

# Digital Accessibility Best Practices Guide

UK-Brazil Digital Access Programme

nic.br

gov.br



UK Government





# Digital Accessibility Best Practices Guide

UK-Brazil Digital Access Programme

2023

# UK-Brazil Digital Access Programme (DAP)

## Digital Accessibility Best Practices Guide

This guide was produced within the framework of the cooperation agreement between the British Government, the Digital Government Secretariat of the Ministry of Management and Innovation in Public Services (SGD/MGI), the Ministry of Health, the Web Technologies Study Center (Ceweb) of NIC.br, and *Movimento Web para Todos* (Web for All Movement), in addition to the review and contributions of those listed below.

## In Partnership with

British Government

Digital Government Secretariat of the Ministry of Management and Innovation in Public Services (SGD/MGI)

Ministry of Health

## Coordination

Web Technologies Study Center (Ceweb) of NIC.br

## Manager

Vagner Diniz

## General Coordination

Reinaldo Ferraz

## Editorial Staff

Cláudia Martin Nascimento and Rodrigo Credidio based on content produced by the *Movimento Web para Todos*

## Illustrations

FreePik.com and the W3C Brazil Web Accessibility Primer

## Review and Contribution

*Movimento Web para Todos*

# Summary

- 4** Introduction to the Project
- 6** Accessibility Guidelines
- 10** Introduction to WCAG
- 12** Best Practices in Digital Accessibility
- 13** Project Management
- 22** Development
- 37** Design
- 47** Content
- 53** Conclusion
- 56** Appendixes

# 1. Introduction to the Project

This “Digital Accessibility Best Practices Guide” was created as part of the series “Digital Accessibility in Government Websites: Usability Barriers for Persons with Disabilities”, one of the initiatives of the cooperation agreement between the United Kingdom and Brazil through the Digital Access Programme (DAP). This Guide is funded by the British government in partnership with the Secretariat of Digital Government Secretariat of the Ministry of Management and Innovation in Public Services (SGD/MGI) and the Ministry of Health, and coordinated by the Web Technologies Study Center (Ceweb) of the Brazilian Network Information Center (NIC.br), with the support of the Ministry of Health (MS), the Ministry of Human Rights and Citizenship, the National School of Public Administration (Enap) and the *Movimento Web para Todos* (“Web for All Movement”). The content curation, organization, and execution of the activities part of this initiative – including the accessibility journey mentioned in this guide – were the responsibility of *Movimento Web para Todos*.

The Guide’s general objective is to provide the federal government with theoretical and practical input, documentation, and tools to support the implementation of strategies for accessible digital transformation, given the Government’s responsibility to ensure adequate treatment for persons with disabilities and implement public policies based on concepts of human rights and social vulnerabilities.

Product of the four workshops held with federal government employees, this best practices in digital accessibility Guide draws from, concepts, examples, doubts, recommendations, and indicated tools, among other topics of these shared discussions. This material is important to keep “alive” the knowledge about accessibility on the Web – both for recurring consultations by those who already have a technical background and for those who wish to be introduced to the topic.

This Guide is free and open and can be shared freely as long as a reference is made to the authors. By doing so, this initiative can continue to share knowledge with society.

## Why does accessibility matter?

According to the Brazilian Institute of Geography and Statistics (IBGE), more than 45 million people have a disability in Brazil. This part of the population may have difficulty interacting and understanding the content of web applications or be unable to complete registrations, issuing online payments or using applications that do not have buttons with appropriate labels.

Accessible, websites, apps, videos, stories, podcasts, and any other content and digital environments should be made available to all people, especially those who have a form of disability. This includes those with visual impairments who can only communicate in Brazilian Sign Language (Libras), or those with hearing impairments, reduced mobility, or those with neurodiversity. Digital accessibility also benefits older adults and people with low literacy, providing more comfort and security for people in general.

A safe path to making the Web more accessible is to follow the Web Content Accessibility Guidelines (WCAG) of the World Wide Web Consortium (W3C), which deals with accessibility on three major fronts: design, content, and development. WCAG is based on the “device-agnostic” concept, which means that, in general, the recommendations refer to any devices. For example, if there is a contrast ratio, it will be valid on both computers and mobile phones. Depending on the size of a touch area, it will be better accessed on a browser and mobile application.

However, beyond being familiar with the WCAG recommendations, it is necessary to promote a accessibility culture within organizations, in order to give a meaning to this knowledge, and understand the impact of this agenda on people’s lives.

We all bear a part of this responsibility and can participate in this inclusive process. When we are aware of the digital barrier, we can report it to technical and development teams, even if we do not know how to solve it.

## 2. Accessibility Guidelines

Lack of accessibility, in both the physical and digital world, mainly impacts people with permanent or temporary disabilities and people who depend on accessibility for any other conditions. This Guide prioritizes those with different disabilities.

There are at least 1.3 billion people in the world with some form of disability. According to the 2010 Census, about 45.6 million people in Brazil are disabled (12.8 million) or have a functional limitation (32.8 million)<sup>1</sup>. In 2018, IBGE released a technical note, proposing another way to analyze the responses to the 2010 Census and, therefore, to establish the criterion to consider someone a “person with disabilities”. By reclassifying the data, the total contingent of people with disabilities reduced to 12.7 million, or 6.7% of the population<sup>2</sup>. The most recent figure at the time of this publication came from the National Survey of Health (PNS) 2019, which showed that there were 17.3 million people with disabilities in the country<sup>3</sup>.

Regardless of the number used, the important thing is to emphasize that these people also want to make purchases, be informed, relate with others, have fun, work, and study, but often cannot do so or have many difficulties due to accessibility issues.

When we observe a sidewalk, we can easily see if it was planned considering accessibility, for example, whether tactile paving was used. However, more is needed. When creating this paving, it is necessary to consider who will use it. It is common to see tactile paving on sidewalks that

---

1 IBGE, 2010 Census.

2 IBGE, Technical Note 01/2018.

3 IBGE, PNAD 2022. <https://agenciadenoticias.ibge.gov.br/agencia-sala-de-imprensa/2013-agencia-de-noticias/releases/31445-pns-2019-pais-tem-17-3-milhoes-de-pessoas-com-algum-tipo-de-deficiencia> (in portuguese).



end at a wall or pole, or even those with so much unevenness that a person with visual impairments cannot balance themselves, or worse, they could suffer serious injuries. This is because whoever creating this sidewalk lacked adequate knowledge about accessibility and its impact on those who it is intended to benefit. When designing a project, this knowledge is necessary from the very beginning.

These situations we experience in the real world can be transferred to the digital world. When we walk in the streets, these situations are more evident, but when we surf the Web, whether on a website, a distance learning portal, or the platform of a financial institution, it is more difficult to perceive the barriers to significant access.

The digital world of the Web was created more than 30 years ago, intending to be a more accessible environment for everyone. Despite this, it is still not very accessible. This is mainly because the teams involved in projects do not combine technical knowledge with empathy and understanding of the reality of who will use this space. When we don't consider accessibility, we take away people's autonomy. Imagine a button with no description in an online shopping app, visually impaired individuals would simply not be able to complete purchases.

Digital accessibility is a human right. In 1948, the Universal Declaration of Human Rights was published by the United Nations, and it was essential to establish basic rights principles. In 2006, the Convention on the Rights of Persons with Disabilities was constituted and, in 2009, this document was ratified by the government of Brazil as a constitutional amendment. In 2015, the Brazilian Law for the Inclusion of Persons with Disabilities (LBI), no. 13.146, was passed, dedicating a specific article (Article 63) requiring accessibility on websites.

## Who are the people with disabilities that are benefited, and how do they navigate the Web?

There are three kinds of disabilities:

- Congenital or hereditary (when a person is born with a disability)
- Acquired (when a person develops the disability over the course of their lifetime)
- Temporary (when the person has a disability, but on a temporary basis)

The most common groups of disability types, according to the 2010 IBGE census, are:

- **Persons with visual impairments** (blindness, low vision, color blindness, or color vision deficiency). There are about 35 million people with some visual impairment, of which 6.5 million have great difficulty seeing or cannot see at all. They navigate with assistive technology resources such as screen readers, screen magnifiers, and electronic magnifiers, among other resources.
- **Persons with physical disabilities** (weakness, tremors, involuntary movements, paralysis, sensory limitations, pain that prevents movement, absence of limbs). There are about 13 million people who have physical disabilities at various levels. Many of them are unable to use a mouse. Then, even with their hands, they use the keyboard to navigate. Many use gaze-driven navigation with special technologies or special joysticks and voice features, among others.
- **Persons with hearing impairments** (deafness, low hearing, deaf-blindness). There are 9.7 million persons with hearing impairments, deafness, or severe low hearing. Depending on the type and degree of disability, these people may need captioning and interpretation resources in sign language, which would be Libras (Brazilian Sign Language) in Brazil.

- **People with speech disabilities** (difficulty speaking, insufficient volume, stuttering, muteness). The 2010 Census did not monitor this condition. Therefore, there is no data on this group.
- **Neurodiverse persons** (difficulties of varying degrees to see, hear, speak, understand, and interact socially). Neurodiversity covers two groups: intellectual disabilities and psychosocial disabilities. The 2010 Census called this group “mental/intellectual disability”, but it is important to point out that they are two groups with different characteristics. In any case, based on the IBGE survey, there are about 2.6 million neurodiverse people. This group includes people with various syndromes, such as Down syndrome, persons on the autism spectrum, those with dyslexia, and those with ADHD, among others. They benefit from more intelligible, objective, and distraction-free content and access to content in different formats simultaneously. They use features of the keyboard itself, gaze-driven navigation with special technologies, special joysticks with larger buttons, and color games, among other features.
- **Persons with multiple disabilities** (combination of two or more disabilities). The 2010 Census did not monitor this condition. Therefore, there is no data on this population.
- **Limitations due to aging** (of a person who may be categorized as belonging to one or more disability groups). The 2010 Census did not monitor this condition. Therefore, there is no data on this population.

In addition to these categories, despite being little mentioned or known, anxiety has become a recent issue that affects Web browsing and is linked to frustration. An example is when the time to accomplish a task is too short -such as having 30 seconds to enter a validation code or activate a promotion code on an e-commerce website. Not having enough time is also a challenge faced by persons with visual impairments and reduced mobility.

## 3. Introduction to WCAG

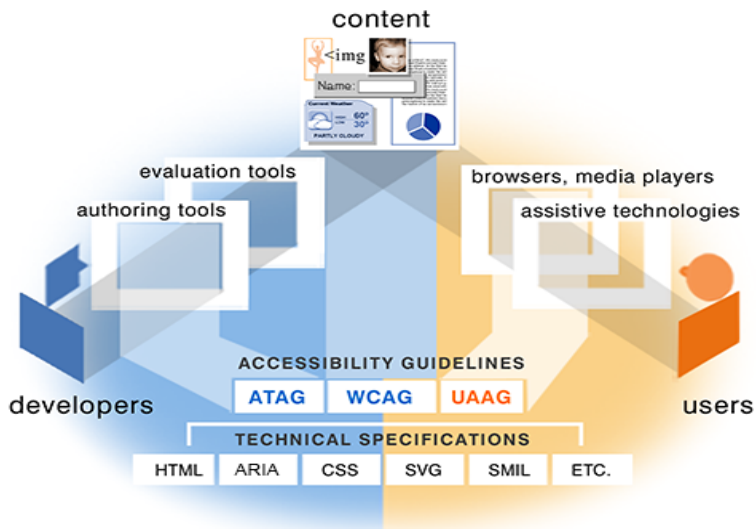
**T**he Web Content Accessibility Guidelines (WCAG) are a set of accessibility recommendations published by the World Wide Web Consortium (W3C), an organization founded by Tim Berners-Lee that publishes development standards and guidelines for building the Web. The WCAG document with the official standards is currently at version 2.1, with 78 recommendations, but version 2.2 is already being released.

WCAG is organized around four accessibility principles (perceivable, operable, understandable, and robust) and contains success criteria classified into three levels of compliance (A, AA, and AAA). By meeting Level A of these accessibility criteria, a Web page will be adapted to the most basic level of digital accessibility. Level AA is intermediate and is recommended by competent bodies, both nationally and internationally, as the minimum level to be achieved. The AAA compliance level is the desired one, the one that will be able to make Web content more accessible to the greatest number of people.

The W3C works with the concept of a single Web in which all content must be properly structured and delivered for users to choose the best way to navigate, i.e., using mobile phones, tablets, a Libras window, or screen reader software. For accessibility to be a reality, both pages and content must be prepared and compliant with these standards.

When working with content standards, we must remember that browsers and applications also follow guidelines for rendering and transmitting that content to users. Screen readers and other assistive technology features also follow guidelines for understanding the content presented. If accessibility is not applied, applications that follow these guidelines will create barriers for those with disabilities.

Developers make use of WCAG to create accessible content. Following accessibility best practices ensures that browsers and assistive technology users understand the content of applications without access barriers. The illustration below shows a complete, organized, and well-structured ecosystem to generate content with logic and equity, with technologies for developers and users based on the accessibility guidelines and technical specifications of the W3C to ensure interoperability between different actors and technologies.



Source: WAI, W3C

For example, WCAG recommends using semantic and native HTML elements, such as form elements, hyperlinks, buttons, etc., that are accessed, by default, from the keyboard. If non-native elements are used instead, assistive technology features may not recognize their functionality.

The content of this guide within the scope of the project strictly follows the WCAG guidelines. Following the guidelines of this document contemplates what the LBI defines as “international best practices in accessibility.” To learn more, visit: <https://www.w3c.br/traducoes/wcag/wcag21-pt-BR/> (in portuguese).

## 4. Best Practices in Digital Accessibility

In 1948, the Universal Declaration of Human Rights was published. It was an essential post-war document to reestablish basic rights principles based on equality and non-discrimination. Accessibility is, therefore, a human right. Its absence, also in the digital environment, is a violation of these rights and the entire arsenal of laws enacted in the following years - such as the Convention on the Rights of Persons with Disabilities and the LBI. The laws, regulations, norms, and policies our society has produced over the past decades have increasingly highlighted the essential nature of accessibility in the lives of persons with disabilities.

Interactions between persons with and without disabilities are one of the most effective ways of demonstrating the power and functionality of accessibility in social interactions. This exchange of experiences is important to make society more just and inclusive. Accessibility is not intangible. It is indeed possible to make it part of the DNA of companies.

It is important to emphasize that digital accessibility is focused not only on the development of applications and websites but also on content in general, such as videos, stories from social networks, posts, press releases, memos, etc.

To demystify what digital accessibility is and provide information for a better understanding of how we can build a Web with more equity, we will present practical tips on how to put this into practice, by showcase four different and complementary perspectives: project management, Web development, design, and content generation.

## 5. Project Management



Source: [W3C Brazil Web Accessibility Primer](#)

**D**igital accessibility directly impacts the physical environment. Shopping in a grocery store, issuing a document, ordering food delivery at home requires accessibility so that as many people as possible can be assisted. During the COVID-19 pandemic, digital accessibility proved essential for basic survival and subsistence activities since people were forced to stay inside their homes, had very limited mobility, or were restricted to other physical locations. Digital accessibility allows persons with disabilities to have the autonomy to do everything they want and need in their daily lives. Hence the importance of managing projects with accessibility in mind.

According to the Project Management Institute (PMI), one of the largest international associations in the field, the life cycle of project management is generally com-

posed of five phases: initiating, planning, executing, monitoring/controlling, and closing<sup>4</sup>.

Let us understand how accessibility can and should be addressed in each of these steps.

## Initiating

For digital accessibility to positively impact the lives of millions of people, it must be thought of from the beginning and embedded in the design of projects, which is the initiation phase in the management of accessibility projects. It is like building a house that already provides accessibility instead of redoing the construction work once it is completed. The sooner we consider accessibility, the better. Posterior remodeling can cause more harm than good. It is a serious flaw to think about making an application first and worrying about accessibility only at the end.

For this reason, in the initiation phase, it is of vital importance to consider the concept of universal design, which is “the design of products, environments, programs, and services to be used by all people, without the need for adaptation or specific design, including assistive technology resources”<sup>5</sup>. An excellent example of applying the concept of universal design in the digital world is to think about the use of mobile phones, not only by people who are blind, colorblind, or have low vision, but also by persons without visual impairments who use mobile devices in the sunlight, which decreases the visibility and contrast of the screen content, or who need to access audiobooks while driving.

At this initial stage, it is essential to work on the culture of accessibility within organizations and rely on the direct participation of persons with disabilities in the teams that will be formed and involved in the projects. In this way, the theme of accessibility gains more engagement from

---

4 Source: Echos School of Design Thinking. <https://escoladesignthinking.echos.cc/blog/2019/11/fases-de-um-projeto/#:~:text=Segundo%20o%20PMBOK%20%E2%94%80%20Guia,monitoramento%20e%20controle%20e%20encerramento> (in portuguese).

5 LBI (Law 13.146/2015), Article 3.



enterprises as a whole. Several areas of enterprises must participate in the process of accessibility culture, even if it only knows the basic fundamentals: purchasing, human resources, development, homologation, marketing, etc. The idea is to involve as many departments as possible to help establish an accessibility culture.



Source: [W3C Brazil Web Accessibility Primer](#)

The first step is to identify a need, a problem, or a business opportunity, as well as some *personas* (the profiles of users). Next, gather more people, preferably from different areas of the enterprise, and conduct a brainstorming session, generating hypotheses and scenarios. During this phase, define the *personas* and the objectives. It is important to consider the *personas*, considering the part of the population with low digital literacy, those with low-performance cell phones, those who are semi-literate, and those who use some assistive technology, i.e., people with more difficulties. The more heterogeneous the *personas*, the richer the next planning stage will be.

During the initiation phase, it is necessary to ensure that the project team is aware of the issue of digital accessibility, the rights of persons with disabilities, and the market potential of this audience. Using motivating questions is an excellent way to get started and involve departments in the co-creative process.

Below are examples of motivating questions:

- How much does accessibility cost?
- How much more time will the project need to implement accessibility?
- How many persons with disabilities will use my app or access my website?
- Do blind persons shop online?
- Do deaf persons play musical instruments?
- Do quadriplegic persons use smartphones?

After thinking about motivation and guiding questions, it is essential to have an internal discussion about the challenges that lie ahead. Some examples are:

- Lack of knowledge and training on web accessibility;
- Lack of initiative to approach the topic in the enterprise (denial of accessibility);
- Lack of empathy by believing that people with disabilities do not use the Internet;
- Lack of communication to raise employee awareness;
- Little investment in skills and tools;
- Lack of prioritization to include accessibility in the enterprise's routine.

Keep in mind that the initiation phase must be very well founded for an idea to become a project and then a reality. Therefore, another issue that must be considered is what motivates an enterprise to work with accessibility. Try to evaluate what benefits would be good arguments for the project to move forward. Some good reasons to adopt accessibility as a strategic focus of enterprises are:

- Social responsibility: ensuring equal opportunities and rights;
- Improving the enterprise's image: strengthening the brand as a differential;
- Increased visibility by search engines: better-coded sites with better performance are located more easily by search engines. Images with alt text, for example, are better indexed by Google's algorithm;

- Loyalty of users and customers;
- Growth in website traffic;
- Competitive advantage: greater potential for audiences to visit and consume enterprise products or services;
- Open communication channel with users and customers so that they can report new access barriers and comment on the difficulties they encounter;
- Lower maintenance costs: well-crafted semantic content minimizes costs;
- Improved performance: Increases the application's accessibility and interoperability.

To introduce the idea of accessibility internally, show internal data to the enterprise. Show the number of people with disabilities in the enterprise and that a certain percentage encounter barriers to access, filming these people using the Internet, observing access barriers, and recording testimonials and reports about their experiences.

Finally, gather all this information and present it to the board. Relate the information to the reasons and benefits of working with accessibility listed above.

By the end of this first stage of accessibility project management, you should have answers to the following key issues:

- Defining at least one real problem and being clear about how your project intends to solve this problem;
- Delimiting the scope and breadth of the project;
- Identifying preliminary and final deliveries;
- Mapping the people and areas affected by the project (stakeholders) and what the main expectations are;
- Formalizing the above points in a document that can be presented to and approved by the competent areas. In addition, this material can be consulted by staff and other people in the enterprise.

## Planning

After the project is approved internally, based on the documents from the previous phase, we move on to the planning phase, where all the refinements and details must be thought out, including learning more about persons with disabilities and their realities for Internet access and use.

As we have already mentioned, it is crucial to consider accessibility throughout the entire project. The whole process can be undermined if a detail or part of the project does not work. For example, a purchase may not be made if a credit card data entry field does not work. Therefore, planning is essential!

So where to start? The first step is to delve into the universe of persons with disabilities and go beyond the guidelines related to digital accessibility. It is essential to learn about the different types of disability, as explained at the beginning of this guide, and their specific needs when using the Internet.

In addition to learning more about disabilities, it is important to familiarize yourself with how these persons navigate digital environments. Working with accessibility project management means thinking about the entire journey of persons with disabilities. And every step of the process is essential.



Source: Freepik.com

At this stage, two concepts become important to the recipe for success: predictability and autonomy. It is essential to foresee and elaborate the architecture for all

audiences with disabilities, aiming at an autonomous life with safety and well-being.

At the end of the planning stage, you should have the following:

- Project plan: with well-delineated activities, time-lines, and assignments of responsibilities;
- Definition of resources: creating the team that will be part of the functional project, with internal and external professionals, in addition to the availability of necessary courses and tools (software, hardware, etc.) to execute the tasks;
- Launch and follow-up meetings: to officially start the project and monitor its evolution. These periodic meetings are also important to promote integration among team members.

## Executing

Suppose the team of developers and designers is present from the start of the project, at the initiation stage. In that case, execution will surely flow much more smoothly compared to a situation in which there was no interaction and participation by these professionals. There is no point in having a planning team that is sharp on accessibility and an execution team that is completely oblivious and removed from the topic. And there is no point in having a development team that follows WCAG guidelines, without the commitment of the marketing team responsible for creating content updates aligned with accessibility concepts, for example. All the gears of the machine need to be mesh.

The execution phase is when what was learned is put into practice; when plans become reality. During this phase, you need to keep tasks up to date, closely monitor and guide teams, manage deadlines and schedules, and ensure that work is being carried out according to the original plan.

Development is the heart of the project, complemented by design and content. Certainly, at this point in the accessibility journey, it is mandatory to make sure that the team

is well-connected and aware of two fundamental points of digital accessibility:

**1. Familiarity with accessibility documentation**

**(WCAG):** minimal understanding of what the WCAG guidelines require to make Web content accessible and knowing its structure. It is recommended that applications and sites meet at least the A and AA levels.

**2. Knowing the barriers to access for persons with disabilities:**

some checklists can be used to validate this point. The most common barriers are:

- Images without alternative text that prevent blind people from understanding published photos;
- Videos without subtitles, which make it difficult for oral deaf persons to understand;
- Pages with a lot of movement, which can disrupt the concentration of neurodivergent people (random carousels, banners, pop-ups, etc.);
- Applications that rely on mouse use can make navigation difficult for people with motor disabilities.



Source: Freepik.com

Attention! In execution, there is no magic bullet. It is very common to believe in the promise that the mere installation of plugins will bring accessibility solutions with a simple push of a button. Don't rely on miraculous accessibility tools. Remember that accessibility can be invisible. Often, it is in well-written code that respects accessibility standards and recommendations, rather than in a visible and "miraculous" plugin.

Finally, always remember that accessibility is alive. Therefore, it is essential to pay attention at all times during execution to identify any needs for route corrections.

## Monitoring and controlling

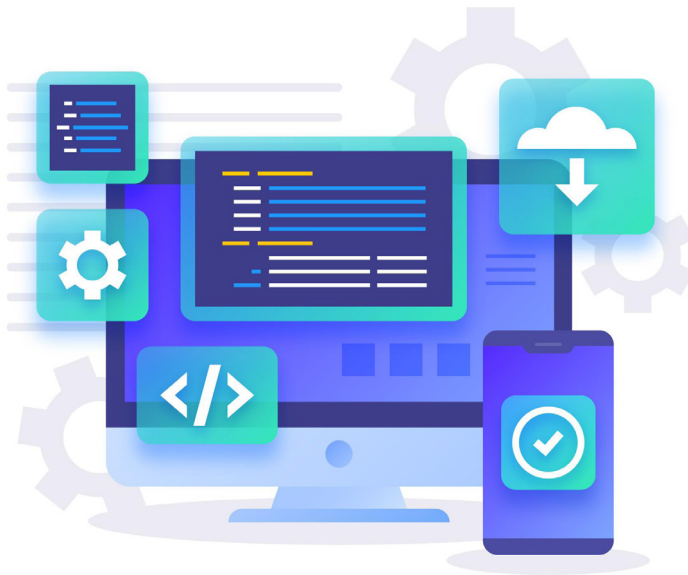
This phase consists of evaluating what is being produced and making the appropriate "route corrections". Checklists, as well as HTML semantics and accessibility validation tools, are very useful in this step. It is important to monitor the adoption of accessibility in projects and track budgets, team interactions, and schedules.

## Closing

After the project has been executed, the next and final phase is when the final project deliveries are carried out and the results measured. In closing, it is important to evaluate what worked and also what did not work well, for the learning of those involved and to improve accessibility culture.

## 6. Development

**F**ollowing WCAG guidelines is essential, but not sufficient. The more the development team delves into the world of persons with disabilities, tests, and prototypes and listens to user feedback, the more accessible and rich the process will be. At this stage, it is essential to ensure that the development team knows how to implement accessibility, verify it, and use the tools available in the market for testing and standardization. It is also important to ensure staff knows how people with disabilities use websites and apps.



Source: Frepik.com

Accessibility is a constant process. At the development stage, it is imperative to consider the following:

### Digital illiteracy

It is worth remembering again that users present different levels of digital literacy and Internet usability, which applies not only to persons with disabilities, but also in



general. For example, older people are increasingly present in the Web universe. We must consider that individualities, levels, and contexts are different, but that the principle of understanding must consider all cases.

## Checklists

An excellent practice that greatly helps the development of websites and applications. Have checklists for each area of the company, according to its role in the assembly line for accessibility. List key points of each stage and direct the teams involved to check them individually to take appropriate action before advancing to the next stage. A good checklist example can be found on the A11Y Project website (<https://www.a11yproject.com/checklist/>).

## Test group

Have a test group to evaluate your enterprise's projects. Ideally, this group should consist of persons with disabilities from the enterprise. Talk to the diversity department in HR and ask for help. This audience is usually delighted to participate and help test developments. Another alternative is to include a question on the website forms to learn whether users have disabilities and what they are. Another option is to hire a consultant to form a test group.

## Manual and automatic testing

There are two types of tests: automatic and manual. Automatic tests are performed by software and can scan for more generalist and limited elements than human perception. Manual tests are carried out to identify what automatic tools cannot verify, so they rely on human evaluation. The advantage of automatic validators is that they streamline the process and guide the development team to find which areas need attention or correction faster. However, there are several errors that automatic tests do not detect, i.e., manual testing is mandatory and usually done by experts and people with varied characteristics and skills.

Below we present a suggestion for the steps to perform a manual check of Web accessibility projects and reduce the presence of barriers, making your site or application as universal as possible:

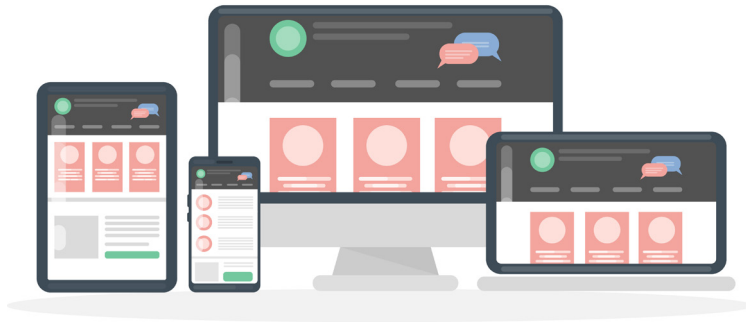
1. Make sure all buttons on the page are working via keyboard;
2. Use the browser's "inspect elements" feature to check for problems in code, for example, whether an interactive element is native;
3. Launch the screen reader and browse through the page. We suggest the NVDA reader, which is free and can be downloaded from the Internet;
4. Use available tools to perform a general assessment of the page, especially regarding points that are not detectable by the screen reader, such as minimum contrast (See the list of tools in the section "Automatic Validation Tools");
5. After using the tools, it is important to generate a barrier report - it can be a table or spreadsheet listing the problems encountered. Several columns with more information can be created, such as Recommendation, Compliance Criterion, Result or Status (fail or pass), Quantity, Principle, and the link to the success criterion text within WCAG.

## Mobile X computer browsing

A simple but effective test that should be done is to browse mobile phones (or smartphones). In Brazil, the population already has more mobile phones than computers. It is common for a person to browse using laptops or computers and not find any barriers. But when doing the same from mobile phones, some obstacles may appear, which should be avoided. Depending on the phone manufacturer and/or browser used, the accessible browsing experience can vary greatly. Everything on the screen has to be the same as what the screen readers users hear. It is important to remember that there are differences in browsing with

screen readers on mobile phones and computers. In the case of mobile, various combinations and types of screen touches are used. Depending on the platform, each reader has different navigation gestures and verbalizations, but they are small differences. When the website is well programmed, there are changes in behavior and verbalization, but the result of the journey is the same.

With these highlights, when programming, pay special attention to the main aspects described below:



Source: Freepik.com

## Semantics

The most important thing in development comes down to two words: “HTML semantics”. The biggest secret lies in writing good semantic code. This semantics of HTML consists of the use of the appropriate elements to reinforce its meaning, such as header elements for the title of areas of the page and descriptive attributes for images, for example. Adopting this practice as the basic premise of any and all development makes the testing phase much easier. Semantic code is essential and avoids many access barriers, such as touch navigation on mobile devices. Typically, touch navigation looks for native HTML interactive elements (anchors, buttons, links, etc.), but often, developers don’t use these native elements - they use other neutral elements and make them function like buttons or links. However, in the mobile version of touch navigation, the screen

reader cannot recognize that these components are buttons. By using them natively, we ensure access to these components.



Source: Freepik.com

## Labels and descriptions of buttons and links

Testing with screen readers makes it easier to detect elements that need adjustments to the semantic function. For example, the feature that triggers high contrast should be marked as a “Button” and not a “Link” because it performs an action. A person using a screen reader must understand what they are hearing. Therefore, using the correct semantics and being objective in the labels is important without being too complex or verbose. This will help navigation with different levels of mastery of assistive technology, making it easier and more fluid.

Another example is the description of links, indicating their purpose in an objective and explanatory way. Therefore, avoid links with texts such as “Learn More”, “Click Here”, or “Download Now”. Look for descriptions that can be read by users, especially those with visual impairments,

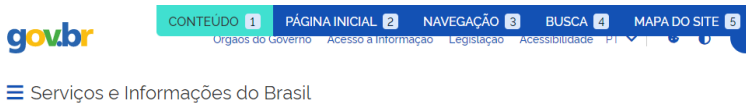
and that are easily understood. Examples are “Learn more about your vaccination certificate” or “Download the 2022 indicators report now”.



Source: Freepik.com

## Navigation shortcuts

Keyboard shortcuts are very welcome and can be used by people who are blind or have low vision or reduced mobility. Shortcuts can be visible but can also appear when the user uses the first TAB command. Shortcuts can be defined with the user experience team, but WCAG recommends that the first interactive item on the page be a link to the main content.



Source: [Portal gov.br](https://portal.gov.br)

## Text in images

One of the problems that often occurs is the use of text within images. Many developers choose to include text because it is a faster process that saves time. However, this practice creates serious barriers. It is necessary to use the text in HTML and CSS format so that when increasing the size of the screens, the content is not distorted. In addition to this barrier, screen readers do not read text rendered as an image.

## Alternative text of images

Every image that conveys relevant information should have text describing it in the “alt” field. When the “alt” is null, the screen reader can eventually recognize the image

and read “image” or the file name of the saved image. Decorative images, such as borders or backgrounds, do not require alt text. In these cases, taking the decorative image to the CSS is recommended.

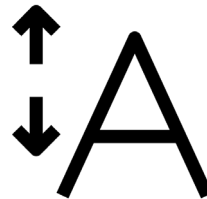
```

```

When a link contains only one image or icon, the description of the image must contain information on the functionality or destination of the link described in the “Alt” field. For example, in social network icons, users must be informed about which social network they will be taken to when clicking on the link.

## Text resizing

There is another situation in which manual tests are essential: when the browser resizes the text on the page, zooming in up to 200%. Manual tests help identify potential barriers by checking whether texts disappear, overlap, or are all visible and readable when zoomed in.



Source: Freepic.com

## Height

Another point of attention is the height of fonts, which should not be fixed. The minimum height (min height) must be 160 pixels. Automatic tools only check if there is any code blocking the augmentation of fonts. It is, therefore, necessary to look in the code to see if there are any fixed heights.



Source: Freepic.com

## High contrast and font size

As long as they are well designed, the high contrast and font size adjustment buttons can help users, but they are not a must since many persons with disabilities have these features installed in the browser itself or use keyboard shortcuts.

## Search field

Including a search field in applications is recommended. This makes finding and accessing information on the pages easier, especially for those with disabilities.



Source: [Freepik.com](https://www.freepik.com)

## Accessibility and frequently asked questions page

Any additional support for those who browse is welcome, not least because we know that people have several different profiles with greater or lesser dexterity in the digital environment. Therefore, creating specific areas to answer questions and provide accessibility tips are important. These contents must be easily located in the menu, visually and also by a screen reader.



Source: [Portal.gov.br](https://portal.gov.br)

## 100% keyboard navigation

All features of a Web page must be available via keyboard. Therefore, it is important to be careful with visual effects that require mouseovers to trigger information. Using the click alone or with the mouseover is recommended so that screen readers can detect it through focus. It is very common to use submenus that open using the mouseover effect to open links. In these cases, it is also necessary to have the option of the person being able to open or close these submenus using the keyboard.



Source: [Freepik.com](https://www.freepik.com)

## Visible focus

Another important point is making the focus visible, which can be a border or frame around the element where the user finds themselves in that environment. When the focus disappears or does not exist, navigating using only the keyboard becomes challenging.

In CSS we can use pseudo-classes to make the focus visible:

```
.hover, .focus {border: 2px solid blue;}
```



## Focus order

What is on a screen is not necessarily the same as what you hear with assistive technology features. For the screen reader, the reading order is different from the reading of a sighted person, because the software reads from top to bottom, and from left to right. It is imperative to consider navigation so that it is understandable and comfortable for all people.

For those who navigate using the keyboard and a screen reader, it is important to have a logical order when focusing on the elements. For example, users might be directed to the end of the page after a click when they were in the middle of the page's content, generating inconvenience and a bad browsing experience.



Source: [Ceweb.br](http://Ceweb.br)

## Forms

In addition to proper HTML semantics for each field, pay attention to error messages when forms are not filled out or are filled out incorrectly. These alert messages should be visible and understandable, with contrasting colors, and the correction suggestion should appear next to the field in question. Remember that forms should be as short as

possible, and fields should be easy to fill out. It is important to foresee some scenarios, including descriptive filling instructions, elaborate error messages, and help texts for more complex actions. In addition, adding fill and/or submit review, correction, or rollback functions is recommended.

NOME\*:

E-MAIL\*:

ASSUNTO\*:

SUA MENSAGEM\*:

**ENVIAR**

Source: [Movimento Web para Todos](#)

## Modals

Pay extra attention to modals (elements that overlap content without opening a new page or tab), and if possible, do not use them, because they offer many barriers to persons with disabilities. Adopt an alternative to modals, such as non-modal dialog (inlines), expansion elements (accordions), or even creating a new page. But if they must be used, follow these tips to make them accessible:

- They should be easy to close using a well-labeled and visible button;
- They must allow the use of the escape (ESC) key;

- Limit interaction to a simple task;
- Be brief and concise in your content;
- Check access with screen readers.

And what should you not do at all?

- Open a modal from inside another modal;
- Use full screen modals;
- Use multi-step modals (example: in a form);
- Open a modal automatically, unless requested by the user;
- Use marketing modals because it bothers many people.

## Error identification and suggestions

When a form fill error message appears, for example, this message should be close to the field and easily readable by the screen reader. It is common for these warnings to appear far from the problem fields, making them difficult for screen readers to detect.

NOME\*:

O campo é obrigatório.

E-MAIL\*:

O campo é obrigatório.

Source: [Movimento Web para Todos](#)

## Headers

Another common mistake is using header features such as font size formatting, assigning an improper semantic function. The size of the text does not define the content hierarchy of a page, but by its logic. Every page should contain a Level 1, or H1, title that describes the page. Each section should contain a Level 2, or H2, heading that describes the section. And so on, following the same logic.

```

<H1>News</H1>
  <H2>Cities</H2>
    <H3>São Paulo</H3>
    <H3>Rio de Janeiro</H3>
  <H2>Sports</H2>
    <H3>Basketball</H3>
    <H3>Football</H3>
      <H4>World Cup</H4>
        <H5>Brazilian national team</H5>

```



Source: [Ceweb.br Collection](#)

In the case of tables, insert headers to explain the data and make it visible or available only to the screen reader. It is recommended that they be visible.

## Breadcrumbs

People should be informed about their current location within a set of related pages.

[🏠](#) > [Serviços](#) > [Consultar restituição de imposto de renda](#)

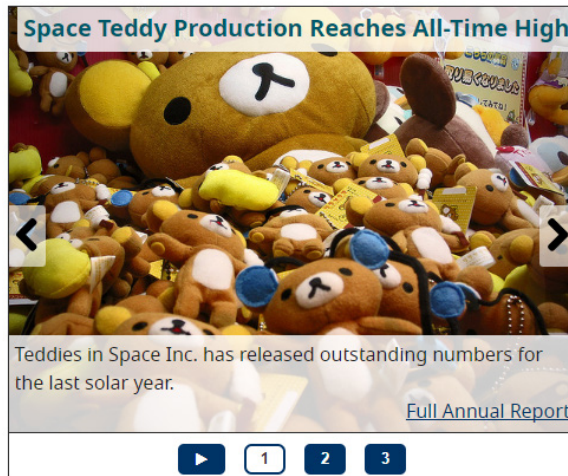
Source: [Portal govbr](#)

## Pausing, stopping, or hiding content

For moving content such as carousels, it is important to allow the user to pause, hide or stop it. Content without

movement and speed control impairs the experience of persons with neurodiverse disabilities and/or those who use a screen reader, since they can generate cognitive overload, distract those who browse from the rest of the content, and make it difficult to navigate through it.

Therefore, avoid including automatic movements. If they must be maintained, provide the option to pause and/or reduce motion in addition to forward and rewind buttons. In short, moving elements such as banners and carousels must contain pausing of movement, navigation and control using the keyboard, and communication of the transitions between the content to assistive technology resources.



Source: [WAI](#)

## Click areas

Attention when setting the minimum touch area size of a clickable area! It should be 44px (pixels) high and 44px wide. Google recommends 48px by 48px. If the size used is less than 48, SEO performance will suffer.



Source: [W3C](#)

## Captchas

These are often real navigation barriers. The “I’m not a robot” option can be effective and accessible. Still, other options that come with audio or image challenges usually create barriers, be it because the audio is noisy, the images or figures are out of contrast, or the click area is too small. Captchas create barriers for several people, both those with disabilities and those without. There are other ways to verify whether the interaction is generated by a human that are easier to use, such as automatic detection and alternative forms of verification, such as easy-to-answer questions like “What is the capital of Brazil?” If the captcha is really necessary, make sure it is simple to understand and offers alternatives with persons with disabilities in mind.

With the guidelines that make up the programming or development step, it is worth remembering that every structure of a website or application needs to be very well thought out. It is essential that, during this phase, the work and development processes between managers and teams be as horizontal as possible to increase the level of collaboration within the team and increase adherence to accessibility. Additionally, familiarize yourself with and follow accessibility principles, guidelines, and recommendations so that as many people as possible can have the best experience using the app or website.

The more that most or all of the recommendations are followed, the better the applications’ accessibility. Full accessibility does not exist, but by respecting national and international standards, there is much less chance of causing impediments and barriers for people.

## 7. Design



Source: Freepik.com

**T**here is a notion that accessibility makes a website too simple or ugly. That is not true. A well-structured website can be beautiful and creative. It is even possible to create different visual presentations for the same HTML structure of a website with the use of CSS and meet different needs.

Creating accessible projects means creating projects for all people; therefore, the Accessibility Guidelines (WCAG) are based on the concept of universal design already mentioned in the project management section. One of the principles of this concept states that content should be accessed by all people without the need for adaptation. An excellent example of universal design in the physical world is a well-designed and accessible ramp, which can be used by many passersby, with and without disabilities. The digital world is no different. Today it is possible to

deliver a digital project in various forms to the user. Although the content is always the same, those who browse can access it in various ways, such as in text, in audio format from a screen reader, on a smaller device, or on a larger screen, without losing quality or functionality. It is also possible to customize the content to be available on a TV screen.

Many aspects of accessibility can already be thought of and defined at the beginning of the project. When accessibility is considered in products and services, it is important to account for persons with disabilities and other target audiences, such as older adults, already in the product discovery and design thinking phases. It is important to consider the user's journey and think about solutions that can facilitate their navigation.

## Wireframes

Many behaviors and elements can already be defined and planned at the wireframe design stage. For example, imagine that users need to increase the size of the fonts using the resources of their particular software, what will the breakage of their design look like? Or if you are using a feature that modifies the contrast of the page, will it be able to read the text with the background? What would happen if those who browsed used a translator to change the language of the texts and the words got larger? Is the size of the buttons big enough for people with motor difficulties?

All these actions can be considered at this stage.





Source: [W3C Brazil Web Accessibility Primer](#)

## Responsive design

Responsive design greatly impacts accessibility because it allows you to adjust the interface to suit the needs of those who browse. If users prefer to use the phone vertically or horizontally, or increase the font size, the interface adapts to it. One tip is to think about mobile-first design then expand the content to desktop computers, making development simpler and allowing better adaptation of the content on the screen.



Source: [Freepik.com](#)

## Use of color

Colors should be chosen carefully, because people see colors in different ways. Some cannot see the entire color spectrum, as in the various types of color blindness - some cannot see red, some cannot see blue, some cannot see green, and some cannot see any color. The colors used can have a huge impact on how these people perceive and understand the content.

An example that illustrates how colors can affect comprehension is when important information in a Brazilian football championship table is conveyed using only colors. While the teams that will proceed to relegation are marked in red, those classified for the Libertadores da América Championship are labeled in green. However, people with certain types of color blindness cannot notice much difference between these results, since these hues are too similar for them.

Using only colors to convey information also affects people with visual impairments. A blind person will not be able to determine whether their team has made it to the Championship when browsing this content. Along with colors, the information must be available in another format, with the use of symbols or with text (in this example, “classified and “downgraded”).



Source: Freepik.com

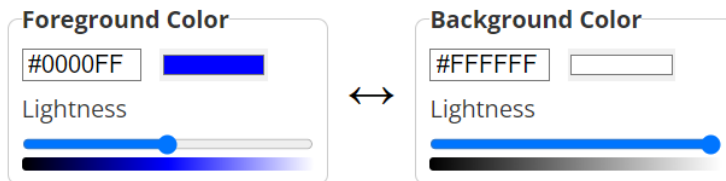
## Color contrast

Another important point is the choice of color contrasts, especially between background and foreground text. Information in images, graphics, and other visual elements should also have adequate contrast. People with low vision

and other visual impairments may have difficulty reading and understanding information. Take special care with gradients. If used, measure contrast in at least three different places: darker, lighter, and medium tone. Inappropriate contrasts can create barriers and interfere with the experience of those who navigate, who may not be able to perform a specific action.

Contrast is related to color but also to font size. The contrast should be higher if the font is too thin and small. It is possible to balance the increase in contrast with the font size. That is why it is always feasible to adapt, even if there are conflicts with the brand's color palette - when using a large font, for example, it is possible to use a few shades of yellow with a white background.

Some tools detect if the contrasts are adequate and if the font size conforms to the specific color.



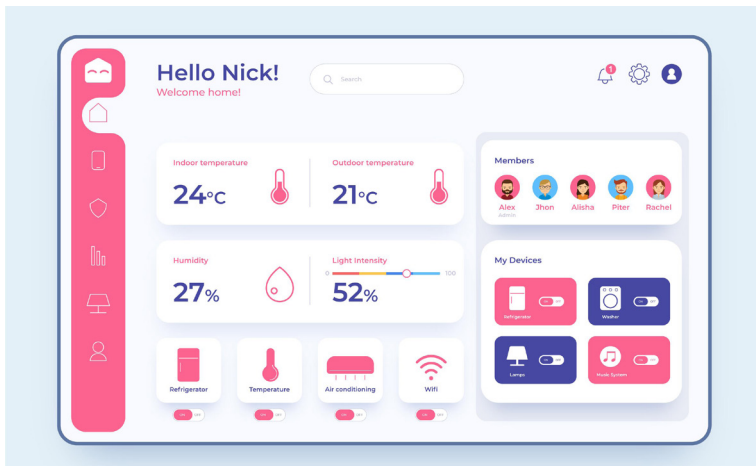
Source: [WebAim](#)

## User interfaces and experience

The interfaces must be organized and without excess information so the user can navigate the contents comfortably, find the information easily, and do what needs to be done. The interfaces should also be easy to interact with. Consider good spacing between the content to allow people with reduced mobility to handle it without unnecessary effort.

For example, a form with questions that are too close to each other can cause a person who navigates with their feet to have difficulty accessing the fields. The different

parts of a project must have standardized and consistent information for the best location of the elements on the pages, such as always placing a search field in the same place, facilitating search time, and being familiar to those who browse the website.



Source: Freepik.com

## Accessibility features

A high contrast option (dark mode) for the enterprise's web pages and larger fonts are recommended. Font size buttons are not specifically mandatory for accessibility, since people can use the browser's zoom feature. However, these buttons can provide extra ease and comfort for those who navigate. If the buttons are created, you must consider whether they have sufficient spacing and click area to be accessible by persons with reduced mobility. It is worth remembering that this feature is not mandatory to ensure accessibility, but it offers more user-friendly navigation.



Source: [Portal gov.br](https://portal.gov.br)

## Text blocks and paragraphs

Paragraphs should be reasonable sizes and sentences should not be too long, which can hinder reading with screen readers and Libras avatars. The average should be around 80 characters per line. Very thin widths, with less than 80 characters, are not a barrier, but they affect the reading of those who navigate with a screen reader, because they have to click more often on the keyboard to change lines when reading.

Avoid using long text blocks in upper or condensed cases. In text blocks, avoid justified alignment. Left alignment is always recommended.



## Hierarquia de cabeçalhos

Ao utilizar um leitor de tela para navegar, existem uma série de atalhos de teclado que podem para facilitar esse processo.



Existe a possibilidade de navegar entre cabeçalhos, de maneira hierárquica. Ou seja, se eu estou navegando entre **H1**, eu posso a qualquer momento querer varrer entre os cabeçalhos **H2** filhos daquele **H1** e depois nos **H3** filhos de um determinado **H2** (desde que o site esteja corretamente estruturado) e assim por diante.

Para isso acontecer, devemos definir de maneira correta esses cabeçalhos, pois além de serem extremamente relevantes para SEO ainda melhoram a navegabilidade por leitores de tela.

O **H1** normalmente é utilizado como cabeçalho principal, não se repetindo numa mesma página.

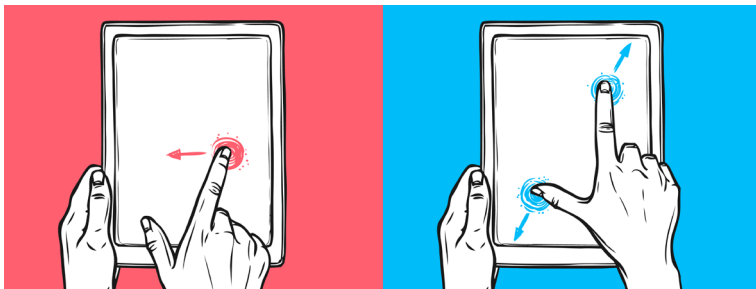
Source: [Movimento Web para Todos](https://movimentoweb.org.br)

## Fonts

Fonts should be fluid and easy to understand. Avoid using elaborate and handwritten fonts. The minimum recommended font size is 18 points or 14 bold points. Setting the font size smaller than the default size for browsers should be avoided. People with autism and low vision have difficulties with small print texts. Also, maintain a minimum spacing between the lines.

## Click areas

Click areas must be large enough for everyone to access them comfortably and safely. On a desktop computer, the minimum size should be 24px by 24px. On mobile devices, 48px by 48px. These dimensions are recommended even if the icon size is smaller. For example, one icon is 40px wide and another is 24px wide, but both have a minimum click area of 48px.



Source: Freepik.com

## Links and buttons

Links on the screen should contain continuous, uncut text, such as when ellipses are used (“...”). The recommendation is that the links have two visual characteristics - blue font and underlined text, for example. Remember that every interactive element should have clear keyboard focus.

Attention should be focused on the semantics of links and buttons, which should not be defined by appearance, but by functionality. It is customary to assign a link design to the button and vice versa. A link is not just underlined

text, it navigates between parts of a page or between pages. A button is not a text with a box, it performs an action.

## Content in different formats

It is important to provide content in a variety of formats. For example, people with low digital literacy benefit from video content and/or social media posts because they are already used to consuming these formats. Neurodiverse people have an easier time understanding information if they read a text and listen to an audio or video simultaneously.

## Be careful with animations

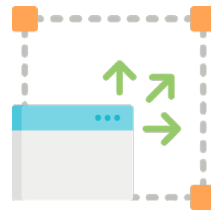
Animations should be used only when necessary. They should have content alternatives such as images and text, not contain excess information, and be fast loading. Speed can be a barrier, so it is also important that they work at a reduced speed. Avoid full-screen animations and parallax-like effects, which can be uncomfortable and distract many people. It is essential to leave the control of animations with those who browse, giving them the option to stop, pause, and resume movement. Avoid movements that blink more than three times per second, as they can cause epilepsy or seizure episodes.



Source: Freepik.com

## Screen magnification

If the screen is enlarged with the browser zoom up to 200%, the content cannot suffer loss or overlap of information.



Source: Freepik.com

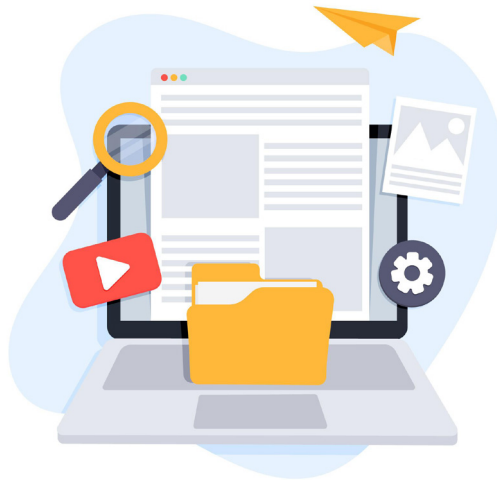
## CSS and the accessibility tree

Care must be taken with CSS styles of the *display: none* and *visibility: hidden* types, for they also hide the elements for assistive technology features. Creating buttons with text and icons is a good practice to help deaf persons locate content and neurodiverse people better understand its meaning. However, if buttons are provided only with icons, it is important to create an accessible name, which can be visually hidden, with a suitable CSS class. When the button action changes, the text should change according to the new status, for example, expanding and retracting.



## 8. Content

To produce accessible digital content, the first step is understanding that everything we communicate impacts people. Therefore, it is essential to start with how we approach our audience and create the culture and habit of digital accessibility in our teams. The first course of action is to focus our awareness on the right place and using the right terminology. It is very common to find in the media terms such as “the disabled”, “disabled people”, “people with special needs”, “special people”, and so on.



Source: Freepik.com

These terms are no longer used or accepted since the 2007 UN Convention on the Rights of Persons with Disabilities, because they refer to an outdated concept of disability as a synonym for illness, or as something that does not belong to the person, as if they could choose to “carry” it whenever they wanted. Nowadays, the use of the term “persons with disabilities” is recommended because it does not disguise the presence of a disability, a human condition that is related to biological, psychological, and social aspects, in addition to barriers imposed by society. Moreover, this term makes the person the protagonist

within their different abilities, challenges, and ways of perceiving the world.

## How to use this term

Always use “person with disability”, then specify using: visual, auditory, physical, intellectual, multiple, etc. One can also say deaf person, blind person, wheelchair user, quadriplegic, paraplegic, person of short stature, with low vision, autistic, dyslexic, neurodiverse, or neurodivergent person. When in doubt, ask the person what they prefer to be called.

## Basic tips

- What do we want to convey to people? The preference is to construct uncomplicated and objective text and avoid ambiguity or redundancy. Opt for more familiar words and avoid using figures of speech and phrases with a “sense of urgency.”
- The use of proper punctuation is important and can impact the understanding of the text through various assistive technology resources, such as screen readers.
- Be careful with colors. Certain combinations can cause people with some degree of color blindness to not understand the information.
- When creating a video or podcast script, avoid putting too much information in short periods of time. Pause the content more, leave enough spaces to include audio description, and make interpretation in Libras easier.
- Be careful with the use of animations so as not to cause inconvenience and distractions.
- Sound effects should be chosen with caution. Avoid sound output that is too loud, which can cause inconvenience to people who wear hearing aids and bother people with autism and other types of neurodiversity.

- Excessive visual effects can distract from the necessary information and impair the visibility of people with low vision.

## How to create more accessible content

### Text

Text should be left aligned. Avoid long sentences (ideally 15-20 words). Long text can be a barrier for people with dyslexia or low literacy. Short text helps people with ADHD and those who use screen readers.

### Direct order in phrases

The preference is to use direct order in phrases because it facilitates understanding and speeds up reading, avoiding misunderstandings. An autistic or dyslexic person may get lost in sentences written in indirect order.

### Image

Any images or non-textual content relevant to understanding information, such as photos, graphics, organization charts, illustrations, and images that replace buttons or links, must have alternative text. Merely decorative images should be ignored by assistive technology resources.

### How to describe the images

- Identify the type of image and characters (photo, illustration, map, graphic... and “what/who”)
- Locate (where)
- Describe the action (what is done, how it is done)
- Reference (when)

The simplified procedure is to explore the format, the main element, and the action, seeking to identify the most relevant elements. Mentioning colors is recommended. For people with color blindness, it can be important information. Avoid pleonasm, such as “the photo shows” or “the art exhibits”. Avoid adjectives and value judgments, such as beautiful people.

## **Text images**

Do not use text images. This text will not be translated if a foreign person translates the page using Google Translate. When users zoom in on the page, the text becomes distorted and loses readability. In addition, people who use specific plugins, for example, for dyslexia, cannot customize the text because it will be inside the image.

## **Complex images**

For graphics, comics, pictures, and other more complex images that require a longer description, this content alternative can go in a separate location. Including long descriptions in alt-text can disrupt the navigation of screen reader users.

## **Icons**

Adding icons to the content is recommended so that deaf persons who exclusively use sign language can recognize the content faster and better understand the information. Using icons plus text is a good practice. When there are icons that work as buttons, such as a magnifying glass that serves as a search button, the ideal is for these icons to receive an alternative text (alt-text). For example, “verify orders”: It is unnecessary to put “magnifying glass verify orders”. The icon is a visual support of the text but is not informative. The description should provide information about users’ actions and where they will be directed.

## **Animations**

They can be disturbing and cause epilepsy, headaches, and even nausea. Avoid them whenever possible and use them only if there is a purpose.

## **Video media**

Videos should have short descriptions, because they help people understand the content that will be presented. Videos should contain built-in subtitles for those who cannot hear the displayed content. In subtitles, prefer larger

font sizes and high-contrast (black) background. There are two main types of subtitles:

- **Open caption:** These are subtitles embedded in the video file. This feature can be used when it is not possible to provide subtitles when publishing content or sharing on social networks, such as on communication apps like WhatsApp and Telegram.
- **Closed caption:** You can enable or disable subtitles, such as for services like YouTube.

### **Audio description**

Another important video feature is the audio description, the art of turning images into words. It consists of interpreting visual content into audio and is usually produced for those with visual impairments, benefiting neurodiverse persons and other audiences. It is essential to think about the audio description in the script phase of the videos, providing reasonable and comfortable timing so that the video and accessibility resources are not superimposed on the locution in the middle of the locution.

### **Brazilian Sign Language**

Always provide an area for the Brazilian Sign Language (Libras) window to the right of the video. Check the contrast of the Libras window with the background of the video. Suppose the person's native language is Libras. In that case, they will benefit much more from the translation/interpretation in Libras than from the subtitles, even if they can hear something and understand Portuguese.

### **Audio and podcasts**

Including audio content can help many people. Sometimes audio information is a better option for understanding of dyslexic or older persons. Including a text transcription of the audio content is necessary. This transcription can be transformed into other formats, such as Libras, through an avatar and can also help neurodiverse people understand the content.

**On podcasts:**

- Transcribe the content of the episode, not just the spoken parts, but also other sounds (background sounds, sound effects, who is speaking, etc.);
- Insert an avatar on the page for the interpretation of the text transcribed in Libras;
- Also consider a video format for the file.

**Use of hashtags and emojis**

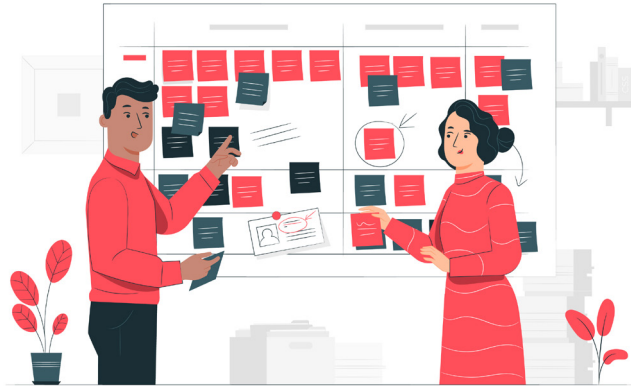
Native emojis and hashtags are accessible. For screen readers to correctly read words separately, capitalize the first letter of each word, like #AccessibilityMentorship instead of #accessibilitymentorship.

Do not abuse the use of emojis, because their description is not always enough to provide good understanding, and excessive use makes reading the content tiring.

**Hyperlinks should mark relevant content in the text**

Visually impaired persons navigate through the clickable areas of the page using the TAB. Therefore, the description of links and buttons should be sufficient to be understood separately, for example, use “download the list of documents required for the certificate” rather than “download pdf”.

## 9. Conclusion



Source: Freepik.com

One of the objectives of this journey was to work on the concept of accessibility, not as an absolute state, but as the elimination of access barriers through different aspects: design, development, and content. It is difficult to categorically state whether a website is accessible because, even if it receives an excellent evaluation using automatic validators, this does not mean that it is completely accessible to all people, since these indicators can often show false positives and false negatives.

At the same time, when comparing two websites, like one that has 250 errors while other has five errors, the accessibility experience will be very different in each, even though both have errors. Therefore, one must be careful when deciding whether a website is or is not accessible. What we recommend is talking about the elimination of access barriers. Consequently, we present these different aspects to identify the barriers more objectively and eliminate them.

To finish this guide, we present five reasons to be concerned and want to make websites and applications accessible:

## **Accessibility is the law: The Brazilian Law for the Inclusion of Persons with Disabilities (LBI)**

As stated at the beginning of this guide, Article 63 of the LBI makes it mandatory for organizations with headquarters or commercial representation in Brazil to have accessible web pages. This law overlaps with others, such as the Brazilian Consumer Defense Code and the General Data Protection Law (LGPD). The LGPD, for example, states that there must be clarity and transparency in information so that users know how their data is used. These and other issues impact accessibility without transparency, because, for example, a person might not access the information with a screen reader or because they did not understand the text.

### **Market and audience expansion**

Data from the 2010 Census indicated 45.6 million persons with disabilities and functional limitations in Brazil. This does not include other important audiences, such as older adults, people with low literacy levels, and digital immigrants. As people get older, they gradually lose visual acuity, hearing, and fine motor hand movements. When one of these people comes across a website that has considered accessibility since its first planning stages, they will have a much easier time navigating. In addition to gaining a larger market share, institutions with accessible communication channels welcome the entire population.

### **It is easier than it seems**

In addition to the W3C international guidelines (WCAG 2.1), which is a more technical document, there are several ways to absorb this content more easily. Several experts, enterprises, and institutions, in addition to the *Movimento Web para Todos*, publish content translating these guidelines in a simpler way to be better understood, providing tips, examples, and articles and listing the steps to achieve accessibility.



As a population, we share the responsibility of transforming digital environments into more inclusive and accessible spaces. Even if we use third-party platforms with limitations that we cannot change, such as social networks that do not allow us to include accessibility features in video content, we may make the content available already with those features, such as subtitles or audio description. This is always the responsibility of all teams, not just those who produce the content, but also of designers, programmers, content designers, planners, and service teams.

Accessibility is alive! Everyone has a role to play.

### **It's suitable for everyone!**

Remember that accessibility benefits not only persons with disabilities but everyone. An example is subtitles that benefit deaf persons and people who browse in public places or at work and who cannot turn on the sound. An accessible website loads faster, is lighter, has good positioning in organic searches, and is more intuitive and easy to interact with.

Google's SEO rules, for example, consider several accessibility aspects. Google searches for information not by the image but by the information associated with it. So we must do our best to provide this information using clear and simple communication.

### **It is good for your career and for your life!**

Accessibility is a competitive advantage. The number of professionals who have this knowledge in Brazil is still small.

In addition, it gives a new meaning to work. When we realize that our content and material will impact many more people who can access them, our work has a purpose.

Working with accessibility means respecting human diversity, people's rights and being part of a transformation. That is why it is essential to spend time with persons with disabilities, listen to them, and make them part of this process by emphasizing this important motto: "Nothing for us without us".

# 10. Appendixes

## Automatic Validation Tools



Source: Freepik.com

**T**here are many tools available today for automated accessibility testing. On the W3C website, there are more than 162 Web development assistance tools. Each tool reports different numbers of errors. It is worth emphasizing, however, that none of them is magic. These tools may facilitate the detection of barriers, but they do not eliminate the need for a manual assessment, preferably done with persons with visual impairments, because they cannot detect all the barriers that exist, such as barriers in keyboard navigation or whether the description of an image is adequate. A contrast tool can detect whether the contrast is adequate between the background and text, but it cannot detect adequate contrast if there is a background image, because they select the background color of the website to do the calculation.

When it comes to mobile devices, there are fewer options. There is the *Accessibility Scanner* for Android, which manages to check the accessibility of the application, but it is still very limited.

Check out this list of automatic accessibility validators:

**WCAG Color Contrast Checker (for Chrome) –**

<https://contrastchecker.com/>

Verifies that the colors conform to the W3C standard.

**Let's Get Color Blind** – <https://chrome.google.com/web-store/detail/lets-get-color-blind/bkdgdianpkfahpkmphge-higalpighjck>

Puts a filter on the screen to evaluate limitations related to color blindness.

**Alt Text Tester (for Chrome) –** <https://chrome.google.com/Webstore/detail/alt-text-tester/koldhcllpbdfcdpfpbladbicb-gddglodk>

Checks for the presence of alternative text. Recommended for social networks and websites.

**HeadingsMap**

**For Chrome:** <https://chrome.google.com/webstore/detail/headingsmap/flbjommeqcionpdmenkdioclhjacmbi>

**For Firefox:** <https://addons.mozilla.org/pt-BR/firefox/addon/headingsmap/>

**For Edge:** <https://microsoftedge.microsoft.com/addons/detail/headingsmap/bokekiiaddinealohkmhjcgfandmcco>

Displays the header structure and allows you to evaluate each header to see if it makes sense within the context and verify that the HTML tag has been used correctly.

**Funkify** – [www.funkify.org](http://www.funkify.org)

Simulates motor limitations – the mouse shakes to simulate people with hand tremors or blurs the screen to simulate a person with low vision.

**Accessible Colors** – <http://accessible-colors.com/>

Checks color contrasts between background and text.

**Contrast Analyser** – <https://developer.paciellogroup.com/resources/contrastanalyser/>

Checks text and background color contrasts and graphic objects.

**Stark Suite** – <https://www.getstark.co/>

Checks accessibility barriers.

**Accessibility Insights for Web** – <https://chrome.google.com/webstore/detail/accessibility-insights-fo/pbjkligggf-makdaogkfomddhfmjni?hl=en>

Checks accessibility barriers.

**Google Lighthouse** – <https://chrome.google.com/webstore/detail/lighthouse/blipmdconlkpinefehnmmjamfjpmbjk>

Analyzes the quality of page accessibility.

**No Coffee (For Firefox)** – <https://addons.mozilla.org/en-US/firefox/addon/nocoffee/>

Accessibility simulator.

**Disable-HTML (for Chrome)** – <https://chrome.google.com/webstore/detail/disable-html/lfhjgihpknekohffabeddfkmoiklonhm>

Disables HTML, cookies, and pop-ups. Checks whether the lists are well made and other points of the HTML structure.

**Colorblindly (for Chrome)** – <https://chrome.google.com/webstore/detail/colorblindly/floniaahmccleocneebhhmn-jgdfijqg>

Checks to see whether there is something on the page that is only color-focused. Useful for evaluating cases of color blindness.

### **Dark Reader**

**For Firefox:** <https://addons.mozilla.org/pt-BR/firefox/addon/darkreader/>

**For Chrome:** <https://chrome.google.com/webstore/detail/dark-reader/eimadpbcbfmnbkopoojfekhkhdbieeh?hl=pt-BR>

Inverts the bright colors of Web pages, making them high contrast with dark themes.

## **Screen Readers for Testing Keyboard Navigation**

### **On Mobile Devices:**

**VoiceOver (ios)** – <https://www.apple.com/br/accessibility/vision/>

**TalkBack (Android)** - <https://play.google.com/store/apps/details?id=com.google.android.marvin.talkback>

### **On Desktop Computers:**

**NVDA (Windows, free)** - <https://www.nvaccess.org/download/>

**JAWS (Windows, free to test)** - <http://www.freedomscientific.com/products/software/jaws/>

**VoiceOver (Native MacOS)** - <https://www.apple.com/br/accessibility/vision/>

**Orca (Linux)** - <https://wiki.gnome.org/Projects/Orca/>

**Adobe Color Analyzer** - <https://color.adobe.com/create/color-contrast-analyzer>

Checks minimum contrast levels.

**Other possible tools:** braille line, Tix keyboard, native zoom.

### **Code validation and accessibility**

**ASES Web (according to eMAG)** - <https://asesweb.governoeletronico.gov.br/>

**W3C Markup Validation Service** - <https://validator.w3.org/>

**Access Monitor Plus (according to WCAG)** - <https://accessmonitor.acessibilidade.gov.pt/>

**Axe DevTools (for Chrome)** - <https://chrome.google.com/webstore/detail/axe-devtools-web-accessib/lhdoppo-jpmngadmndnejfpokejbdd>

### **WAVE**

**For Chrome:** <https://chrome.google.com/webstore/detail/wave-evaluation-tool/jbbplnplkjmmebjpifedlgcdilcofh>

**For Firefox:** <https://addons.mozilla.org/en-US/firefox/addon/wave-accessibility-tool/>

**For Edge:** <https://microsoftedge.microsoft.com/addons/detail/wave-evaluation-tool/khpceneeednkiopkkgkibb-doajpkoi>

**Accessibility Inspector (iOS)**

**Accessibility Scanner (Android)**

**Level Access** - <https://www.levelaccess.com/>

### **HTML Semantics Tools**

There are several other features that assist in the semantic verification aspect of the application code:

**MDN Web Docs (Mozilla Developer)** - [https://developer.mozilla.org/pt-BR/docs/Glossary/Semantics#sem%C3%A2ntica\\_em\\_html](https://developer.mozilla.org/pt-BR/docs/Glossary/Semantics#sem%C3%A2ntica_em_html)

Semantic glossary of the main elements of HTML

### **WAI-ARIA**

It is also a good source to improve the accessibility of Web applications, but HTML should be prioritized, combined with some WAI-ARIA attributes. <https://www.w3.org/TR/wai-aria-1.2/>

**Swift (for iOS)** - <https://www.apple.com/br/swift/>

Used in mobile development cases for Apple.

**Kotlin (for Android)** - <https://developer.android.com/kotlin?hl=pt-br>

Used in mobile development cases for Android.

**Flutter (widgets > Semantic Class)** - <https://api.flutter.dev/flutter/widgets/Semantics-class.html>



Partners



CONSTRUA COM A GENTE UMA INTERNET INCLUSIVA

MINISTÉRIO DA  
GESTÃO E DA INOVAÇÃO  
EM SERVIÇOS PÚBLICOS



MINISTÉRIO DA  
SAÚDE

