Lesson 3: Web Standards and Web Accessibility Standards

3.1. The World Wide Web Consortium (W3C)

W3C is an international industry group committed to lead the web to its full potential founded in 1994. It is presented by three research institutions, namely the Massachusetts Institute of Technology (MIT), Institut National de Recherche en Informatique et en Automatique (French National Institute for Research in Computer Science and Control) (INRIA)and Keio University.

The W3C develops open specifications to enrich the interoperability of web-related outputs. The consortium has a pool of experts and working groups who create working drafts and proposed recommendations submitted to the W3C membership and director for its approval. They are composed of its members, other entities involved in creating web applications, and invited experts. Its main function is to standardize web technology.

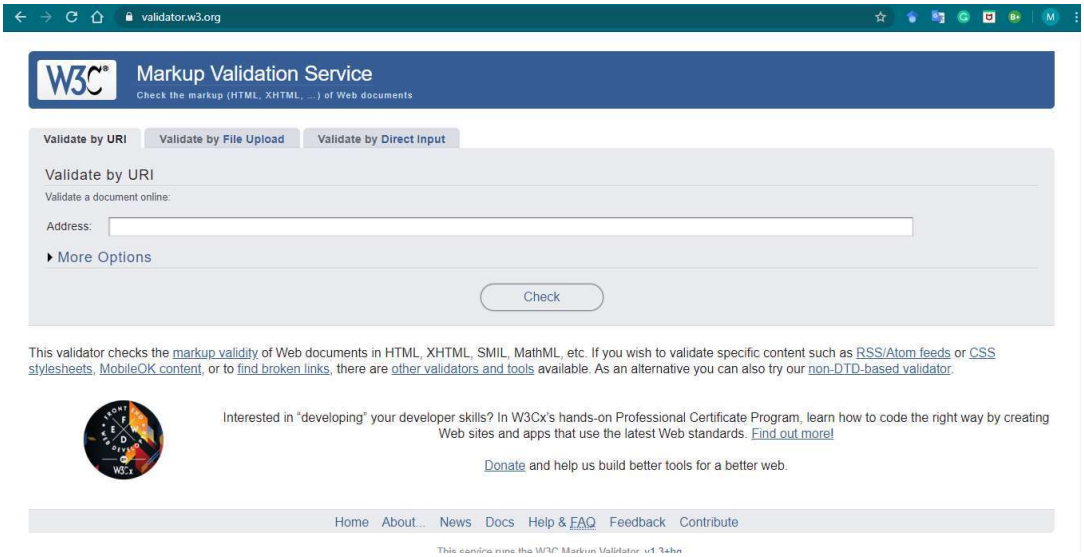
3.2. Web Standards

According to the W3C official website, W3C publishes documents that define Web technologies. These documents follow a process designed to promote consensus, fairness, public accountability, and quality. At the end of this process, W3C publishes Recommendations, which are considered Web standards. (Source: https://www.w3.org/standards/faq#std).

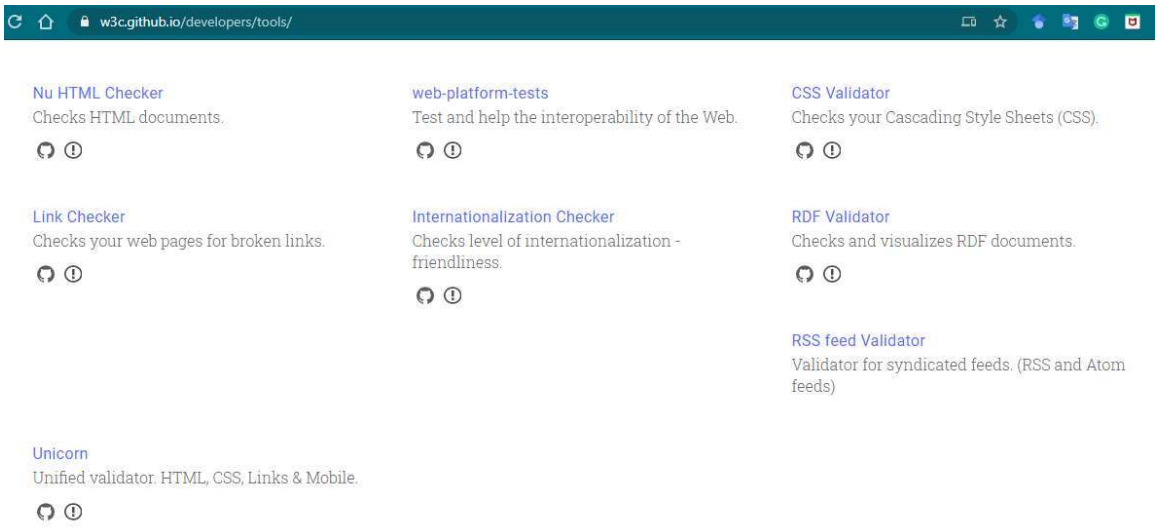
More importantly, W3C standards define an Open Web Platform for application development that has the unprecedented potential to enable developers to build rich interactive experiences, powered by vast data stores, that are available on any device. Although the boundaries of the platform continue to evolve, industry leaders speak nearly in unison about how HTML5 will be the cornerstone for this platform. But the full strength of the platform relies on many more technologies that W3C and its partners are creating, including CSS, SVG, WOFF, the Semantic Web stack, XML, and a variety of APIs. (Source: https://www.w3.org/standards/)

Web standards are crafted and established by W3C to encourage uniformity of the design code for web pages. These standards are rules and guidelines for the markup language how web pages display them on the web browser.

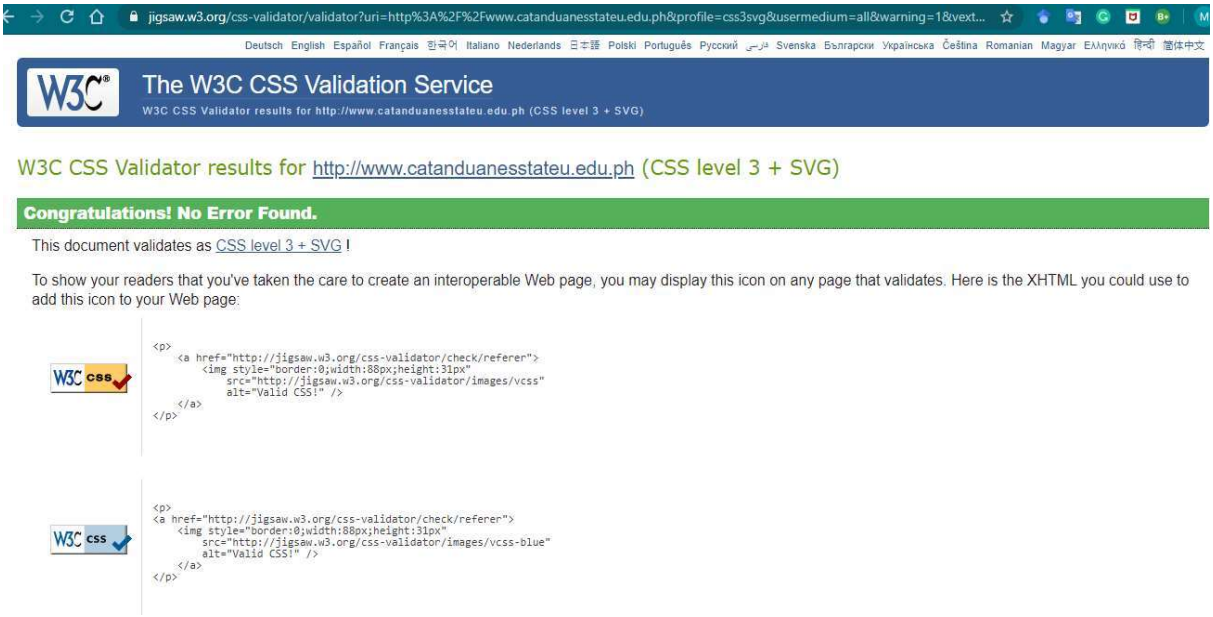
You can check or validate your HTML markup of web documents by accessing this link http://validator.w3.org or https://html5.validator.nu/



You may visit this link https://w3c.github.io/developers/tools/ if you want to validate other content such as CSS stylesheets, RSS feed validator, Link checker, or web platform tests.



Here is the result of validating the style sheets of the CatSU website at http://jigsaw.w3.org/css-validator.



3.3. Web Accessibility Standards

Web accessibility is the method of ensuring that there are new barriers that prevent interaction with, or access to, websites by people with physical disabilities, situational disabilities, and socio-economic restrictions and bandwidth and speed. All users have equal access to information and functionality of the sites when the sites are properly designed and developed conforming to web accessibility standards set forth by W3C.

Not only people with disabilities can profit from web accessibility but also those without disabilities, in particular, those using mobile phones, smart television and other devices with small screen; older people where abilities are shifting due to aging; people with temporary disabilities such as broken arms; people with situational limitations and those using slow internet connectivity.

Web accessibility aims to address visual impairment, difficulty, or inability to use hands, deafness or hearing impairments, developmental disabilities, learning difficulties, and cognitive disabilities of various origins and the likes.

The Web Accessibility Initiative (WAI), a project by W3C, is composed of people from the industry, disability organizations, government, and research labs from around the world that develops guidelines, technical specifications, and resources describing solutions to help make the Web accessible to people with auditory, cognitive, neurological, physical, speech, and visual disabilities. (Source: https://www.w3.org/standards/webdesign/accessibility).

3.3. Web Accessibility Principles

(Source: https://www.w3.org/WAI/fundamentals/accessibility-principles/#standards)

The discussion presented here was taken from the W3C website on Accessibility Principles. This topic introduces requirements for websites, web applications, browsers, and other tools.

3.3.1 Web accessibility standards

Web accessibility relies on several components that work together. Some of these include:

- Web content - refers to any part of a website, including text, images, forms, and multimedia, as well as any markup code, scripts, applications, and such.
- User agents - software that people use to access web content, including desktop graphical browsers, voice browsers, mobile phone browsers, multimedia players, plug-ins, and some assistive technologies.
- Authoring tools - software or services that people use to produce web content, including code editors, document conversion tools, content management systems, blogs, database scripts, and other tools.

The WAI published the Web Content Accessibility Guidelines (WCAG). WAI's provides a set of guidelines that are internationally recognized as the standard for web accessibility. These include:

- Web Content Accessibility Guidelines (WCAG). This refers to any portion of a website or web application such as text, images, multimedia, markup codes, scripts, and the like.
- User Agent Accessibility Guidelines (UAAG). This refers to applications used to access web content such as a desktop or mobile browsers, multimedia players, and plugins.
- Authoring Tool Accessibility Guidelines (ATAG). This refers to services that “authors” (web developers, designers, writers, etc.) use to produce web content (static web pages, dynamic web applications,
- Web Accessibility Initiative – Accessible Rich Internet Applications (WAI-ARIA) specification for accessible rich Internet applications specifies how to raise the accessibility of web pages.

3.3.2 Web Accessibility Requirements

Source: https://www.w3.org/WAI/fundamentals/accessibility-principles/#standards

A. Perceivable Information and user interface

1. **Text alternatives for non-text content**. Text alternatives are equivalents for non-text content. Examples include:

    - Short equivalents for images, including icons, buttons, and graphics
    - Description of data represented on charts, diagrams, and illustrations
    - Brief descriptions of non-text content such as audio and video files

- Labels for form controls, input, and other user interface components

Text alternatives convey the purpose of an image or function to provide an equivalent user experience. For instance, an appropriate text alternative for a search button would be “search” rather than a “magnifying lens”.

Accessibility Requirements related to Text Alternative

Standards/ Guidelines	Specific
WCAG	**Guideline 1.1 - Text Alternatives**[5] 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. 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. 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 Success Criterion 4.1.2 for additional requirements for controls and content that accepts user input.) b. **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.) c. **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. d. **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. e. **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. f. **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.
UAAG	**Guideline 1.1 – Provide access to alternative content**[6] The user can choose to render any type of alternative content available (1.1.1) with an indicator that the alternative content is present (1.1.2) or a placeholder replacing the non-text content (1.1.3). It's recommended that users can also choose at least one alternative, such as alt text, to be displayed by default (1.1.5). It's recommended that caption text or sign language alternative cannot obscure the video or the controls (1.1.4) and that the user can configure the text (1.1.6), size, and position of media alternatives (1.1.7).
ATAG 2.0[7]	Principle A.1: Authoring tool user interfaces follow applicable accessibility guidelines Guideline A.2.1: (For the authoring tool user interface) Make alternative content available to authors Guideline A.2.2: (For the authoring tool user interface) Ensure that editing-view presentation can be programmatically determined Guideline A.3.7: (For the authoring tool user interface) Ensure that previews are at least as accessible as in-market user agents Part B. Support the production of accessible content

[5] How to meet WCAG (Quickref reference). (n.d.). World Wide Web Consortium (W3C). https://www.w3.org/WAI/WCAG21/quickref/#text-alternatives
[6] User agent accessibility guidelines (UAAG) 2.0. (n.d.). World Wide Web Consortium (W3C). https://www.w3.org/TR/UAAG20/#gl-access-alternative-content
[7] Authoring tool accessibility guidelines (ATAG) 2.0. (n.d.). World Wide Web Consortium (W3C). https://www.w3.org/TR/ATAG20

2. **Captions and other alternatives for multimedia.** People who cannot hear the audio or see video need alternatives. Examples include:
   - Text transcripts and captions for audio content, such as recordings of a radio interview
   - Audio descriptions, which are narrations to describe important visual details in a video
   - Sign language interpretation of audio content, including relevant auditory experiences

   Well-written text transcripts containing the correct sequence of any auditory or visual information provide a basic level of accessibility and facilitate the production of captions and audio descriptions.

Accessibility Requirements related to Multimedia

Standards/ Guidelines	Specific
WCAG	Guideline 1.2 - Time-based Media[8] 3.2.1. Audio-only and Video-only (Prerecorded) 3.2.2. Captions (Prerecorded) 3.2.3. Audio Description or Media Alternative (Prerecorded) 3.2.4. Captions (Live) 3.2.5. Audio Description (Prerecorded) 3.2.6. Sign Language (Prerecorded) 3.2.7. Extended Audio Description (Prerecorded) 3.2.8. Media Alternative (Prerecorded) 3.2.9. Audio-Only (Live)
UAAG	Guideline 1.1 - Alternative content
ATAG 2.0[9]	Principle A.1: Authoring tool user interfaces follow applicable accessibility guidelines Guideline A.2.1: (For the authoring tool user interface) Make alternative content available to authors Guideline A.3.7: (For the authoring tool user interface) Ensure that previews are at least as accessible as in-market user agents Part B. Support the production of accessible content

3. **Content can be presented in different ways.** For users to be able to change the presentation of content, it is necessary that:
   - Headings, lists, tables, input fields, and content structures are marked-up properly
   - Sequences of information or instructions are independent of any presentation
   - Browsers and assistive technologies provide settings to customize the presentation

   Meeting this requirement allows content to be correctly read aloud, enlarged, or adapted to meet the needs and preferences of different people. For instance, it can be presented using custom color combinations, text size, or another styling to facilitate reading. This requirement also facilitates other forms of adaptation, including automatic generation of page outlines and summaries to help people get an overview and to focus on parts more easily.

[8] How to meet WCAG (Quickref reference). (n.d.). World Wide Web Consortium (W3C). https://www.w3.org/WAI/WCAG21/quickref/#time-based-media
[9] Authoring tool accessibility guidelines (ATAG) 2.0. (n.d.). World Wide Web Consortium (W3C). https://www.w3.org/TR/ATAG20

Accessibility Requirements related to Adaptability

Standards/ Guidelines	Specific
WCAG	Guideline 1.3 – Adaptable[10] Create content that can be presented in different ways (for example simpler layout) without losing information or structure. 1.3.1. Infor and Relationships 1.3.2 Meaningful Sequence 1.3.3 Sensory Characteristics 1.3.4 Orientation 1.3.5 Identify Input Purpose 1.3.6 Identify Purpose
UAAG	Guideline 1.4 - Text configuration Guideline 1.5 - Volume configuration Guideline 1.6 - Synthesized speech configuration Guideline 1.7 - User style sheet configuration Guideline 1.9 - Alternative views Guideline 1.10 - Element information
ATAG 2.0[11]	Principle A.1: Authoring tool user interfaces follow applicable accessibility guidelines Guideline A.2.2: (For the authoring tool user interface) Ensure that editing-view presentation can be programmatically determined Guideline A.3.7: (For the authoring tool user interface) Ensure that previews are at least as accessible as in-market user agents Part B. Support the production of accessible content

4. **Content is easier to see and hear.** Distinguishable content is easier to see and hear. Such content includes:
   - Color is not used as the only way of conveying information or identifying content
   - Default foreground and background color combinations provide sufficient contrast
   - When users resize text up to 400% or change text spacing, no information is lost
   - Text reflows in small windows ("viewports") and when users make the text larger
   - Images of text are resizable, replaced with actual text, or avoided where possible
   - Users can pause, stop, or adjust the volume of audio that is played on a website
   - Background audio is low or can be turned off, to avoid interference or distraction

Accessibility Requirements related to Distinguishability

Standards/ Guidelines	Specific
WCAG	Guideline 1.4 - Distinguishable[12] Make it easier for users to see and hear content including separating foreground from background. 1.4.1 Use of color 1.4.2 Audio Control 1.4.3 Contrast (Minimum) 1.4.4 Resize Text 1.4.5 Images of Text

[10] How to meet WCAG (Quickref reference). (n.d.). World Wide Web Consortium (W3C). https://www.w3.org/WAI/WCAG21/quickref/#adaptable
[11] Authoring tool accessibility guidelines (ATAG) 2.0. (n.d.). World Wide Web Consortium (W3C). https://www.w3.org/TR/ATAG20
[12] How to meet WCAG (Quickref reference). (n.d.). World Wide Web Consortium (W3C). https://www.w3.org/WAI/WCAG21/quickref/#distinguishable

Standards/ Guidelines	Specific
	1.4.6 Contrast (Enhanced) 1.4.7 Low or No Background Audio 1.4.8 Visual Presentation 1.4.9 Images of Text (No Exception) 1.4.10 Reflow 1.4.11 Non-Text Contrast 1.4.12 Text Spacing 1.4.13 Content on Hover or Focus
UAAG	Guideline 1.3 - Highlighting Guideline 1.4 - Text configuration Guideline 1.5 - Volume configuration Guideline 1.6 - Synthesized speech configuration Guideline 1.7 - User style sheet configuration Guideline 1.8 - Orientation in viewports Guideline 1.9 - Alternative views Guideline 1.10 - Element information
ATAG 2.0[13]	Principle A.1: Authoring tool user interfaces follow applicable accessibility guidelines Guideline A.3.7: (For the authoring tool user interface) Ensure that previews are at least as accessible as in-market user agents Part B. Support the production of accessible content

B. Operable User Interface and Navigation

1. **Functionality is available from a keyboard.** Many people do not use the mouse and rely on the keyboard to interact with the Web. This requires keyboard access to all functionality, including form controls, input, and other user interface components. Keyboard accessibility includes:
    - All functionality that is available by the mouse is also available by keyboard
    - Keyboard focus does not get trapped in any part of the content
    - Web browsers, authoring tools, and other tools provide keyboard support

Accessibility Requirements related to Keyboard Accessibility

Standards/ Guidelines	Specific
WCAG	Guideline 2.1 – Keyboard Accessible[14] Make all functionality available from a keyboard. 2.1.1 Keyboard 2.1.2 No Keyboard Trap 2.1.3 Keyboard (No Exception) 2.1.4 Character Key Shortcuts
UAAG	Guideline 2.1 - Keyboard access Guideline 2.2 - Sequential navigation Guideline 2.3 - Direct navigation and activation Guideline 2.11 - Other Input Devices
ATAG 2.0[15]	Principle A.1: Authoring tool user interfaces follow applicable accessibility guidelines Guideline A.3.1: (For the authoring tool user interface) Provide keyboard access to authoring features

[13] Authoring tool accessibility guidelines (ATAG) 2.0. (n.d.). World Wide Web Consortium (W3C). https://www.w3.org/TR/ATAG20

[14] How to meet WCAG (Quickref reference). (n.d.). World Wide Web Consortium (W3C). https://www.w3.org/WAI/WCAG21/quickref/#keyboard-accessible

[15] Authoring tool accessibility guidelines (ATAG) 2.0. (n.d.). World Wide Web Consortium (W3C). https://www.w3.org/TR/ATAG20

Standards/ Guidelines	Specific
	Part B. Support the production of accessible content

2. **Users have enough time to read and use the content.** Some people need more time than others to read and use the content. For instance, some people require more time to type text, understand instructions, operate controls, or to otherwise complete tasks on a website.

   Examples of providing enough time include providing mechanisms to:
   - Stop, extend, or adjust time limits, except where necessary
   - Pause, stop or hide moving, blinking, or scrolling content
   - Postpone or suppress interruptions, except where necessary
   - Re-authenticate when a session expires without losing data

Accessibility Requirements related to Sufficient Time

Standards/ Guidelines	Specific
WCAG	Guideline 2.2 - Enough time[16] Provide users enough time to read and use the content. 2.2.1 Timing Adjustable 2.2.2 Pause, Stop, Hide 2.2.3 No Timing 2.2.4 Interruptions 2.2.5 Re-authenticating 2.2.6 Timeouts
UAAG	Guideline 2.8 - Time-independent interaction Guideline 2.10 - Time-based media
ATAG 2.0[17]	Principle A.1: Authoring tool user interfaces follow applicable accessibility guidelines Guideline A.3.2: (For the authoring tool user interface) Provide authors with enough time Part B. Support the production of accessible content

3. **Content does not cause seizures and physical reactions.** Content that flashes at certain rates or patterns can cause photosensitive reactions, including seizures. Flashing content is ideally avoided entirely or only used in a way that does not cause known risks. Also, animations and moving content can cause discomfort and physical reactions.

   Examples of avoiding causing seizures and physical reactions:
   - Do not include content that flashes at particular rates and patterns
   - Warn users before flashing content is presented, and provide alternatives
   - Provide mechanisms to switch off animations, unless they are essential

[16] How to meet WCAG (Quickref reference). (n.d.). World Wide Web Consortium (W3C). https://www.w3.org/WAI/WCAG21/quickref/#enough-time

[17] Authoring tool accessibility guidelines (ATAG) 2.0. (n.d.). World Wide Web Consortium (W3C). https://www.w3.org/TR/ATAG20

Accessibility Requirements related to Seizures

Standards/ Guidelines	Specific
WCAG	Guideline 2.3 - Seizures[18] Do not design content in a way that is known to cause seizures or physical reactions. 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. 2.3.2 Three Flashes. Web pages do not contain anything that flashes more than three times in any one second period. 2.3.3 Animation from Interactions. Motion animation triggered by interaction can be disabled unless the animation is essential to the functionality or the information being conveyed.
UAAG	Guideline 2.9 - Flashing[19]
ATAG 2.0[20]	Principle A.1: Authoring tool user interfaces follow applicable accessibility guidelines Guideline A.3.3: (For the authoring tool user interface) Help authors avoid flashing that could cause seizures Part B. Support the production of accessible content

4. **Users can easily navigate, find content, and determine where they are.** Well organized content helps users to orient themselves and to navigate effectively. Such content includes:

    - Pages have clear titles and are organized using descriptive section headings
    - There is more than one way to find relevant pages within a set of web pages
    - Users are informed about their current location within a set of related pages
    - There are ways to bypass blocks of content that are repeated on multiple pages
    - The keyboard focus is visible, and the focus order follows a meaningful sequence
    - The purpose of a link is evident, ideally even when the link is viewed on its own

Accessibility Requirements related to Navigation

Standards/ Guidelines	Specific
WCAG	Guideline 2.4 - Navigable[21] Provide ways to help users navigate, find content, and determine where they are. 2.4.1 Bypass Blocks. A mechanism is available to bypass blocks of content that are repeated on multiple Web pages. 2.4.2 Page Titled. Web pages have titles that describe topic or purpose. 2.4.3 Focus Order. If a Web page can be navigated sequentially and the navigation sequences affect meaning or operation, focusable components receive focus in an order that preserves meaning and operability. 2.4.4 Link Purpose. The purpose of each link can be determined from the link text alone or the link text together with its programmatically determined link context, except where the purpose of the link would be ambiguous to users in general. 2.4.5 Multiple Ways. More than one way is available to locate a Web page within a set of Web pages except where the Web Page is the result of, or a step in, a process.

[18] How to meet WCAG (Quickref reference). (n.d.). World Wide Web Consortium (W3C). https://www.w3.org/WAI/WCAG21/quickref/#seizures-and-physical-reactions
[19] User agent accessibility guidelines (UAAG) 2.0. (n.d.). World Wide Web Consortium (W3C). https://www.w3.org/TR/UAAG20/#gl-prevent-flash
[20] Authoring tool accessibility guidelines (ATAG) 2.0. (n.d.). World Wide Web Consortium (W3C). https://www.w3.org/TR/ATAG20
[21] How to meet WCAG (Quickref reference). (n.d.). World Wide Web Consortium (W3C). https://www.w3.org/WAI/WCAG21/quickref/# navigable

Standards/ Guidelines	Specific
	2.4.6 Headings and Labels. Headings and labels describe topic or purpose. 2.4.7 Focus Visible. Any keyboard operable user interface has a mode of operation where the keyboard focus indicator is visible. 2.4.8 Location. Information about the user's location within a set of Web pages is available. 2.4.9 Link Purpose (Link Only). A mechanism is available to allow the purpose of each link to be identified from the link text alone, except where the purpose of the link would be ambiguous to users in general. 2.4.10 Section Headings. Section headings are used to organize the content.
UAAG	Guideline 2.2 - Sequential navigation[22] Guideline 2.3 - Direct navigation and activation Guideline 2.4 - Text search Guideline 2.5 - Structural navigation Guideline 2.7 - Graphical controls
ATAG 2.0[23]	Principle A.1: Authoring tool user interfaces follow applicable accessibility guidelines Guideline A.3.3: (For the authoring tool user interface) Help authors avoid flashing that could cause seizures Part B. Support the production of accessible content

5. **Users can use different input modalities beyond the keyboard.** Input modalities beyond the keyboard, such as touch activation, voice recognition (speech input), and gestures make content easier to use for many people. Yet not everyone can use each of these input modalities, and to the same degree. Particular design considerations maximize the benefit of these input modalities. This includes:
    - Gestures that require dexterity or fine movement have alternatives that do not require high dexterity
    - Components are designed to avoid accidental activation, for example by providing undo functionality
    - Labels presented to users match corresponding object names in the code, to support activation by voice
    - Functionality that is activated by movement can also be activated through user interface components
    - Buttons, links, and other active components are large enough to make them easier to activate by touch

Accessibility Requirements related to Input Modalities

Standards/ Guidelines	Specific
WCAG	Guideline 2.5 – Input Modalities [24] Make it easier for users to operate functionality through various inputs beyond the keyboard. 2.5.1 Pointer Gestures. All functionality that uses multipoint or path-based gestures for operation can be operated with a single pointer without a path-based gesture unless a multipoint or path-based gesture is essential. 2.5.2 Pointer Cancellation 2.5.3 Label in Name. For user interface components with labels that include text or images of text, the name contains the text that is presented visually.

[22] User agent accessibility guidelines (UAAG) 2.0. (n.d.). World Wide Web Consortium (W3C). https://www.w3.org/TR/UAAG20/#gl-sequential-navigation
[23] Authoring tool accessibility guidelines (ATAG) 2.0. (n.d.). World Wide Web Consortium (W3C). https://www.w3.org/TR/ATAG20
[24] How to meet WCAG (Quickref reference). (n.d.). World Wide Web Consortium (W3C). https://www.w3.org/WAI/WCAG21/quickref/#input-modalities

Standards/ Guidelines	Specific
	2.5.4 Motion Actuation. Functionality that can be operated by device motion or user motion can also be operated by user interface components and responding to the motion can be disabled to prevent accidental actuation, 2.5.5 Target Size 2.5.6 Concurrent Input Mechanisms. Web content does not restrict the use of input modalities available on a platform except where the restriction is essential, required to ensure the security of the content, or required to respect user settings.

C. Understandable information and user interface

1. **The text is readable and understandable.** Content authors need to ensure that text content is readable and understandable to the broadest audience possible, including when it is read aloud by text-to-speech. Such content includes:
   - Identifying the primary language of a web page, such as Arabic, Dutch, or Korean
   - Identifying the language of text passages, phrases, or other parts of a web page
   - Providing definitions for any unusual words, phrases, idioms, and abbreviations
   - Using the clearest and simplest language possible, or providing simplified versions

Accessibility Requirements related to Readability

Standards/ Guidelines	Specific
WCAG	Guideline 3.1 - Readable[25] Make text content readable and understandable. 3.1.1 Language of Page. The default human language of each Web page can be programmatically determined. 3.1.2 Language of Parts. The human language of each passage or phrase in the content can be programmatically determined except for proper names, technical terms, words of indeterminate language, and words or phrases that have become part of the vernacular of the immediately surrounding text. 3.1.3 Unusual Words. A mechanism is available for identifying specific definitions of words or phrases used in an unusual or restricted way, including idioms and jargon. 3.1.4 Abbreviations. A mechanism for identifying the expanded form or meaning of abbreviations is available. 3.1.5 Reading Level. When text requires reading ability more advanced than the lower secondary education level after removal of proper names and titles, supplemental content, or a version that does not require reading ability more advanced than the lower secondary education level, is available. 3.1.6 Pronunciation. A mechanism is available for identifying specific pronunciation of words where the meaning of the words, in context, is ambiguous without knowing the pronunciation.
ATAG 2.0[26]	Principle A.1: Authoring tool user interfaces follow applicable accessibility guidelines Guideline A.4.2: (For the authoring tool user interface) Document the user interface, including all accessibility features Part B. Support the production of accessible content

[25] How to meet WCAG (Quickref reference). (n.d.). World Wide Web Consortium (W3C). https://www.w3.org/WAI/WCAG21/quickref/#readable
[26] Authoring tool accessibility guidelines (ATAG) 2.0. (n.d.). World Wide Web Consortium (W3C). https://www.w3.org/TR/ATAG20

2. **Content appears and operates in predictable ways.** Many people rely on predictable user interfaces and are disoriented or distracted by inconsistent appearance or behavior. Examples of making content more predictable include:
    - Navigation mechanisms that are repeated on multiple pages appear in the same place each time
    - User interface components that are repeated on web pages have the same labels each time
    - Significant changes on a web page do not happen without the consent of the user

Accessibility Requirements related to Predictability

Standards/ Guidelines	Specific
WCAG	Guideline 3.2 - Predictable[27] Make Web pages appear and operate in predictable ways. 3.2.1 On Focus. When any user interface component receives focus, it does not initiate a change of context. 3.2.2 On Input. Changing the setting of any user interface component does not automatically cause a change of context unless the user has been advised of the behavior before using the component. 3.2.3 Consistent Navigation. Navigational mechanisms that are repeated on multiple Web pages within a set of Web pages occur in the same relative order each time they are repeated unless a change is initiated by the user. 3.2.4 Consistent Identification. Components that have the same functionality within a set of Web pages are identified consistently. 3.2.5 Change on Request. Changes of context are initiated only by a user request or a mechanism is available to turn off such changes.
UAAG	Guideline 3.3 - Predictable[28]
ATAG 2.0[29]	Principle A.1: Authoring tool user interfaces follow applicable accessibility guidelines Guideline A.3.3: (For the authoring tool user interface) Help authors avoid flashing that could cause seizures Part B. Support the production of accessible content

3. **Users are helped to avoid and correct mistakes.** Forms and other interactions can be confusing or difficult to use for many people, and, as a result, they may be more likely to make mistakes. Examples of helping users to avoid and correct mistakes include:
    - Descriptive instructions, error messages, and suggestions for correction
    - Context-sensitive help for more complex functionality and interaction
    - Opportunity to review, correct, or reverse submissions if necessary

[27] How to meet WCAG (Quickref reference). (n.d.). World Wide Web Consortium (W3C). https://www.w3.org/WAI/WCAG21/quickref/#predictable
[28] User agent accessibility guidelines (UAAG) 2.0. (n.d.). World Wide Web Consortium (W3C). https://www.w3.org/TR/UAAG20/#gl-predictable-operation
[29] Authoring tool accessibility guidelines (ATAG) 2.0. (n.d.). World Wide Web Consortium (W3C). https://www.w3.org/TR/ATAG20

Accessibility Requirements related to Input Assistance

Standards/ Guidelines	Specific
WCAG	Guideline 3.3 – Input Assistance [30] Help users avoid and correct mistakes. 3.3.1 Error Identification. If an input error is automatically detected, the item that is in error is identified and the error is described to the user in text. 3.3.2 Labels or Instructions. Labels or instructions are provided when content requires user input. 3.3.3 Error Suggestion. If an input error is automatically detected and suggestions for correction are known, then the suggestions are provided to the user, unless it would jeopardize the security or purpose of the content. 3.3.4 Error Prevention (Legal, Financial, Data) 3.3.5 Help. Context-sensitive help is available. 3.3.6 Error Prevention (All)
UAAG	Guideline 3.1 - Mistakes[31]
ATAG 2.0[32]	Principle A.1: Authoring tool user interfaces follow applicable accessibility guidelines Guideline A.2.2: (For the authoring tool user interface) Ensure that editing-view presentation can be programmatically determined Guideline A.4.1: (For the authoring tool user interface) Help authors avoid and correct mistakes Part B. Support the production of accessible content

D. Robust content and reliable interpretation

1. **Content is compatible with current and future user tools.** Robust content is compatible with different browsers, assistive technologies, and other user agents. Examples of how this can be achieved include:
   - Ensuring markup can be reliably interpreted, for instance by ensuring it is valid
   - Providing a name, role, and value for non-standard user interface components

Accessibility Requirements related to Compatibility

Standards/ Guidelines	Specific
WCAG	Guideline 4.1 – Compatible [33] Maximize compatibility with current and future user agents, including assistive technologies. 4.1.1 Parsing. In content implemented using markup languages, elements have complete start and end tags, elements are nested according to their specifications, elements do not contain duplicate attributes, and any IDs are unique, except where the specifications allow these features. 4.1.2 Name, Role, Value. For all user interface components (including but not limited to: form elements, links, and components generated by scripts), the name and role can be programmatically determined; states, properties, and values that can be set by the user can be programmatically set; and notification of changes to these items is available to user agents, including assistive technologies.

[30] How to meet WCAG (Quickref reference). (n.d.). World Wide Web Consortium (W3C). https://www.w3.org/WAI/WCAG21/quickref/#input-assistance
[31] User agent accessibility guidelines (UAAG) 2.0. (n.d.). World Wide Web Consortium (W3C). https://www.w3.org/TR/UAAG20/#gl-avoid-mistakes
[32] Authoring tool accessibility guidelines (ATAG) 2.0. (n.d.). World Wide Web Consortium (W3C). https://www.w3.org/TR/ATAG20
[33] How to meet WCAG (Quickref reference). (n.d.). World Wide Web Consortium (W3C). https://www.w3.org/WAI/WCAG21/quickref/#compatible

Standards/ Guidelines	Specific
	4.1.3 Status Messages. In content implemented using markup languages, status messages can be programmatically determined through role or properties such that they can be presented to the user by assistive technologies without receiving focus.
UAAG	Guideline 2.6 – Preference Settings [34] Guideline 4.1 - Assistive technology Guideline 5.1 - Follow specifications
ATAG 2.0[35]	Principle A.1: Authoring tool user interfaces follow applicable accessibility guidelines Part B. Support the production of accessible content

In the early stage of website project development, it is effective to include accessibility factors to avoid re-doing your work during the website development process.

Supplementary Learning Resources

1. Accessibility - W3C. (n.d.). World Wide Web Consortium (W3C). Retrieved July 1, 2020, from https://www.w3.org/standards/webdesign/accessibility
2. Frequently asked questions (FAQ). (n.d.). The Web Standards Project. https://www.webstandards.org/learn/faq/#p21
3. Tomczyk, C. (2017, August 30). Web accessibility: Why W3C standards are often ignored. Toptal Engineering Blog. https://www.toptal.com/front-end/web-accessibility-and-w3c-standards
4. What are web standards? Why are they important? (n.d.). Genesee County Michigan Web Designer Developer | SOS Web Design LLC. https://www.soswebdesign.com/gallery/webstandards.cfm

[34] User agent accessibility guidelines (UAAG) 2.0. (n.d.). World Wide Web Consortium (W3C). https://www.w3.org/TR/UAAG20/#gl-store-prefs
[35] Authoring tool accessibility guidelines (ATAG) 2.0. (n.d.). World Wide Web Consortium (W3C). https://www.w3.org/TR/ATAG20