Website Accessibility Testing
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1. Overview

This document describes accessibility testing – what it is and a checklist of core aspects to test for.

Accessibility testing focuses on how people with disabilities use websites both on standard computers and mobile devices and to allow those with disabilities to use those websites with equal access to information and functionality as users without disabilities. Disabilities include visual or hearing impairment, motor impairment, seizures, or cognitive disabilities such as dyslexia or dyscalculia.

Websites should meet the standards to enable all users to access the information within them. These are defined in the following UK legislation and complemented by online resources:

- The Disability Discrimination Act 1995
- Special Educational Needs and Disability Act 2001
- Equality Act 2010
- World Wide Web Consortium (W3C) – http://www.w3.org/standards/webdesign/accessibility
- British Computer Society Disability Group – http://www.bcs.org/category/18035

Testers should encourage business analysts to include accessibility requirements (hardware and software) in the appropriate documentation (e.g. Business Requirements documents, user story, function specification, etc.) early on in the delivery lifecycle. This embeds accessibility as part of the main delivery lifecycle and means that testers can write test cases against agreed functionality rather than an abstract checklist.

The W3C guidelines state that the "guidelines and success criteria are designed to be broadly applicable to current and future web technologies, including dynamic applications, mobile, digital television, etc. They are stable and do not change." Therefore this document does not distinguish between device types as the same tests should be run on multiple device types and requirement documentation should specify if functionality or accessibility differs between device types.

By identifying the requirements early on in the delivery lifecycle there is a better chance of succeeding in delivering a website that meets the W3C criteria. This includes fulfilling the primary recommendation of using real users with disabilities to test the website under development but this is not always feasible, usually on time and cost grounds.

Ultimately test organisations such as Sogeti will be constrained by what the client delivers for testing and the boundaries placed on testing, e.g. device availability, cost of testing.

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2. Hardware

Some aspects of accessibility will be based on what hardware users are using to access the websites under test. As this can vary widely it is not possible for suppliers or testing organisations to test every variant. This is where user testing is desirable as you can obtain a wide variety of users with differing hardware. The list below is not exhaustive.

- What is used to access the website – PC? Laptop? Tablet? Mobile?
- What keyboard type – Ergonomic? Standard? Wrist Rests? Overlay?
- What mouse – Trackball? Standard? No Mouse?

3. Software

Software considerations for accessibility testing are also significant. As with standard website testing it is difficult to get coverage of all variants of browsers and versions during testing plus additional assistive technology can be used such as those listed below.

- Braille terminals
- Speech recognition
- Screen readers
- Screen Magnification
- Access to subtitles or sign language videos

As for testing for standard users, testers should assess the website under test to see what coverage can be achieved during the available testing window.

4. Areas to consider for delivery

The information below is taken from the W3C website and are numbered as per version 2.0 of the guidelines (http://www.w3.org/TR/UNDERSTANDING-WCAG20/). The checklist in section 5 cross references to the guideline numbering used below.

The individual success criteria for each guideline listed below meet three rating standards: A, AA or AAA. "A" is the minimum suggested standard by W3C.

1.1 Text Alternatives

Where non-text content exists such as user input, multimedia, and so on, the content can be presented in alternative ways such as subtitles for videos.

1.2 Time Based Media

Time based media is audio and/or visual information on a website. It can be presented in alternative ways such as audio description, captions, or sign language alternatives.

1.3 Adaptable

Ensures that information and structure can be separated from how that information is presented. For example that any information conveyed by colour is also visually evident without colour.

1.4 Distinguishable

Ensures that foreground information is easily distinguishable from background information such as turning off background audio or text and background having a luminosity contrast ration of at least 10:1.

2.1 Keyboard Accessible

Ensures that all functionality of the content is usable through a keyboard interface and not reliant on use of a mouse.

2.2 Enough Time

Where there is a time-out that is a function of the content that there are ways to turn off or adjust the time out.

2.3 Seizures

Allow users to avoid content that could cause seizures due to photosensitivity.

2.4 Navigable

Provide mechanisms to help users find content, orient themselves within it, and navigate through it.

3.1 Keyboard Accessible

Allow users to read text content either themselves or via assistive technology.

3.2 Predictable

Content should be in a predictable order from page to page and the behaviour of functional and interactive components should be predictable.

3.3 Input Assistance

Ensures users can detect where they have entered invalid information in a page.

4.1 Compatible

Ensure compatibility with current and future assistive technologies, for example by following best practice mark up.

5. Manual Test Acceptance Criteria

The list below has been created from the W3C website to act as a checklist for manual accessibility testing. The list does not include every Success Criteria on the W3C website but instead lists all "A" rating criteria. It is recommended that if you are using this document as a checklist for accessibility testing that if you have time to perform further accessibility testing than that listed below that you check the W3C website for further tests to go beyond the "A" rating to achieve "AA" or "AAA" rating.

It is possible to use software that will assess the accessibility of the website automatically and these could be utilised as part of an automation pack or as part of build processes. However automated tools should not be used as a means of testing accessibility in isolation (see this link http://www.standards-schmandards.com/2009/pitfalls-of-web-accessibility-evaluation-tools/). Appropriate comments have been added where relevant for criteria that could be well suited for using automated checking software.

W3C Guideline	Sub criteria	Related criteria (AA or AAA)	Success Criteria	Suggested Tests
1.1	1.1.1	None	For all charts, diagrams, audio recordings, pictures, and animations, text alternatives can make the same information available in a form that can be rendered through any modality (for example visual, auditory or tactile)	1. Links available for alternatives. 2. If the information is non-text then text alternatives should be provided such as subtitles for videos. 3. If there is a test or exam provided in non-text then text alternatives should, at a minimum, describe the non-text content (it may not be possible to perform the test or exam in a text format).
1.1	1.1.1	None	For all images used as submit buttons, image maps or complex animations a name is provided to describe the purpose of the non-text content	1. Hover over buttons/image and meaningful text displays

W3C Guideline	Sub criteria	Related criteria (AA or AAA)	Success Criteria	Suggested Tests
1.1	1.1.1	None	If the purpose of non-text content is to confirm that content is being accessed by a person rather than a computer (usually called CAPTCHA), then text alternatives that identify and describe the purpose of the non-text content are provided along with alternatives for outputting the CAPTCHA.	1. At least two options for CAPTCHA are available - one text and one non-text
1.2	1.2.1/1.2.3	1.2.5/1.2.7/1.2.8/1.2.9	Audio only, video only or multimedia have alternatives available.	1. There should be alternatives that provide the equivalent information. This may be text based versions of the audio or video or audio description for video.
1.2	1.2.2	1.2.4/1.2.6	Captions are provided for all pre-recorded audio content except when the media is a media alternative for text and is clearly labelled as such.	1. Text available for all audio content
1.3	1.3.1/1.3.2	None	Information, structure, and relationships and sequences conveyed through presentation can be programmatically determined or are available in text.	1. If using a screen reader then all pages can be read 2. Labels for required fields are in red with a * for mandatory fields with relevant instructions 3. In a multi-column document, the linear presentation of the content flows from the top of a column to the bottom of the column, then to the top of the next column. 4. Checkboxes in a form have clear labels so that assistive technology can interpret the labels.
1.3	1.3.3	None	Instructions provided for understanding and operating content do not rely solely on sensory characteristics of components such as shape, size, visual location, orientation, or sound	1. Labels for required fields are in red with a * for mandatory fields with relevant instructions Shaped/coloured buttons have clear labels, e.g. "Next". 2. A multi-page form has the NEXT button clearly

W3C Guideline	Sub criteria	Related criteria (AA or AAA)	Success Criteria	Suggested Tests
				labelled and clear instructions as to what NEXT does.
1.4	1.4.1	1.4.3/1.4.4/1.4.5/1.4.6/1.4.9	Colour is not used as the only visual means of conveying information, indicating an action, prompting a response, or distinguishing a visual element	1. Text and colour used to identify required fields 2. Diagrams have text associated to describe them 3. Fields not required/disabled are made inactive by the user agent (or browser) so assistive technologies can identify that the field isn't required
1.4	1.4.2	1.4.7/1.4.8	If any audio on a Web page plays automatically for more than 3 seconds, either a mechanism is available to pause or stop the audio, or a mechanism is available to control audio volume independently from the overall system volume level so that users can continue to use screen reading technologies.	1. The user stops audio playing on a web page
2.1	2.1.1	2.1.3	All functionality of the content is operable through a keyboard interface without requiring specific timings for individual keystrokes.	1. Page can be navigated through keyboard only
2.1	2.1.2	2.1.3	Ensure that content does not "trap" keyboard focus within subsections of content on a web page.	1. Page can be navigated through keyboard only including exiting from a subsection of a website, such as a calendar widget, with instructions if needed.
2.2	2.2.1	2.2.3	For each time limit set by the content the user can do at least one of the following - Turn off, adjust, extend. Exceptions allowed for real time events or emergencies, e.g. an online auction	1. Time can be turned off, adjusted or extended

W3C Guideline	Sub criteria	Related criteria (AA or AAA)	Success Criteria	Suggested Tests
2.2	2.2.2	2.2.4/2.2.5	Ensure all moving, blinking or auto-updating information can be paused, stopped or hidden	1. Content can be paused, stopped or hidden
2.3	2.3.1	2.3.2	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.	1. Check the page for flashing images. It may be possible to use automated tools but at this time no tools have been identified.
2.4	2.4.1	2.4.5	Allow people who navigate sequentially through content more direct access to the primary content of the web page	1. Primary content can be accessed by keyboard short cut
2.4	2.4.2	2.4.10	Ensure web pages have meaningful and descriptive title	1. Web page title describes function/purpose of page
2.4	2.4.3	2.4.6/2.4.7/2.4.8	Ensure that when users navigate sequentially through the content they encounter information in an order that is consistent with the meaning of the content and can be operated from the keyboard	1. Tab works and takes the user through the content in a logical order
2.4	2.4.4	2.4.9	Ensure each link has meaningful and identifiable description	1. Link has meaningful name or description
3.1	3.1.1	3.1.2/3.1.3/3.1.4/3.1.5/3.1.6	The default human language of each Web page or part of page can be programmatically determined so that assistive technology can render text more accurately in the correct language	1. Using the user agent (or browser) settings check the language set in the html lang tag. For example in internet explorer select settings, F12 Developer tools and html to view the lang tag.
3.2	3.2.1/3.2.2	3.2.3/3.2.4/3.2.5	When any user interface component receives focus, it does not initiate a change of context unless the user is informed, e.g. form does not automatically submit when SUBMIT receives focus unless the user is advised that focussing on submit	1. User has to select submit, e.g. by hitting enter if using keyboard only, rather than just focussing on submit (for example using the tab key)

W3C Guideline	Sub criteria	Related criteria (AA or AAA)	Success Criteria	Suggested Tests
			means a form will submit	
3.3	3.3.1	3.3.3/3.3.4/3.3.6	If an input error is automatically detected, the item that is in error is identified and the error is described to the user in text.	1. Messages displayed with more than one cue (e.g. text and colour) that input was incorrect
3.3	3.3.2	3.3.5	Labels or instructions are provided when content requires user input. Examples: • Date field has correct format label (DD/MM/YYYY) • US State has link to alphabetised list of states and correct abbreviations	1. Labels/instructions provided when user input required.
4.1	4.1.1	None	In content implemented using mark-up languages, elements have complete start and end tags, elements are nested according to their specifications, elements do not contain duplicate attributes, and any IDs are unique. This allows assistive technologies to accurately interpret content	1. This is best done by Web Developers who should be using best practice. However there are tools to check code against W3C standards, some of which are free. Two examples are http://validator.w3.org/ and http://www.freeformatter.com/html-validator.html

W3C Guideline	Sub criteria	Related criteria (AA or AAA)	Success Criteria	Suggested Tests
4.1	4.1.2	None	For all user interface components (including but not limited to: form elements, links and components generated by scripts), the name and role can be programmatically determined; states, properties, and values that can be set by the user can be programmatically set; and notification of changes to these items is available to user agents (or browsers), including assistive technologies. This success criterion is primarily for Web authors who develop or script their own user interface components. For example, standard HTML controls already meet this success criterion when used according to specification.	1. Web Developers should advise if user interface components have been developed. If so then criteria 4.1.2 (http://www.w3.org/TR/UNDERSTANDING-WCAG20/ensure-compat-rsv.html) should be reviewed with developers to ensure the changes have not violated this criterion. At the time of writing no tools have been identified to test this criterion.

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