1. Web accessibility. The WAI

Today, accessibility is essential to guarantee equal opportunities, regardless of the capabilities or circumstances of each person.

1.1. What is web accessibility

Web accessibility aims to make web pages usable by the greatest number of people possible, regardless of their abilities, knowledge and technical characteristics of the device with which they access the web.

The World Wide Web Consortium (W3C) is committed to bringing the web to its full potential, including promoting a high degree of usability for people with disabilities. is the acronym in English for Web Accessibility Initiative) is the working group in charge of this commitment and develops its work through a process based on consensus.

WAI's work focuses on:

- Make web pages and browsers accessible.
- Promote that web creation tools generate accessible content.
- Improve tools for evaluating and correcting accessibility problems.
- Disseminate and carry out training in accessible design.
- Serve as a reference in development and research on accessibility.

To achieve these objectives, it is responsible for drafting a series of guidelines:

- **WCAG** (Web Content Accessibility Guidelines): web content accessibility guidelines.
- **ATAG** (Authoring Tools Accessibility Guidelines): Accessibility guidelines for authoring tools and accessibility assessment.
- **UAAG** (User Agent Accessibility Guidelines): accessibility guidelines for user agents (web browsers, video players and technical aids such as screen readers)

1.1.1 Web Content Accessibility Guidelines WCAG

These guidelines and success criteria are structured into three levels of conformity:

Level A – Covers the most basic accessibility features for the web. The inclusion of these functions is essential to guarantee accessibility for people with different types of disabilities.

Level AA – is an extension of basic accessibility features that addresses the most common and serious accessibility obstacles. Compliance with checkpoints can help you eliminate a number of important barriers to accessing information on the web.

Level AAA – This is the highest level of web accessibility and aims to eliminate all web accessibility obstacles for people with disabilities.

1.1.2 The ATAGs

These guidelines and success criteria are structured into three levels of conformity:

Authoring tools are programs and services that "authors" (web developers, designers, writers, etc.) use to produce web content (web pages, applications, etc.). The Accessibility Guidelines for Authoring Tools (ATAG) provide guidelines for:

- Make creation tools accessible so that people with disabilities can create web content.
- Help authors create more accessible web content by promoting WCAG-compliant content production.

ATAGs are primarily intended for developers of authoring tools, including the following types of tools:

- Tools to create web pages, WYSIWYG (what you see what you get) HTML editors.
- Software to generate websites, such as content management systems (CMS) and learning management systems (LMS), content aggregators…
- Word processors and other document creation applications that export to HTML or EPUB.
- Multimedia creation tools.
- Websites that allow users to add content, such as blogs, wikis, photo sharing sites, online forums or social networks.

1.1.3 The UUAGs

The User Agent Accessibility Guidelines (UUAG) documents provide guidance on making user agents accessible to people with disabilities. User agents include browsers, browser extensions, media players, screen readers, and other applications. that represent web content.

1.2. Web accessibility: essential for some, useful for all

According to OMS data, approximately 15% of the world's population suffers from some type of disability. Although not all types of disabilities pose a difficulty in accessing the Internet, we must not forget that accessibility does not only benefit people with disabilities, but it is useful for everyone.

An accessible web design allows all **people to perceive, understand, navigate and interact with the website**.

Another benefit that accessibility provides is that many accessibility techniques also improve **indexability** (the ease with which search engines can access all the content on the web and classify it in their index) and **search engine positioning** (the relative position that accessible pages obtain in the search engine index).

Keyboard Compatibility

Not being able to use the computer because the mouse doesn't work is frustrating. Many people use only the keyboard to navigate websites, whether out of preference or some other circumstance. Whether it is a temporary problem of reduced mobility, a permanent physical disability or simply a broken mouse, the result is the same. That's why websites and apps must be completely usable via keyboard.

https://www.youtube.com/watch?v=93UgG72os8M

Colors with good contrast

Good designs usually go practically unnoticed, but a small design error can make the result confusing and frustrating for the user. Choosing colors with poor contrast makes browsing, reading, and interacting an absolute nightmare. A good design includes sufficient contrast between the background and foreground colors. This doesn't just include text and images, but links, icons and buttons: if it's important enough to be seen, it should be clear. This is essential for people with low contrast sensitivity, a problem that becomes more common as we age. With well-chosen colors that respect contrast criteria, websites and applications can be easier to use in more situations. A very clear example with the mobile phone occurs when the ambient lighting is very intense (such as in full sunlight).

https://www.youtube.com/watch?v=Hui87z2Vx8o

Clear layout and design

Poor organization of elements on the web can be very frustrating. A good organization of the elements is essential for a good design and implies a better user experience. Clear headers, navigation bars and a consistent style are a win-win, as any user experiences frustration with a complex presentation that makes it difficult or impossible to find information for people with visual impairments, cognitive disabilities or a learning disorder, which makes them need a clear and coherent presentation.

https://www.youtube.com/watch?v=tfkzj5VC9P8

Large links, buttons and controls

Trying to hit a very small white space requires a lot of effort. But on the web, interactive areas may be easier to use. This is very useful on mobile devices, since we use them with our fingers, sometimes we even do it while we move. Furthermore, this issue is fundamental for people who, due to their conditions, have less skill.

https://www.youtube.com/watch?v=CzfKB3PuulY

Text to speech conversion

Some people cannot see the text on the screen. Fortunately, computers can convert text to speech. Many blind people have relied on text to speech technology for years, but it is also important for many people with dyslexia. In addition, it is very useful for people who have difficulty reading text, or even for those who like to multitask. For this to work, however, web pages and applications must be properly coded. This also has a great advantage: it helps search engines better index the contents of websites.

https://www.youtube.com/watch?v=8Rn5pXCdZWU

Voice recognition

Imagine if you could only communicate with your family in writing. Isn't it sometimes easier to talk? One of the advances in technology is speech recognition, whether it is used for a web search, dictating emails or controlling a navigation application. Many people with physical disabilities rely on voice recognition to use their computer, but for this to be possible web pages and applications must be correctly encoded. Voice recognition can also help other users with temporary limitations, such as an arm in a cast, or people who simply prefer to use their voice.

https://www.youtube.com/watch?v=7RHG_XiQ0ck

Video captions

Video is not only moving images, but also contains sound. Without the audio, we would have to guess what a movie is about. Frustrating, right? This is the situation of everyone who does not feel. Subtitles make videos accessible to everyone. And this is also useful for people who want to watch videos in noisy environments or in places where it is necessary to be quiet.

https://www.youtube.com/watch?v=iWO5N3n1DXU

Customizable text

What is optimal for one person is not necessarily optimal for another. Customization is not always a matter of preference; sometimes it is a necessity. Being able to adjust how text is presented is crucial for people with low vision and dyslexia. Properly coded web pages and applications allow you to customize text and change, for example, size, line spacing, font, and colors without loss of functionality or clarity.

https://www.youtube.com/watch?v=rbiI65Jcz5s

Understandable content

Websites that do not structure content clearly, with headings, lists and separations, or that use overly complex language are difficult to understand for many people, including not only people with cognitive and learning disabilities, but also people who do not have the language of the text as their first language.

https://www.youtube.com/watch?v=BYRxF2yInfA

Notifications and feedback

Without clear notifications and feedback in response to user actions, people easily become disoriented and confused. Sometimes the error messages are not clear enough. Making them understandable is usually quite simple. Making web pages and applications predictable and understandable makes them accessible to people with cognitive disabilities and learning disorders and, at the same time, makes them more usable for everyone, especially for those with less computer skills.

https://www.youtube.com/watch?v=E1fEv4Vpexg

1.3. False myths about web accessibility

Web accessibility is often perceived as an impediment by some web developers and designers who do not know its advantages, nor do they know the tools and techniques that allow making a website usable by everyone. Most popular myths about accessibility:

People with disabilities do not use the web:

Fake. Quite the opposite: new technologies and the Internet have allowed many people with disabilities to lead autonomous and independent lives.

Text-only web pages are accessible.

Fake. These types of pages can be difficult to understand for people with some type of cognitive disability.

Accessibility is expensive.

Fake. Obviously, adapting an existing non-accessible website to make it accessible has a cost, but so does any other adaptation (for example, having a responsive design). To minimize this cost, it is very important to take accessibility guidelines into account from the beginning of the project.

Accessibility is only for the blind.

Fake. There are many types of disabilities that can present access problems to the multiple functionalities and contents that we have available on the Internet today.

Accessibility is incompatible with good design.

Fake. There are several variants of this statement, such as "accessible websites kill creativity" or "web accessibility implies restrictions in web design." Here you can see some examples that prove this argument to be false: Parramatta Park, Nomensa.com or Deque.com.

Accessibility is only for people with disabilities.

Fake. You have already seen this through the videos in the "Web accessibility: essential for some, useful for all" section.

2. Most common accessibility problems and technical aids

Everyone is unique, and we have various abilities, skills, preferences, expectations and temporary situations that can influence the way we use the web:

Aging: many people develop age-related decline

Multiple Disabilities: Some people suffer from multiple types of disabilities, which can limit them when interacting with the web. For example, someone who is deaf and has low vision may benefit from subtitles, but only if they can be adjusted in size and color.

Health conditions: Some people have health problems that can affect their stamina, dexterity, or concentration. For example, some people may experience fatigue

Temporary disabilities: Some people experience temporary disabilities as a result of, for example, an accident, an operation, or medication.

Context-related limitations: We may sometimes experience limitations due to context. For example, in a very noisy context you cannot hear audio well.

2.1. Hearing limitations

These are some of the barriers that people with hearing limitations may encounter:

- Content with audio (videos and audios) without transcriptions or subtitles.
- Video players that do not display subtitles or provide audio controls.
- Video players that do not allow you to adjust the size and color of the subtitle text.
- Services and web applications that base interaction solely on the use of voice.
- There is a lack of sign language to complement important information or difficult-to-read text.

2.2. Cognitive, neurological and learning-related limitations

People with cognitive or neurological disabilities or who suffer from learning disorders may encounter barriers such as:

- Complex navigation mechanisms and complex layouts that are difficult to understand and use.

- Complex sentences that are difficult to read and unusual words that are difficult to understand.
- Long fragments of text without images, graphics or other elements of context.
- Content with visual flickers and background audio that cannot be muted.
- Browsers and video players that do not provide controls to stop animations or mute audio.
- Visual layouts that cannot be adapted using browser controls or custom style sheets.

2.3. Physical limitations

People with physical disabilities often encounter barriers such as:

- Web pages, web browsers, and authoring tools that do not provide full keyboard support.
- Insufficient time to respond or complete tasks, such as filling out online forms.
- Controls including links in images or text, which do not provide alternative texts.
- Lack of visual and non-visual orientation elements, and navigation aid elements.
- Inconsistent, unpredictable or overly complicated navigation mechanisms and page functions.

2.4. Speech-related limitations

Speech-related disabilities involve difficulty producing speech that is recognizable by others or by voice recognition software.

Some of the barriers that people with speech-related limitations encounter are:

- Web application-based services that rely on interaction and use voice only.
- Websites that only offer telephone numbers as the only means of communicating with the organization.

2.5. Visual limitations

The following elements constitute barriers for people with different types of visual disabilities:

- Images, controls, and other structural elements that lack equivalent text alternatives.
- Text, image, and page layouts that do not allow resizing or that lose information when resizing.
- It lacks guidance cues, both visual and non-visual, page structure issues, and lack of navigation aids.
- Video content that does not offer text or audio alternatives or an audio description track.
- Inconsistent, unpredictable or overly complicated navigation mechanisms and page functions.
- Text and images with insufficient contrast between foreground and background color combinations.
- Websites, web browsers, and authoring tools that do not support the use of custom color schemes.
- Websites, web browsers, and authoring tools that do not provide full keyboard support.

2.6. Technical aids

People who suffer from some type of disability use special devices or specific software that helps them perform various tasks, from browsing the Internet to using the computer or communicating with others. All these software and hardware tools are generically called technical aids or assistive technologies.

2.6.1 Screen readers

A screen reader is software used by people who are blind or visually impaired to read the content on their screen.
JAWS Screen Reader (Windows)
NVDA Screen Reader (Windows)
VoiceOver Screen Reader (Mac)

The interpretation made by the screen reader can be presented to the user in different ways, either through text-to-speech synthesizers or with braille output.

https://www.youtube.com/watch?v=dEbl5jvLKGQ

2.6.2 Text readers

A text reader is a type of software used by people with different types of learning disorders that affect their ability to read text.

The software used by text readers reads the text with a synthesized voice but does not read elements such as menus or other types of elements, but only the body of the text.

2.6.3 Screen Magnifiers

Screen magnification software allows users to control the size of text or graphics that appear on the screen. Unlike the zoom function of browsers, this type of software allows you to see the text enlarged in relation to the rest of the screen. This is done by emulating a handheld magnifying glass on the screen.

2.6.4 Voice input software

Voice input software provides people with typing difficulties with an alternative method of entering text and also controlling the computer.
Examples of this type of software are Dragon Naturally Speaking, available for Windows or Mac. Although Windows and Mac have speech recognition utilities, these utilities cannot be used to browse the web.

2.6.5 Alternative input devices

Some users cannot use the mouse or keyboard to work with the computer. These individuals may use various types of devices, such as eye movement tracking devices, single-switch input devices, and head pointers.

Motion tracking or eye tracking software includes devices that can look at a target, or even the user's eyes, to interpret where they want to place the mouse pointer. The software moves the pointer instead of the user.

Single switch input devices can be used in conjunction with other alternative devices or on their own. They are typically used with on-screen keyboards.

https://www.youtube.com/watch?v=ucU0vCr0rW8

Trackballs or ball mice are used by people with mobility problems.

A head pointer consists of an object that is mounted directly above the user's head and can be used to press keyboard keys. It is used by people who cannot use their hands.

2.6.6 Browser extensions

Some browsers, such as Google Chrome, have a repository of extensions that allow you to expand the browser's functionalities. An entire category of Google Chrome extensions is dedicated to accessibility.

This is the case of these two extensions:

- OpenDyslexicFont for Chrome – Activating this extension changes the web font to OpenDyslexic, a font designed specifically for people with dyslexia.
- Stylebot: this extension allows us to modify the styles of a web page to adapt them to our needs (more contrasting colors, maximum text width, etc.)