the focus state for links.

This enables the link to change colour when it is selected or has focus. Put the following in the stylesheet.

```
a:link
{
color: #000000;
background-color: #ffffff;
}
```

```
a:hover
{
color: #ffffff;
background-color: #000000;
}
```

To provide the same feedback for people who are using the keyboard / tab key:

```
a:focus
{
color: #ffffff;
background-color: #000000;
}
```

Internet Explorer doesn't recognise focus – use the following instead.

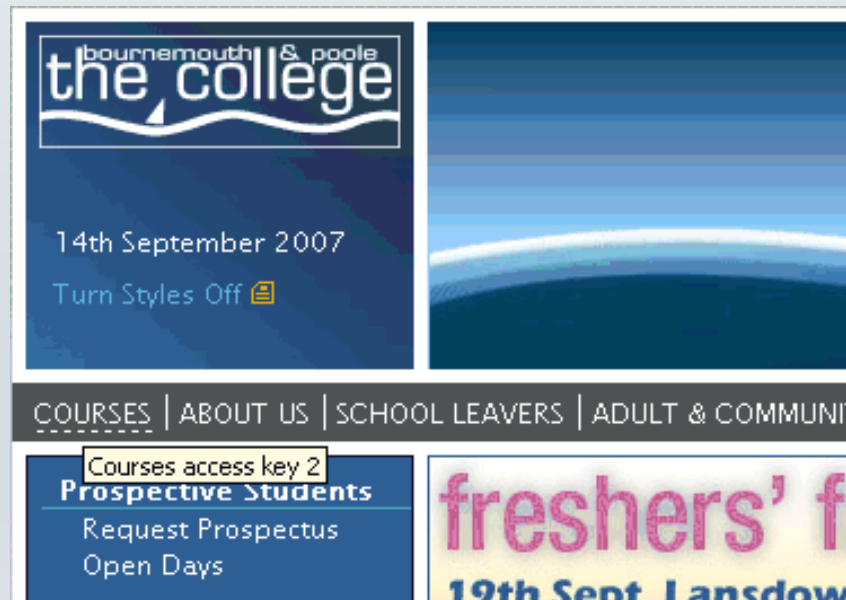
```
a:active
{
color: #ffffff;
background-color: #000000;
}
```

7. Provide Keyboard Alternatives to Mouse Use

Use the accesskey attribute

```
<input type="text" name="address" accesskey="2">
```

will enable you to select that text box by typing Alt-2. You can also use it on other elements.



tabindex

Another way of changing focus without using a mouse is to use the tab key.

If you want to change the default tab order, you can use the tabindex attribute.

User ID: `<input type="text" name="login" tabindex="3"/>`

Password: `<input type="text" name="Pass" tabindex="2" />`

Postcode: `<input type="text" name="Postcode" tabindex="1"/>`

8. Handle Colours Carefully

Declare your colours in pairs (foreground and background).

Do so only in CSS.

Don't declare the foreground colour in CSS and the background colour in the HTML.

The stylesheet may be switched off, or not supported, or overridden by the user.

Provide alternative stylesheets for the same page to help people with colour blindness.

Colour contrast analysers are available at:

<http://juicystudio.com/services/colourcontrast.php>

9. Use Well-Formed XHTML

- All lower case element and attribute names.
- Quoted Attribute Values (even single words and numbers).
- Always terminate elements.
 - Even empty elements. (`
` or `
</br>`)
- Explicit attribute values (`checked="checked"`).
- Make sure that all elements are nested correctly.
- Use the id attribute in preference the name attribute.
- Place CSS and Scripts in their own files.

Testing for Accessibility

Web Developer Toolbar for Firefox

- Provides a set of tools which include some that can be used to test for accessibility.

Accessibility Toolbar for Internet Explorer

- See WAT-C website

Opera Browser

- Includes quick access to various browser modes. Also includes voice recognition and speech capabilities built into the browser.

WAT-C Online tools

- Web Accessibility Tool Consortium - set of free tools that can be used for testing websites (<http://www.wat-c.org/>)

http://www.w3.org/WAI/ER/tools

The screenshot shows a web browser window displaying the 'Web Accessibility Evaluation Tools List' page from the W3C. The page has a blue header with the W3C logo and 'Web Accessibility initiative'. Below the header, there's a paragraph explaining the purpose of the tools and a link to 'Selecting Web Accessibility Evaluation Tools'. A disclaimer follows, stating that W3C does not endorse specific products. On the left, there's a 'Filters' section with expandable categories: 'Guidelines' (listing WCAG 2.0, WCAG 1.0, BITV, RGAA, JIS, Irish National IT, Section 508, and Stanca Act), 'Languages', 'Type of tool', 'Assists by ...', 'Automatically checks...', and 'License'. The main content area, titled 'Results: Showing 48 tools', lists three tools: '508 Checker by Formstack', 'A-Tester by Evaluera Ltd', and 'A11Y Compliance Platform by Bureau of Internet Accessibility'. Each tool entry includes a brief description, a link to the tool's website, and a link to 'Detailed Information'.

Web Accessibility Evaluation Tools List

Web accessibility evaluation tools are software programs or online services that help you determine if web content meets accessibility guidelines. This page provides a list of evaluation tools that you can filter to find ones that match your particular needs. To determine what kind of tool you need and how they are able to assist you, see [Selecting Web Accessibility Evaluation Tools](#).

Information on this page is provided by vendors and others. W3C does not endorse specific products. See [Important Disclaimer](#).

▼ Filters:

- ▼ Guidelines
 - ☐ WCAG 2.0 — W3C Web Content Accessibility Guidelines 2.0 (38 tools)
 - ☐ WCAG 1.0 — W3C Web Content Accessibility Guidelines 1.0 (16 tools)
 - ☐ BITV, German government standard (1 tool)
 - ☐ RGAA, French government standard (6 tools)
 - ☐ JIS, Japanese industry standard (1 tool)
 - ☐ Irish National IT Accessibility Guidelines (1 tool)
 - ☐ Section 508, US federal procurement standard (14 tools)
 - ☐ Stanca Act, Italian accessibility legislation (3 tools)
- Languages
- Type of tool
- Assists by ...
- Automatically checks...
- License
- ☐ Tools providing

Results:

Showing 48 tools

508 Checker by Formstack

With 508checker.com you can quickly check a webpage for 508 compliance and learn more about how to become 508 compliant across your entire organization <http://www.508checker.com>, Version: 1.4, Released: 2014-Jun-01

► Detailed Information about "508 Checker"

A-Tester by Evaluera Ltd

A-Tester checks the pre-enhanced version of a web page designed with progressive enhancement against Evaluera's "WCAG 2.0 Level-AA conformance statements for HTML5 foundation markup" making a report that can serve as a broad and easily confirmed WCAG 2.0 Level-AA claim, even for enhanced versions. <http://www.evaluera.co.uk>, Released: 2014-May-28

► Detailed Information about "A-Tester"

A11Y Compliance Platform by Bureau of Internet Accessibility

Tools, reports and services to help organizations achieve, maintain and defend the accessibility of their organization's websites. Standards and guidelines used includes Section 508, Web Content Accessibility Guidelines (WCAG) & Americans with Disabilities (ADA) <http://www.boia.org?wc3>, Version: Version 5 Release 3.4, Released: 2014-Nov-13

► Detailed Information about "A11Y Compliance Platform"