

Accessibility standards and best practices for digital product development: A guide for suppliers and implementation partners at WHO

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Digital Accessibility Resource Center (UNDIS Indicator 6.3)

**Frontier Technologies & Data
Information Management & Technology**

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Glossary

Accessible Rich Internet Applications (ARIA):	Practices that enhance web accessibility, particularly important for components relying on advanced JavaScript interactions
Digital accessibility:	Creating products, websites, tools, and technologies that are accessible to people with disabilities involves making them perceivable, operable, understandable, and robust (POUR). This ensures that content is accessible through at least one sense, usable in multiple ways, clear in meaning and operation, and compatible with any device or assistive technology.
Cascading Style Sheets (CSS):	CSS is a stylesheet language used to describe the presentation of a document written in HTML or XML. CSS defines how elements should be rendered on screen, on paper, in speech, or on other media.
Color contrast	the perceived difference between two or more adjacent colors. Two colors from different segments of the color wheel are contrasting colors.
Screen reader	Software programs that allow blind and low vision users to access the text that is displayed on a screen with a speech synthesizer or Braille display.
Voluntary Product Accessibility Template (VPAT):	A document that outlines how a product conforms to accessibility standards like WCAG.
Web Content Accessibility Guidelines (WCAG):	A set of guidelines developed by the W3C to ensure digital content is accessible to people with disabilities
World Wide Web Consortium (W3C):	An international public-interest non-profit organization that develops Web standards.
<u>WHO Brand Guideline</u>	The World Health Organization Brand Guideline includes a list of colors to be used in digital communication

Introduction

The World Health Organization is committed to creating digital products that are accessible and inclusive for everyone, including persons with disabilities. This document outlines our expectations and guidance for suppliers and implementation partners working with WHO to develop and implement digital products. It seeks to ensure that all parties are aligned with WHO's vision, objectives, and quality standards to develop digital products that are both accessible and user-friendly, catering to a broad and diverse audience.

What we expect

We want to collaborate with suppliers who share our aspiration to create accessible and inclusive products. Here's what we expect from you:

- **Accessibility expertise:** Suppliers should have a good understanding of the Web Content Accessibility Guidelines (WCAG) and proven experience in applying accessibility best practices.
- **Training and commitment:** Your team must be trained in accessibility standards and demonstrate a strong commitment to integrating these principles into your work.
- **Testing:** Conduct regular accessibility testing using both automated tools and real users with disabilities. Provide clear and thorough documentation on the accessibility features of your products.
- **Open communication:** We believe in maintaining open and ongoing communication to collaboratively address any accessibility issues throughout the project.
- **Documenting accessibility:** To ensure transparency and accountability, we require our suppliers to produce a Voluntary Product Accessibility Template (VPAT) for major digital product deliverables, and for smaller deliverables provide a statement to confirm your verification results and conformance. A VPAT is a standard document that outlines how a product conforms to accessibility standards like WCAG. It details which specific WCAG criteria are met and identifies any areas where the product might not be fully accessible.

Additional information

To empower our suppliers and implementation partners on their accessibility journey, we guide you towards pertinent resources and materials on WCAG and best practices to enhance your accessibility knowledge. We promote a culture that prioritizes accessibility and the need for continuous improvement.

If you are working inside WHO, you can visit the WHO [Digital Accessibility Resource Center](#) for further information (the portal is **only** available to people working with WHO system credentials/email address). For any queries, you can send an email to fd@who.int.

Our shared commitment

As a supplier or implementation partner at WHO, it's crucial that we jointly seek:

- **WCAG compliance:** We aim meet the WCAG 2.1 Level AA conformance levels as a minimum requirement, striving for WCAG 2.2 Level AA compliance where feasible for all our digital products.
- **Early integration:** Accessibility is considered from the very beginning of planning and design, not as an afterthought.
- **User-centered design:** Consider the whole user experience, including the different user personas, their tasks, environment, and the entire workflow of a product or service.

Public reference materials such as the WCAG 2.1 guidelines, techniques, Accessible Rich Internet Applications (ARIA) practices, and World Wide Web Consortium (W3C) tutorials offer valuable insights for compliance. For more detailed guidance, visit the [W3C Web Accessibility Initiative \(WAI\) website](#).

WHO may conduct accessibility audits on products supplied to us. This is to ensure that all products are compliant with our accessibility standards and verify the accuracy of the provided Voluntary Product Accessibility Templates (VPATs).

In the event of non-conformance with our accessibility standards, and reluctance to implement necessary corrections, we must emphasize that there may be implications affecting future assignments and our ongoing business relationship.

Best practices and general guidance

Below are some best practices and guidance for incorporating digital accessibility into product development. Resource references are open source and do not require internal access to WHO systems.

1. Digital accessibility must meet a minimum of WCAG 2.1 AA level.

1.1 Reference materials regarding compliance with WCAG 2.1 guidelines include:

- [Web Content Accessibility Guidelines \(WCAG\) 2.1](#) is a set of guidelines developed by the W3C to ensure that digital content is accessible to people with disabilities. It covers various aspects of web, mobile design and development, providing recommendations to make websites and web applications more usable for individuals with different disabilities, including visual, auditory, cognitive, and motor impairments.
- [WCAG Techniques](#) – description of possible techniques to meet specific WCAG 2.1 guidelines
- [UAAG 2.0](#) – principles, guidelines, and success criteria can be applied to mobile web content, mobile web apps, native apps, and hybrid apps using web components inside native app

1.2 During the design of typical interface elements, such as menus, navigation, modal windows, forms, breadcrumb navigation, tables, carousels, etc., the supplier should use design patterns and best practices described on the following resources:

- [ARIA practices](#)
- [W3C tutorial](#)

Follow the general principles defined in the [WHO Brand Guidelines](#) for the usage of logo and colors

2. Tools supporting the development and testing of digitally accessible services.

The tools listed below support the creation of digitally accessible content and allow for early detection of some issues related to digital accessibility. However, it is important to note that automated tools do not identify all non-compliances with WCAG 2.1.

2.1 List of tools:

- [NVDA](#), [JAWS](#), VoiceOver – screen reader software applications designed to assist individuals with visual impairments in accessing and interacting with digital content, including websites and applications. VoiceOver is a built-in tool in Apple products.
- [ARC Toolkit](#) – Chrome browser extension supporting page code examination
- [ANDI](#) – bookmarklet for Chrome/EDGE/Firefox/Safari/Internet Explorer browser. ANDI is a useful tool for web developers and designers who are committed to creating accessible web content in compliance with accessibility standards, such as

the Web Content Accessibility Guidelines (WCAG). It aids in identifying areas that may need improvement to enhance a website's overall accessibility.

- [Colour Contrast Analyser](#) – tool for verifying the contrast of page elements

3. Detailed guidelines on accessibility

The following section of the documentation focuses on key aspects of ensuring the digital accessibility of a website. It is important to emphasize that these guidelines assist the supplier in implementing essential WCAG 2.1 guidelines but do not serve as an exhaustive or authoritative compilation of methods to ensure compliance with the WCAG 2.1 standard.

3.1 Semantic quality of HTML code

The fundamental condition for accessibility is the correct and appropriate use of HTML tags. In simple terms, the content must be implemented in full compliance with the [HTML5 specification](#).

Examples of semantic correctness:

- Links should be created using the `<a>` tag.
- Headings should be created using the `<h1>...<h6>` tags.
- Buttons should be created using the `<button>` or `<input type="button">` tags.
- Lists should be created using the `` / `` and `` tags for individual items.
- Dropdown lists in forms should be created using the `<select>` / `<option>` tags.

Examples of semantic errors:

- Link created using `` (JavaScript scripted).
- Header `<p class="heading">`.
- Dropdown list in a form created using `` / `` list tags.

3.2 Semantic enhancements using ARIA

ARIA attributes must complement the HTML semantics. This technology is primarily intended for users of screen readers and is particularly important in components of websites that rely on advanced JavaScript interactions.

The application of ARIA attributes can be divided into two parts:

- Enhancing the main blocks of the WWW with orientation points.
- Additions to forms or components such as carousels, tabs, dropdown menus, expandable blocks, modal windows, alerts, sliders, etc.

The primary source of information on ARIA usage should be the [ARIA Techniques](#).

3.3. Page titles

All page titles of the page must be automatically generated based on information that allows the user to understand the content of a given page.



Examples:

- The homepage of the website should have the title - "World Health Organization (WHO) homepage."
- The page "Operation" should have the title - "Operation - World Health Organization (WHO)."

All pages should have titles following the principle of "from specific to general."

The specific details regarding how many elements of the path should be visible in the title will be subject to agreement during discussions with the supplier:

- Page title + service/page name or
- Page title + department name + e.g., name of the parent department + service/page name.

In accordance with the Requirements for the Content Management System (CMS), the description of additional CMS modules and functionalities, and CMS of the Service/Page -

the Editor must have the ability to individually define the content of the meta-Title attribute, regardless of the editorial title.

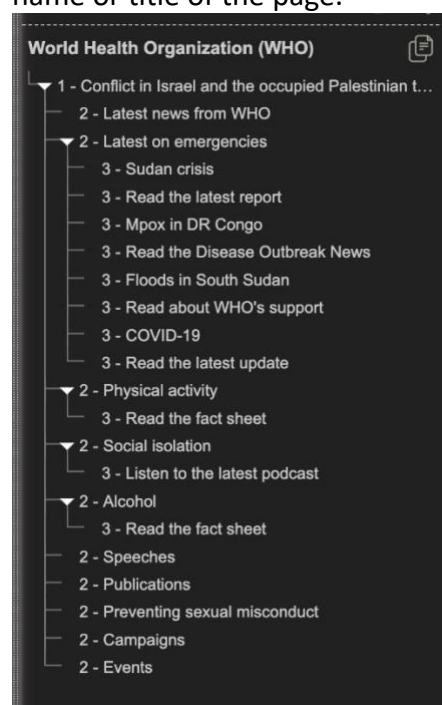
3.4. Marking the language of the page and content

The natural language of the content on the page should always be marked with the appropriate lang attribute. For English-language pages, the tag should be lang="en". Additionally, editors of the Service/Page should have the capability in the WYSIWYG editor to mark any character sequence with this attribute.

```
<!DOCTYPE html>  
<html lang="en-GB">
```

3.5. Headers for editor

Editors should be able to set an appropriate heading structure for pages. The available headers for editors should range from h2 to h6. The h1 header should be reserved for the name or title of the page.



3.7. Links

In the digital product, all links should be understandable out of context, either textually or visually. In the permanent sections of the digital product, this may entail the need to supplement short links with additional descriptive content. Examples of links that could be supplemented with additional content include: "close," "scroll," "next," "previous," "more,"

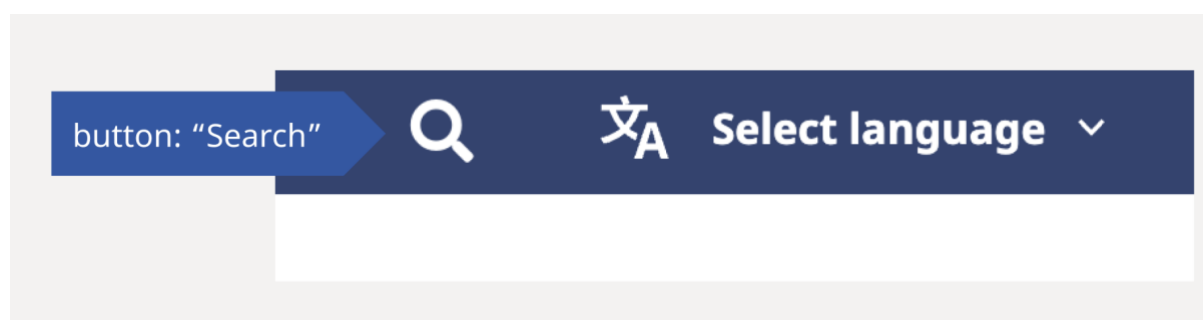
"download," etc. or consider replacing them with something that directly informs what will happen upon clicking.

3.8. Alternative descriptions

All images included in templates using the tag should have the alt attribute.

In the case where the image conveys no content (decorative images), they should be placed using CSS, utilizing the background-image property. Another method is to add an empty alt to —using the alt="" notation.

- If the image conveys content, the alt should be supplemented with an appropriate description.
- If the image is a link, the alternative description should convey the function of the link, as if it were a text link.



3.9. Tables

For tables, it is crucial to use the appropriate HTML syntax and semantics. Screen readers provide good support for table handling. [Guidelines on creating accessible tables](#).

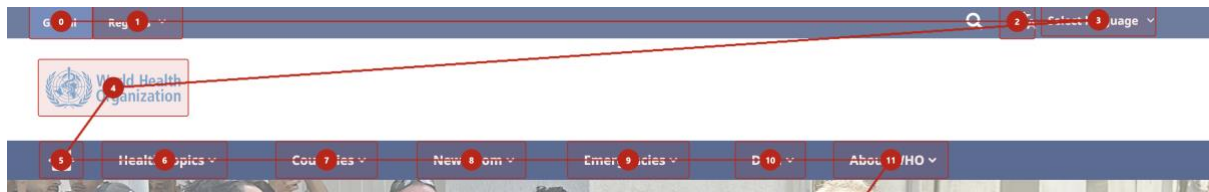
3.10. Keyboard operation of the service/page

While correct use of HTML semantics should ensure keyboard accessibility, it is essential to ensure flawless operation during implementation.

Developers must manage keyboard focus through JavaScript in a way that avoids creating a keyboard trap. Such an error causes difficulties for users with mobility impairments and those using screen readers.

3.11. Focus order

The keyboard focus should adhere to the rule of either moving from left to right and top to bottom, or from right to left, depending on the context. For instance, following keyboard navigation through the main menu, the focus should shift to either the main content block or the left column.



3.12. Hiding content

Sometimes, it is necessary to define content that is not based on ARIA, but rather on HTML, using CSS to visually hide content while ensuring it remains accessible to screen readers and other assistive technologies. [Content hiding techniques](#).

3.13. Form security

It is crucial that forms are secured in a way that does not create barriers or discomfort for users. In this case, caution is required with solutions like CAPTCHA. Such security measures often fail to ensure accessibility for all users. Whenever possible, spam filtering and unwanted actions should be handled on the server side or in a way invisible to the user.

3.14. Filter/reload operations

Any actions related to reloading the view, such as filtering, sorting, or searching, must be well-tested with screen readers. In such situations, non-visual operation comfort is crucial. Users should always have full knowledge of the interface's operation and be aware that the page content has been updated. It is also advisable to adhere to the general principle that changes to the page content without reloading are only applied in justified situations. In some cases, automatic title changes may be necessary after a filter change.

3.15. Operation in high contrast mode

The Service/page should seamlessly operate in Windows/Mac/Linux high contrast mode. The supplier should conduct ongoing testing for this during implementation. Common issues in this mode may be related to the use of CSS text replacement for images. Therefore, in some cases, using typical graphic links `<a>` may be necessary instead of this technique. Follow the WHO Brand Guidelines for colours.

3.16. Skip to content

Every page of the Service/Page should have functioning "Skip to Content" links that assist in jumping focus directly to the main functionality of the page. Typically, this will involve skipping the header block along with breadcrumbs. After jumping, the focus should

generally start around the <h1> header - the content of the page.

Skip to content



3.17. Responsiveness (RWD)

The Service/page should be built with a focus on mobile devices, which increasingly play a crucial role in consuming online content. The Service/page should be constructed based on the best and current practices for creating responsive websites. The supplier must prepare all graphic designs using responsive breakpoints for various device types (standards):

- **Smartphone** – with a resolution of 360x640 (average value) in both portrait and landscape versions (considering a minimum value of 320 px),
- **Tablet** - with a resolution of 768x1024 in both portrait and landscape versions,
- **Computer monitor/Laptop** - with a resolution of 1366x768 (average value), considering a minimum value of 900 px and a maximum value of 1920 px.

During implementation, pay cautious of preventing overlaps of objects or obstruction of content and functions, particularly at smaller scales. For mobile design, it is essential to account for a minimum font size of 14/16px to maintain legibility.

3.18. Operation with assistive software

The operation of the Service/Page will be tested using:

- Screen readers – e.g. NVDA, Jaws, VoiceOver
- Magnifiers,
- Windows/MacOS/Linux high contrast mode,
- Switch devices,
- Mobile devices with Android/iOS systems.

3.19. Ability to resize the screen

The concept of the Service/Page includes the ability to freely resize the page (Ctrl ++ and Ctrl +-). At every screen width/level of zoom (not just dedicated to tablets and smartphones), all content, and functions of the Service/Page should be available in a readable form. The graphic design must allow for the programming of the Service/Page in this way.

3.20. Moving elements

Moving elements in the Service/Page are permissible but only in conjunction with a button that allows the user to stop this movement and restart it. No element of the Service/Page should flash.

3.21. Multimedia

All multimedia content must comply with accessibility standards, ensuring compatibility with screen readers, alternative text for visual content, captioning for videos, and audio descriptions where necessary.

Annex: Context of WHO's commitment to digital accessibility

The United Nations Disability Inclusion Strategy aims to ensure full disability inclusion across the UN's work. It aligns with the Convention on the Rights of Persons with Disabilities and focuses on policy integration, enhanced representation, accessibility, and data collection. This initiative is a key step towards global equity and the empowerment of persons with disabilities.

This strategy requires UN entities to integrate disability inclusion into all aspects of their operational and programmatic work. It consists of a system-wide policy, an entity accountability framework with 15 common indicators, and an accountability scorecard, against which entities report on an annual basis.

Following the UNDIS adoption, on 3 December 2020, the WHO Director General Tedros Adhanom Ghebreyesus launched the [WHO Policy on Disability](#) and the WHO UNDIS Action Plan.

The UNDIS Indicator 6.3 mandates integrating digital accessibility into our way of working and culture. Embracing an inclusive online experience supports WHO's mission and is an important requirement that must be adhered to by all, including suppliers and partners that work at WHO.

Digital accessibility involves designing digital content and products to enable effective access and use for persons with disabilities. It ensures perceivable, operable, understandable, and robust content for all users. As technology becomes an integral part of our daily lives, it is vital to support a digitally accessible ecosystem.

Annex: Quick reference tip sheet for different roles

Each role within a project or product development team can contribute to creating a more accessible and inclusive digital experience. Consider these important elements when implementing digital solutions:

For project managers / product owners

- **Contract requirements:** Ensure accessibility requirements are clear in contracts and agreements.
- **Plan early:** Include accessibility in project scope and timelines.
- **Budget allocation:** Allocate budget for accessibility testing and improvements.
- **Set standards and communicate goals:** Follow Web Content Accessibility Guidelines (WCAG) guidelines, ensure the team understands the importance of accessibility, and track accessibility metrics to measure progress.
- **Cross-functional collaboration:** Foster collaboration between designers, developers, testers, and content creators to address accessibility comprehensively.
- **Regular testing:** Schedule both automated and manual accessibility tests.
- **User involvement:** Include users with disabilities in testing phases.
- **Documentation:** Maintain clear records of accessibility practices and decisions.
- **Iterate:** Conduct post-launch reviews and iterate based on feedback.

For designers

- **Color contrast:** Use tools to ensure high contrast between text and backgrounds.
- **Heading structure:** Use headings (h1, h2, etc.) in a logical, hierarchical order.
- **Alt text for images:** Provide descriptive alt text for all images.
- **Semantic:** ensure that distinguish links/buttons.
- **Keyboard focus styles:** Ensure visible focus indicators for all interactive elements.
- **Responsive design:** Design with various devices and screen sizes in mind.
- **Text resizing:** Ensure content is readable when text is resized up to 200%.

For developers

- **Keyboard navigation:** Ensure all interactive elements are accessible via keyboard (tab, enter, space keys).
- **Screen reader compatibility:** Test with screen readers (e.g., NVDA, VoiceOver).
- **Accessible Rich Internet Applications (ARIA) roles:** Implement ARIA roles and landmarks appropriately.
- **Cascading Style Sheets (CSS) deactivation:** Disable CSS to verify the document's structure remains understandable.
- **Form labels:** Ensure all form fields have associated labels.
- **Error handling:** Provide clear, descriptive error messages with correction suggestions.

For content creators

- **Alt text:** Write meaningful alt text for all images.
- **Descriptive links:** Use clear and descriptive link text.
- **Headings:** Use headings to organize content logically.
- **Plain language:** Write in clear, simple language.
- **Transcripts and captions:** Provide transcripts for audio content and captions for video content.
- **Content structure:** Use lists, bullet points, and other formatting tools to organize content clearly.

For QA/testers

- **Automated testing:** Use tools like Axe, WAVE, and Lighthouse for initial testing.
- **Manual testing:** Conduct manual tests for keyboard navigation, screen reader compatibility, and color contrast.
- **User testing:** Include feedback from users with disabilities in testing phases.
- **Accessibility reports:** Generate and review accessibility reports to identify issues.
- **Regression testing:** Regularly test for accessibility regressions, especially after updates.