Digital Government Authority
هيئة الحكومة الرقمية

The Guideline for Web Accessibility of Government Websites

2022

Document Type: Guideline

Document classification: Public

Issue No: 1.0

Document No: DGA-1-2-4-203

Table of Content

1. Introduction

The Digital Government Authority attaches high importance to the web accessibility of digital platforms and products of government agencies due to the importance of enabling all segments of society, including disabled and elderly people, to access content and benefit from it. This will positively impact the final product and target audience.

In addition, the DGA is interested in providing digital government products and increasing the quality to promote the participation and awareness-raising principle. Therefore, the guideline was prepared to boost the implementation of by presenting Web Content Accessibility Guidelines (WCAG) 2.1 in terms of definition and implementation of the guidelines created by the World Wide Web Consortium (W3C) and illustrative examples.

2. Table of Definitions

Term	Definition
DGA	Digital Government Authority
Government Entities	Ministries, authorities, public institutions, councils, national centers including any additional form of a public entity.
Digital Government	Promotes administrative, organizational and operational processes between the various government entities in their transitioning to a comprehensive digital transformation to allow easy and effective access to government digital information and services.
Beneficiary	Citizens, residents, visitors, government agencies, private sector, not-for-profit sector, inside or outside the KSA that require to interact with a government entity to receive any of the services offered in the Kingdom.
Guidelines	Provides examples showing the implementation mechanism of the of policies and standards in place.
Vision Disability	People with no vision or people with low visual impairment or poor color vision.
Hearing Disability	People who are not able to hear sounds due to different reasons. It varies based on the medical case.
Motor Disability	People who lost their ability to move their bodies or part of their bodies due to muscle weakness or lack of control.
Cognitive Disability	People who have certain limitations in mental functioning and skills such as communication, self-help, and social skills.
Accessibility	Accessibility ensures everyone can use the service. It covers inclusiveness, accessibility, equity, and W3C accessibility guidelines.
User Experience (UX)	It is the process design teams use to create products that provide meaningful and relevant experiences to users. This involves the design of the entire experience, including aspects of value proposition, function, content, navigation, usability, branding, and design.

2. Table of Definitions

Term	Definition
User Interface (UI)	Design elements used in building software and computerized devices interfaces based on user needs to enable them to interact with the system -easy accessing, understanding and using those elements easily-, and facilitate actions. (UI) brings together concepts from interaction design, visual design, and information architecture.
Usability	Usability refers to the quality of a user's experience when interacting with products or systems, including websites, software, devices, or applications. It is about effectiveness, efficiency and the overall satisfaction of the user.
World Wide Web Consortium (W3C)	The World Wide Web Consortium (W3C) is an international community that develops web standards and facilitates interoperation to ensure the long-term growth of the web.
Web Accessibility Initiative (WAI)	It develops web accessibility guidelines, technical specifications, and educational resources to help make the web accessible to people with disabilities.
Web Content Accessibility Guidelines (WCAG)	It is developed through the W3C process in cooperation with individuals and organizations around the world, with a goal of providing a single shared standard for web content accessibility that meets the needs of individuals, organizations, and governments internationally.
Website	Non-interactive web pages that provide information and news content available to everyone without need log in to the website. It can also demonstrate the available service and products catalog, but without the ability to request them, meaning that they are non-interactive services.
Informative Content	Information that the government agency publishes through its digital channels to give an overview of the agency and what it does, such as: Its latest news, its initiatives and its mechanism of action.

3. Guideline Objectives

The guideline aims to improve the user experience and enable all segments of society, including people with disabilities and the elderly, to access the content of government websites facilely, which will be positively reflected in enabling digital transformation and increasing user satisfaction with government services.

4. Guideline Scope

Illustrates the most significant recommendations thatRelated to accessibility standards aim to improve the user experience and raise the usability level of digital government portals to all segments of society, including disabled people.

5. Target Audience

The guideline is addressed to user interface designers, website and applications developers, and content managers to make the web content accessible by a diversity of users. This user guide can also be a source to guide other audiences who are interested in web accessibility.

6. Guideline Statement

6.1 Accessibility Guidelines

Web Content Accessibility Guidelines 2.1 (WCAG) has been used since it is an international standard. Each level of the priorities has a set of standards distributed into a checklist based on the WCAG priority levels to make implementation easy for the developers of government websites and compliance with them in developing and improving government sites and platforms.

6.1.1 WCAG Checklist Level A:

Level A is the minimum level and includes the most basic web accessibility features. A web content developer shall satisfy this checkpoint. Otherwise, one or more groups will find it impossible to access information in the document.

Guidelines	Summary
1.1.1 Non-text Content	**Provide text alternatives for non-text content that serves the same purpose by using "alt" to describe the image, "name" to describe the control and input fields, text transcript to explain the audio or text transcript, or audio-track to describe a video content.** Users who cannot see images, hear audio or perceive video benefit from having text alternatives in their place. These can be read by the user or voiced by assistive technology like a screen reader.
1.2.1 Audio-only and Video-only (Pre-recorded)	
1.2.2 Captions (Pre-recorded)	**Provide captions for videos with audio and for non-speech information (such as sound effects).** Users with hearing impairments may not be able to perceive the sound on a video. Presenting the video's content in captions means these users can fully enjoy the content.
1.2.3 Audio Description or Media Alternative (Pre-recorded)	**Provide audio description or text transcript for videos with sound.** Users who are blind or visually impaired need alternatives for video content.

Guidelines	Summary
1.3.1 Info and Relationships	**Content, structure, and relationships can be programmatically determined. By using the correct HTML elements to structure the information of web content, provide text transcripts and clear labels of input forms.** All users benefit when the website structure is logical, and each section of content has a clear relationship with the content around it. Visual cues like headings, bullet points, line breaks, tables, bolding, underlining links and other formatting choices help users understand the content.
1.3.2 Meaningful Sequence	**The reading and navigation order (determined by code order) is logical and intuitive.** Users, who rely on assistive technology (such as a screen reader) to interpret content, require content to be presented in a meaningful order. If this is presented out of sequence, users may become disorientated and may not understand the content. For example, we read from left to right in English and read a left-hand column before a right-hand column.
1.3.3 Sensory Characteristics	**Instructions do not rely solely on sensory characteristics.** Blind or visually impaired users who rely on sensory characteristics only (shapes, sounds, positioning, orientation, sound, color, and size) may not understand instructions of web content. So, providing additional information to any instructions other than sensory characteristics will help users recognizing the instructions better.
1.4.1 Use of Color	**Color is not used as the only visual means of conveying information, indicating an action, prompting a response, or distinguishing a visual element. Another mean should be provided.** It is solved by using other identifiers such as labels, shapes, and patterns.
1.4.2 Audio Control	**Do not play audio automatically as it can distract and disorientate users. And provide control tools such as stop and adjust the volume level.** A mechanism is provided to stop, pause, mute, or adjust volume for audio that automatically plays on a page for more than 3 seconds.
2.1.1 Keyboard	**All functionalities are accessible from keyboard with no specific timings.** Users with visual or motor impairments may navigate the website using only their keyboard or through assistive technology that relies on a keyboard-like interaction with the website.
2.1.2 No Keyboard Trap	**Ensures users can navigate to and from all content using a keyboard.** Keyboard focus is never locked or trapped at one particular page element. The user can navigate to and from all navigable page elements using only a keyboard like the "Tab" or arrow keys.

Guidelines	Summary
2.1.4 Character Key Shortcuts	**Users can turn off or remap single-key character shortcuts.** Keyboard shortcuts can help some users, but cause difficulty for those using speech input and some users with motor impairments. They can also cause issues on mobile screens as the functional area is reduced on a mobile keyboard.
2.2.1 Timing Adjustable	**The reading and navigation order (determined by code order) is logical and intuitive.** Users, who rely on assistive technology (such as a screen reader) to interpret content, require content to be presented in a meaningful order. If this is presented out of sequence, users may become disorientated and may not understand the content. For example, we read from left to right in English and read a left-hand column before a right-hand column.
2.2.2 Pause, Stop, Hide	**Provide user controls to pause, stop and hide moving and auto-updating content.** Moving or auto-updating content on a website can cause difficulties for users with visual or cognitive impairments. These users may not be able to perceive the information before it changes or may be distracted by the movement.
2.3.1 Three Flashes or Below Threshold	**Do not add any content that flashes more than three times per second. Flashing content on a website can cause difficulties for users with photosensitive seizure disorders such as epilepsy and can cause these users to suffer a seizure.** Users who have seizure when viewing flashing material will be able to view all the material on a site without having a seizure, a physical reaction, and without missing the whole experience of the content. This includes people with photosensitive epilepsy as well as other photosensitive seizure disorders. It is preferred to avoid blinking content, warn users before viewing it, offer alternatives to it, and provide mechanisms to turn off animations unless necessary.
2.4.1 Bypass Blocks	**Provide a way for users to skip repeated blocks of content to access directly to the primary content of the web page by adding a skip link.** Users who have some impairments can struggle to get past repetitive content doing many clicks on the keyboards before accessing the link in the primary content.

Guidelines	Summary
2.4.2 Page Titled	**Use helpful and clear page titles.** All users benefit from descriptive page titles. A good title tells your users which page they are on and what that page is for. This lets users quickly understand if they are on the right page. Also, users with visual and cognitive impairments further benefit as the technology they use can more heavily rely on page titles.
2.4.3 Focus Order	**The navigation order of links, form elements, etc. is logical and intuitive.** **Focus Order:** is the sequence in which users access components on the website. Users with keyboard-only navigation or screen readers will follow the focus order you have set, so its essential the focus order preserves meaning and usability. Users who have motor, visual impairments, or reading difficulties benefit from the focus order of web content by using the keyboard to read the web page. They need to find their way around a website in a sequential and meaningful order.
2.4.4 Link Purpose (In Context)	**Every link's purpose is clear from its text or context.** Users with assistive technology, like a screen reader, often hear all the links on a page to help them find where they want to go. Others may view the website highly magnified or tab through links, so the user will only see the link text and a few words around it at any time. link text must make the link destination clear, in the context of their surrounding content. For example, learn more" is less informative than learn more about accessibility".
2.4.7 Focus Visible	**Keyboard focus is visible when used.** Where there are multiple elements on a webpage, it helps users to highlight which element has keyboard focus. This helps users who rely on a keyboard to navigate as it shows them which element the keyboard will interact with. Users with attention or short-term memory limitations will also benefit from a visual cue to where focus is located.
3.1.1 Language of Page	**The language of the page is identified using the HTML lang attribute (e.g., <html lang="en">).** Users who use assistive technology like screen readers and text-to-speech technologies and those who rely on synchronous media captions benefit from setting HTML language to every web page. Because the way that screen readers pronounce words depends on the HTML language assigned to the website.

Guidelines	Summary
3.2.1 On Focus	**Elements do not change when they receive focus.** Focus is vital when considering what happens on a website when users reach elements like forms, videos, and other interactive elements. Once an element receives focus from users, whether with a mouse or keyboard, the element must not automatically change (known as "changing on focus"). A change of focus is especially troublesome for users who navigate by the keyboard and disorientate them.
3.2.2 On Input	**When a user inputs information or interacts with a control, it does not result in a substantial change to the page, the spawning of a pop-up window, an additional change of keyboard focus, or any other change that could confuse or disorient the user unless the user is informed of the change ahead of time.** Users who have visual and cognitive impairments benefit from making interactive content more predictable to avoid confusion of unexpected changes in the context while navigating web pages. For example, typing in an address or selecting a date of birth must not automatically skip to another field or auto-submit.
3.3.1 Error Identification	**Users must be informed about input errors by clearly identifying and locating them.** Users who have cognitive, language, educational impairments, color blindness, and difficulties understanding the meaning of visual cues and symbols will benefit from providing timely and clear error identification guidance. That will help to understand an error has occurred.

Guidelines	Summary
3.3.2 Labels or Instructions	**Sufficient labels and instructions for required interactive elements are provided to make users expect the input data via instructions, examples, properly positioned form labels, and/or field sets/legends.** All users, including those who suffer from cognitive, language, and educational difficulties, benefit from providing clear labels and instructions to enter information correctly, which help users to do not navigate again through a page or a form to fix the issues. For example, for a "date" field in a form you might use "Enter the date as dd/mm/yyyy".
4.1.1Parsing	**Significant HTML validation/parsing errors are avoided.** Users who rely on assistive technology will benefit from a well-made website as the technology often relies on HTML parsing. Bad or broken HTML is more likely to cause parsing problems for assistive technology and so increase the chance of users leaving the website.
4.1.2 Name, Role, Value	**All elements of web content must be built for accessibility to work with the various assistive technologies.** Providing role, state, and value information on all user interface components enables compatibility with assistive technology, such as screen readers, screen magnifiers, and speech recognition software used by disabled people.

Level (A) Checklist Examples:

1.3.2 Meaningful Sequence

The reading and navigation order (determined by code order) so that it is logical and intuitive.

Explanation: Tab order here corresponds to the Dom order but not to how it displays in the output, even if CSS is used to change an element position like the "I should" button.

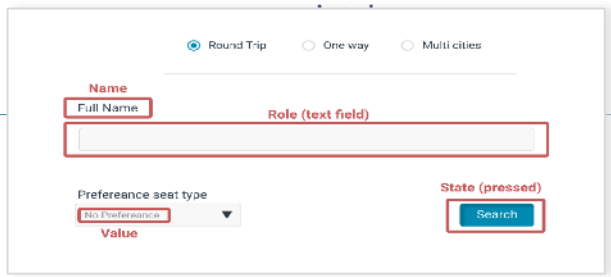
2.1.2 No Keyboard Trap

Keyboard focus is never locked or trapped at one particular page element. The user can navigate to and from all navigable page elements using only a keyboard.

Explanation: The tab key does not move forward into the next text field because the auto-complete assumes the user did not finish typing yet. So, no matter how many times he is pressing the "Tab" key, it will not move.

4.1.2 Name, Role,Value

Markup is used in a way that facilitates accessibility. This includes following the HTML/XHTML specifications and using forms, form labels, frame titles, etc.



Explanation: Some components are defined based on their information. For example, the name of an element and its role (type), whether it is a button or a text field. If it also has a value and its state, such as it is selected or pressed.

2.4.4 Name, Role,Value

- The purpose of each link (or form image button or image map hotspot) can be determined from the link text alone, or from the link text and its context (e.g., surrounding text, list item, previous heading, or table headers).
- Links (or form image buttons) with the same text that go to different locations are readily distinguishable.

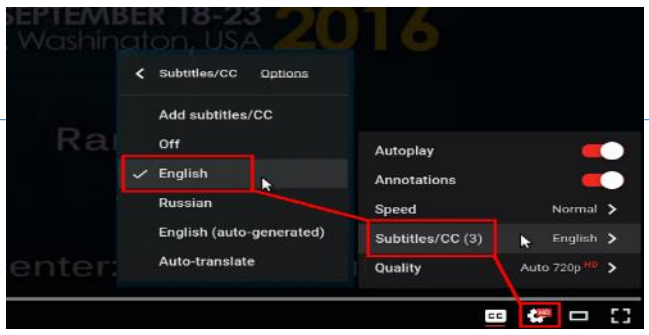
Responsive layouts
Create flexible, not fixed, layouts that work on mobile, desktop, or any other device. Learn more
Learn more about responsive layouts.

Responsive layouts
Create flexible, not fixed, layouts that work on mobile, desktop, or any other device.

Explanation: Link text should give any user enough information to decide whether they want to click it or not. For example, "learn more about the responsive layouts" is more informative than "learn more." You can also use the heading itself as the link instead.

1.2.2 Captions (Prerecorded)

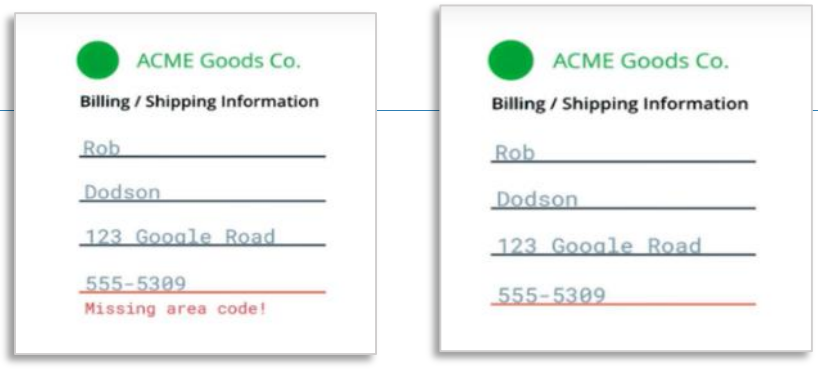
Synchronized captions are provided for non-live video (YouTube videos, etc.).



Explanation: YouTube is a good example of video players that provide CC service.

1.4.1 Use of Color

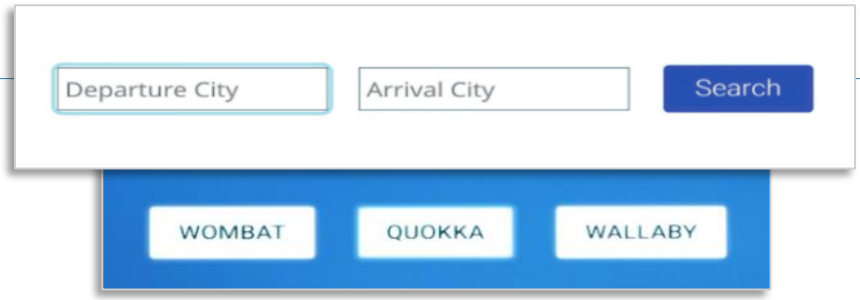
- Color is not used as the sole method of conveying content or distinguishing visual elements.
- Color alone is not used to distinguish links from surrounding text unless the contrast ratio between the link and the surrounding text is at least 3:1 and an additional distinction (e.g., it becomes underlined) is provided when the link is hovered over and receives focus.



Explanation: Signifying invalid elements with just colors like red may not be conveyed for colorblind or screen reader users. So, it should be clarified by text for example.

2.4.7 Focus Visible

It is visually apparent which page element has the current keyboard focus (i.e., as you tab through the page, you can see where you are).



Explanation: The focus ring must be styled or formatted with the other elements, as well as, it must be convenient with the design very well.

6.1.2 WCAG Checklist Level AA:

This level includes all Level A and AA requirements. Deals with the biggest and most common barriers for disabled users. A web content developer **shall** satisfy this checkpoint. Otherwise, one or more groups will find it difficult to access information in the document.

Government entities are required to meet at minimum Level AA requirements to guarantee websites accessibility.

Guidelines	Summary
1.2.4 Captions (Live)	**Synchronized captions are provided for live media that contains audio.** Users with hearing impairments may rely on captions to enjoy video content while live streaming.
1.2.5 Audio Description (Pre-recorded)	**Audio descriptions are provided for pre-recorded videos.** Users with visual impairments or cognitive limitations may rely on audio description to enjoy videos. Adding an audio description soundtrack to videos means these users get all information from the content.
1.3.4 Orientation	**Orientation of web content is not restricted to only portrait or landscape.** Some users have a preferred orientation (portrait or landscape) or physical requirements that require making content adapt to their preference. Others have visual impairments and may find one view easier to use.
1.3.5 Identify Input Purpose	**The purpose of input fields must be programmatically determinable.** All users, particularly those with cognitive impairments, benefit from programmatically determinable input fields. These allow assistive technologies to understand the purpose of fields and present them in a preferred format to the user. In addition, users with motor impairments benefit from auto-complete forms to allow the browser pre-filling fields, thus reducing the required movements from them.
1.4.3 Contrast (Minimum)	**Contrast ratio between text and background is at least 4.5:1.** Some users with visual impairment need a stronger contrast than others to understand the content, so using the right color is essential. It is done by using a light background and dark text, or using a dark background and light text and using a color contrast checker to verify the choice.

Guidelines	Summary
1.4.4 Resize Text	**Text can be resized to 200% without loss of content or function.** Some users with visual impairment need to res 

to understand it entirely, as in many government portals. To help these users, the website should allow for up to a 200% resize of text without dropping any content or functions. This should be accomplished in a browser and therefore not require any assistive technology. |
1.4.5 Images of Text	**Do not use images of text.** Users with visual or cognitive impairments may rely on changing font size, color, alignment, or spacing to enjoy the content. So, do not use an image of text when you can use plain text. Display quotes as text rather than images and use CSS to style headings and navigation menus as text.
1.4.10 Reflow	**Content retains meaning and function without scrolling in two dimensions.** When users enlarge content up to 400% of the default size, they should not have to scroll in their browser in more than one direction —horizontally and vertically.
1.4.11 Non-text Contrast	**The contrast between user interface components, graphics and adjacent color is at least 3:1.** Some users who have visual impairments need a stronger contrast than others to fully distinguish and use components such as input fields, buttons, and controls, so getting the color choice right is essential.
1.4.12 Text Spacing	**Content and function retain meaning when users change elements of text spacing.** Users may wish to amend the default spacing around text content to make it easier for them to read and understand. For example, content and function remain intact when a user changes line height to at least 1.5 times the font size and paragraph spacing to at least twice the font size.
1.4.13 Content on Hover or Focus	**When hover or focus triggers content to appear, it is dismissible, hover able and persistent.** Additional content triggered by keyboard focus or mouse hover can cause accessibility issues for users with visual or cognitive impairments. Additional content can surprise users, prevent them completing a task, or obscure content. To overcome these issues, users must be able to understand when additional content appears and dismiss it without moving keyboard focus or mouse hover (for example, by pressing the "escape" key or closing on click). And hover able by the mouse pointer so the pointer can be moved over the content, and persistent until the user changes keyboard focus or mouse hover, dismisses the content or the content is no longer valid.

Guidelines	Summary
2.4.5 Multiple Ways	**Offer at least two ways to find pages on a website.** For example, users with visual impairments may prefer a search function, whereas those with cognitive impairments may find a sitemap easier to use.
2.4.6 Headings and Labels	**Headings and labels describe topic or purpose.** Users with reading disabilities (slow reading) or short-term memory issues benefit from headings of content sections to clarify what each section contains. People who use screen readers may also use headings to navigate to sections. As well as headings, descriptive labels on form control help users know how to complete the form fields.
3.1.2 Language of Parts	**Tell users when the language on a page changes.** If the website has content in a different language to its main language, users should be informed about the change. This helps those who use assistive technology to read the full content.
3.2.3 Consistent Navigation	**Use menus in the same place across the website.** When you visit a website these days, it's almost second nature to understand where the main menu is and to expect it to be in the same place on every page. Web designers know that having a consistent navigation menu helps users move around websites. Consistent navigation helps users who may have trouble moving around a website and find themselves "lost" more often than others. Users who rely on spatial navigation due to impaired sight or need extra help understanding the website and navigate through it will be more satisfied. This consistency also applies to standard parts of the website —things like a search box. Do not move them all over the place; but use a consistent template for key elements.
3.2.4 Consistent Identification	**Use icons and buttons consistently.** It should be obvious that using consistent identification across the website helps users move around, interact and do what you want them to do. Unfortunately, it's often overlooked buttons, icons, or links with the same function look completely different.

Guidelines	Summary
3.3.3 Error Suggestion	**Suggest fixes when users make errors.** When the error is missing a required field, communicate this to the user with a text suggestion. If the error is in the format of the input, the suggestion shows the correct format (for example, 'The date must be in the form DD/MM/YYYY'). If the error is because the input needed to be from a limited list of values, provide these values and explain them.
3.3.4- Error Prevention (Legal, Financial, Data)	**Reduce the risk of input errors for sensitive data.** All users make mistakes when inputting data (for example, into forms and checkouts). You should try to prevent errors occurring, especially when users are committing to legal or financial agreements, or otherwise sharing their data. Users can make costly mistakes if they do not fully understand the implications of their actions or cannot rectify their errors. Error prevention is all about reducing risk to users by adding in confirmation stages to processes that pose a legal or financial risk. Add a confirmation page to the data input submission process that summarizes the input and the outcome, with an option to correct or discontinue. This page has an input field (for example, a confirm button or checkbox) that acts as confirmation of the submission.

Level (AA) Checklist Examples:

1.3.4 **Orientation**

Orientation of web content is not restricted to only portrait or landscape, unless a specific orientation is necessary

Explanation: The website can be displayed horizontally or vertically (as in the image).

1.3.5 **Identify Input Purpose**

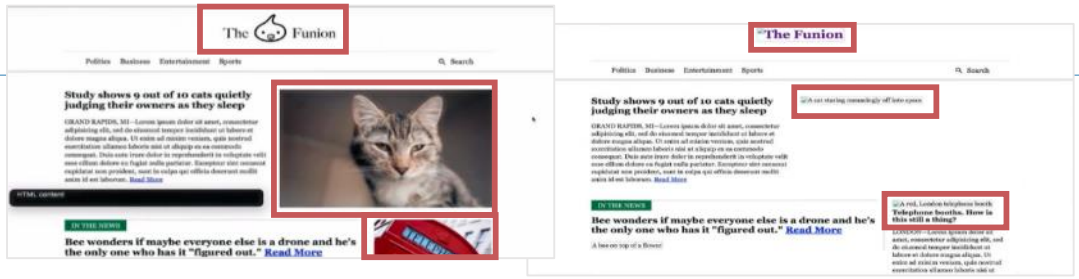
Input fields that collect certain types of user information have an appropriate autocomplete attribute defined.

```
<form>
<label for="input-email">Email address</label>
<input id="input-email" autocomplete="email" type="email">
<label for="input-password">Password</label>
<input id="input-password" autocomplete="current-password"
type="password">
<button name="button-sign-in">Sign in</button>
</form>
```

Explanation: Input fields can be specified programmatically to let the user know the required data type. For example, auto-complete.

1.4.5 Images of Text

If the same visual presentation can be made using text alone, an image is not used to present that text..



Explanation: "Alt" attribute must provide a meaningful description that conveying the same thing as the image in given text.

1.4.13 Content on Hover or Focus

When hover or focus triggers content to appear, it is dismissible, hover able and persistent

Explanation: User can close the additional content as in the image.

6.1.3 WCAG Checklist Level AAA:

This Level includes all Level A, AA, and AAA requirements. The highest (and most complex) level of web accessibility. A web content developer **may** address this checkpoint. Otherwise, one or more groups will find it somewhat difficult to access information in the document.

- Contrast ratio between text and background is at least 7:1.
- Text is used within an image only for decoration.
- All functionality is accessible by keyboard with no exceptions.
- Users must be warned about timeouts that cause data loss, like filling a form.

For more level AAA instructions, refer to Web Content Accessibility Guidelines (WCAG) 2.1and the level AAA checklist.

6.2 Tools for Checking Web Accessibility

Before explaining web accessibility guidelines in the next section, it is better to run automatic accessibility testing to go through your website and explore accessibility issues. Below are our recommendations:

AXE-Accessibility Browser Extensions

The Axe accessibility checker for Chrome is a fast, lightweight accessibility testing tool that returns zero false positives. It only tests for accessibility issues that can be accurately detected via automation, and it only tests for components that actually exist on the page or application you're testing.

Chrome Lighthouse

Lighthouse is an open-source, automated tool for improving the quality of web pages. You can run it against any web page, public or requiring authentication. It has audits for performance, accessibility, progressive web apps, SEO and more.

Accessibility Insights for Web

Accessibility Insights for Web is a browser extension that helps developers find and fix accessibility issues in web apps and sites.

WAVE (Web Accessibility Evaluation Tool)

WAVE is a suite of evaluation tools that helps authors make their web content more accessible to individuals with disabilities. WAVE can identify many accessibility and Web Content Accessibility Guideline (WCAG) errors, but also facilitates human evaluation of web content.

6.3 Assistive Technologies

Voice Detection

Enable user to navigate through website through speaking and speech recognition technology.

Screen Readers

A software that allows blind people to hear the information displayed on screen via

text-to-speech technology.

Head/ Eye Tracking software

Technologies that capture eye gaze and head movements to help people with motor impairment to navigate through the website.

Braille Technologies

A device that allows people to feel the text on screen with their fingers on the braille screen.

7 .Table of Abbreviations

Abbreviations	Description
HTML	Hyper Text Markup Language for creating Web pages
CSS	Cascading Style Sheet
DOM	Document Object Model

8. References and relevant legislation

- W3C 2018, 'How to Meet WCAG (Quick Reference)', W3C, accessed 1 Sep 2021, <https://www.w3.org/WAI/WCAG21/quickref/>.
- The Institute for Disability Research, Policy, and Practice at Utah State University 2021, 'WebAIM's WCAG 2 Checklist', WebAIM, accessed 1 Sep 2021, <https://webaim.org/standards/wcag/checklist>.
- Mozilla 2022, MDN Web Docs, accessed 1Jun 2021, <https://developer.mozilla.org/>.
- W3C 2020, 'Web Content Accessibility Guidelines (WCAG) 2. Level AA Conformance', W3C, accessed 5 Jun 2021, < https://www.w3.org/WAI/WCAG2AA-Conformance>.
- Luke McGrath, 'WCAG Checklists', wuhcag, accessed 10 Jun 2021, < https://www.wuhcag.com/wcag-checklist/>.
- Michigan Department of Education, 'Cognitive Impairment', michiganallianceforfamilies, accessed 15 Oct 2020, < https://www.michiganallianceforfamilies.org/cognitive-impairment/>.
- Yale University, 'Navigation', Yale University-Usability & Web Accessibility, accessed 26 Jun 2021, <https://usability.yale.edu/web-accessibility/articles/navigation>.
- Yale University, 'Multimedia', Yale University-Usability & Web Accessibility, accessed 26 Jun 2021, <https://usability.yale.edu/web-accessibility/articles/multimedia>.

هيئة الحكومة الرقمية
Digital Government Authority