

Guidelines for authoring tools producers

This is an openly published report based on deliverables of the Pilot Project Pilot “We4Authors” on Web accessibility for web authoring tools producers and communities (LC-00788801) lead by Funka in collaboration with CTIC and funded by the European Commission.

In the report, we use the term CMS (Content management System) as synonymous to authoring tool.

WE4AUTHORS



CTIC

Funka

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Guidelines

What is accessibility

Accessibility means that all users, no matter of ability, should have the possibility to use online content and services. Another way of putting it is that accessibility is a way of making sure your website is usable for as many people as possible. Yet another perspective is that accessibility is a human right, as described in the UNCRPD.

The target audience for accessibility is not just people with disabilities. Accessibility concerns everyone. If accessibility is in place it goes unnoticed. If it is not in place, some of us will be entirely excluded from the information, some will have serious problems reading and understanding it and the rest will be rather annoyed.

Other groups that benefit from accessibility are for example many elderly, people using mobile devices, non-native speakers, users under stress and users with slow network connections. If we live long enough, most of us will experience some kind of impairment which makes accessibility important for us, either temporary after an accident or because of illness or ageing.

Accessibility in authoring tools

Digital accessibility can be divided in three parts:

- Technical/development
- UX/design
- Content

The technical part of accessibility is the code that is provided by the authoring tool, templates and other kinds of functions. Technical accessibility is especially important for users of assistive technology. If the technical accessibility fails, users with assistive technology can be totally excluded from the content. The authoring tool has a big impact on the technical accessibility.

The UX/design part is the user interface, how the website or service looks, how readable it is and how the user navigates. This is of course important for all users, but even more for users with cognitive, visual, motor or learning disabilities. The authoring tool can create problems in the UX/design of the website, especially if the templates used are not accessible. When the web author creates a form or a table using a function in the authoring tool, the result can be accessible or non-accessible depending on how the function is created.

The content part covers text, images, video, illustrations, audio and every other kind of content. This is of course important to all users, but even more for users with different kinds of disabilities. The authoring tool can support the web authors in publishing content in an accessible way, by providing tool tips and easy instructions.

Web Accessibility Directive

An EU directive is an EU-wide legislation that is implemented nationally in each member state.

The European Web Accessibility Directive is a minimum harmonization directive. The directive says that public sector bodies and other organisations that are more than 50% publicly owned, financed or managed must comply with minimum accessibility requirements. Each member state has to transpose the directive into national legislation. Countries that have had accessibility regulations before are updating their laws and countries that did not have previous legislation in the field are creating new laws. The member states are free to go beyond the minimum requirements when it comes to scope and coverage.

The scope of the directive is websites, extranets, intranets, documents and apps. There are exceptions:

- Public broadcasters (usually covered by other accessibility regulations)
NGOs, but only if they do not provide services that are essential to the public or specifically aimed at persons with disabilities
- Live video and audio
- Online maps, as long as an accessible alternative is provided for maps intended for navigation
- Third party content (out of control of the website owner)
- Reproduction of heritage collections (for example ancient manuscripts)

Member states may also exclude content of schools, kindergartens and nurseries, but not essential administrative functions.

Requirements of compliance with the directive is done stepwise:

23 September 2019

- Websites, extranets, intranets and documents published **after** 23 September 2018 shall comply with the directive.
- Content for closed groups (extranets and intranets) published **before** 23 September 2019 shall comply with the directive after they have undergone a substantial revision.

23 September 2020

- Websites, extranets, intranets and documents published **before** 23 September 2018 shall comply with the directive.
- Content for closed groups (extranets and intranets) published **after** 23 September 2019 shall comply with the directive.
- Pre-recorder audio and video published **after** 23 September 2020 shall comply with the directive.

23 June 2021

- Apps shall comply with the directive.

Enforcement

- The enforcement of the Web Accessibility Directive is done in three ways:
- Each member state regularly monitors the compliance of the Web Accessibility Directive using a methodology provided by the European Commission. The result of the monitoring is reported to the European Commission.
- Each public sector body publishes an Accessibility Statement declaring the level of accessibility of the interface in question.
- End users have the possibility to require content in alternative formats, should they not be able to Access the content on the website. If the alternative format is not provided within a reasonable time, end users can send a formal complaint to a national ombudsman or similar.

The public sector body is obliged to provide a feedback mechanism and inform about the complaints mechanism. If the public sector body does not comply and also does not provide an accessible alternative in due time, it can be fined.

Accessibility requirements

The Web Accessibility Directive states that websites and apps covered by the directive must be perceivable, operable, understandable and robust. Presumption of conformity is based on the EN301549 v.2.1.2, which contains the WCAG 2.1 AA. Annex A of the EN-standard contains a table showing which requirements are relevant for compliance with the directive. Annex C contains the determination of compliance.

User needs

In the implementation acts of the Web Accessibility Directive, 9 different user needs are covered:

- Usage without vision
- Usage with limited vision
- Usage without perception of color
- Usage without hearing
- Usage with limited hearing
- Usage without vocal capability
- Usage with limited manipulation or strength
- Minimize photosensitive seizure triggers
- Usage with limited cognition

Assistive technology

Assistive technology (AT) is a device (product or service) that help people with disabilities to overcome barriers in the society, for example a wheelchair for a person who have a difficulty walking. AT provides greater independence and is important to achieve accessibility. When it comes to ICT, AT can support users with input or output, compensating for the impairment of the user. Sometimes the AT is enhancing the form, for example dyslectics may need the content to be highlighted and visually impaired may need it magnified. Sometimes the AT transform one method of presentation to another, such as transforming text to speech or text to braille.

The list below is a high-level overview of the most common kinds of AT.

AT for input

Alternative Keyboard solutions

There are users who, regardless of assistive technology, can't use a mouse at all. They depend on keyboards. Anything that can be done with a mouse can be done with a keyboard as long as programs, applications, services and websites are constructed according to standard.

For many users however a keyboard in itself may be hard to use. The keys may be hard to hit without hitting several others at the same time, the different buttons and functions may be difficult to understand for persons with cognitive disabilities, for people with moving disabilities the buttons of a keyboard may be difficult to reach. As a result of this there are many different solutions designed to aid users when using their keyboards.

Many people with motor impairments use a virtual keyboard instead of a physical one. The virtual keyboard appears on screen where the users then click the desired keys. For people with difficulty accessing large surfaces there are smaller keyboards and for people with learning disabilities there are keyboards with programmable keys.

Please note that even if the user can use a computer without the use of a mouse there is always a need for some kind of keyboard to use it effectively.

Alternative mice solutions

Most users navigate using a mouse and most interfaces are designed with mouse navigation as a first priority. People, who suffer from rheumatism, different paralysis impairments, repetitive strain injury and so on, however may experience difficulty using a mouse. For this group of users there are a lot of different solutions. There are head mice, for people who can't move or use their arms at all. There are roll-mice, joysticks and mice with different button solutions for people who have problems handling an ordinary mouse.

Alternative input devices

For users with different kinds of motor impairments, there is a wide variety of input devices. Most of them are used together with a virtual keyboard showing on the screen. The assistive technology includes devices for the user to provide input with the voice, the eyes, the breath, a pointer attached to the head or another part of the body, buttons or clickers that are placed exactly where the user can reach them in a comfortable way etc.

Braille display

A braille display is a tactile alphabet that makes it possible to "feel" the letters thus become readable. For people who are both deaf and blind braille is the only way of accessing information via computer, but many who are severely visually impaired use braille as a complement to speech during computer use. A braille display functions basically as a speech synthesis but instead of providing information with sound it does so with braille.

AT for output

Screen readers

A screen reader's task is to transform what is displayed graphically to other forms of expression such as speech or braille. Dyslectics may have the need for text to be presented in alternate forms of

visual presentation. Blind or visually impaired on the other hand may in addition to that also need structure presented in an alternative manner. How different screen readers work depend on the disability.

Speech synthesis

Speech syntheses are often used in combination with a screen reader. It is the synthesis that transforms text to speech. The screen reader assists the user in finding the text and sending it to the synthesis while the synthesis itself converts text to speech.

Magnifying software

By using magnifying software, the visually impaired can magnify parts of or entire screens. Most browsers today have the ability to enlarge text and alter background colors. Some of them let you enlarge the page with as much as 1000 %. One major disadvantage with magnifying software is that it is easy to lose the general overview of the content.

Reading and writing support

For users with difficulty to read and write there are a lot of different assistive technologies. In addition to screen readers and speech synthesis, there is software that transforms speech to text, spellchecks, synonym suggestions and software that either present text magnified or in fonts and colors preferable to the user.

Accessibility testing

The accessibility requirements of the Web Accessibility Directive; Perceivable, Operable, Understandable and Robust are stated in the EN301549 v.2.1.2/WCAG 2.1 AA.

When testing for accessibility, you can for example use the internationally acknowledged accessibility evaluation methodology of W3C, called WCAG-EM¹.

To make sure you catch all potential accessibility issues, you need to do manual testing, but you can use automatic testing tools to support you.

To test for accessibility, each success criterion of the standard(s) must be divided into smaller parts, to cover all aspects of the requirement depending on situation and context.

For example, the success criterion 1.3.1

”Information, structure and relationships conveyed through presentation can be programmatically determined or are available in text”, can be broken down to a series of specific tests (below are just some examples):

- Text that is visually indicated to be a heading is coded as a heading
- The heading structure begins with a main heading and does not skip levels
- The heading structure is logical and represents the hierarchy of the content
- Lists are correctly coded and used in a correct manner
- Paragraphs are created correctly using the p element
- Forms are coded correctly with form elements
- Labels are linked to corresponding form object

¹ <https://www.w3.org/TR/WCAG-EM/>

- Sections of forms are grouped
- Error messages are tied to their respective form field
- Headings for tables are coded with the caption element
- Row and column headings have coded with the element
- The scope attribute is used in order to set a direction for all line and column headings

Each of the tests should then be validated as a pass or fail or not applicable. The test result can also be a partial fail, when the result can be debatable, or when the result is not a clear fail but at the same time not the best solution from an accessibility point of view. When you are uncertain about the interpretation of the result, do ask certified accessibility experts who have experience in the field to help you out.

Although the Web Accessibility Directive points to all 4 principles of WCAG 2.1 AA as presented in EN301549 v. 2.1.2, not all success criteria may be relevant to test for your tool. As a minimum, the 30 success criteria below should be relevant for testing your authoring tool. Please note that this list of success criteria is based on the W4Autors project where only prototypes were tested. Additional success criteria may be relevant for your tool.

Success Criterion	Name	Level
1.1.1	Non-text Content	(A)
1.3.1	Info and Relationships	(A)
1.3.2	Meaningful Sequence	(A)
1.3.4	Orientation	(AA)
1.3.5	Identity Input Purpose	(AA)
1.4.4	Resize Text	(AA)
1.4.5	Images of Text	(AA)
1.4.10	Reflow	(AA)
1.4.13	Content on Hover or Focus	(AA)
2.1.1	Keyboard	(A)
2.1.2	No Keyboard Trap	(A)
2.1.4	Character Key Shortcuts	(A)
2.4.1	Bypass Blocks	(A)
2.4.3	Focus Order	(A)
2.4.4	Link Purpose (In Context)	(A)
2.4.6	Headings and Labels	(AA)
2.4.7	Focus Visible	(A)
2.5.1	Pointer Gestures	(A)
2.5.2	Pointer Cancellation	(A)
2.5.3	Label in Name	(A)
2.5.4	Motion Actuation	(A)

3.2.1	On Focus	(A)
3.2.2	On Input	(A)
3.2.3	Consistent Navigation	(AA)
3.2.4	Consistent Identification	(AA)
3.3.1	Error Identification	(A)
3.3.2	Labels or Instructions	(A)
4.1.1	Parsing	(A)
4.1.2	Name, Role, Value	(A)
4.1.3	Status Messages	(AA)

User testing with persons with disabilities

For any authoring tool to provide accessibility, a close collaboration with end users are essential. Standards and regulations provide the minimum requirements, but to really understand how to create solutions that really work for all users, testing is needed. This is especially true when it comes to testing with assistive technology. For example; it is possible to download demo-versions of the most commonly used screen readers, but a sighted developer will not intuitively understand how blind users use the AT if he or she never saw a blind user in action. There is also quite a difference between what is theoretically possible to do with AT and what AT-user actually do.

Setting up a test panel

A test panel of users with disabilities should, as any other test panel, be as broad as possible when it comes to at least age, gender, level of education, geography and technical interest or maturity. All the user groups of the EN301549 should be covered:

- Usage without vision
- Usage with limited vision
- Usage without perception of color
- Usage without hearing
- Usage with limited hearing
- Usage without vocal capability
- Usage with limited manipulation or strength
- Minimize photosensitive seizure triggers
- Usage with limited cognition

Finding users

It is important to create a network of end users with disabilities who can help you test for accessibility issues during drafting, prototyping, designing and developing in an iterative way. Testing only at the end of the process will not result in accessibility. To attract end user as testers, it is important to remember that these individuals are experts. They should be paid like the experts they are and, they have the right to receive feedback about the results of the development, to acknowledge how important their input is.

The disabled persons organisations may be a good way to reach users, but remember they are NGOs, often with limited resources and many volunteers. If an organization is helping you to put together a test panel, the organization should be paid like any other service provider.

Specific accessibility needs during testing

When performing user tests with persons with disabilities, it is of course very important to understand the specific needs of the users. Make sure you ask the users about any needs they may have, like interpreter, transportation, orientation, dietary restrictions or anything else important to them. Encourage users to bring their own computer or smart phone, especially if they use AT. This make the test situation much more “real” and you can focus on testing the relevant interface or object. If the users need to accommodate to AT, settings or preferences that are new to them, the test results will be less valuable and clear. It also becomes hard for you to understand what is causing the problem detected in the tests. When users bring their own tech, this also means you have to allow more time for each test compared to if you have the same computer for everyone, since setting up will take time for each tester.

Default accessibility

Accessibility by default in authoring tools means that the tool as such does not create inaccessible code and that web authors do not have to be experts in accessibility to produce accessible content. The tool will do part of the job for them and support them in doing the rest. When you can prove that our tool is providing accessibility by default, you have a real business advantage selling to public sector within the EU, because of the legal requirements to comply with accessibility standards. In other parts of the world, like the U.S., Canada and Norway, web accessibility regulations are also covering private sector, so the market is even bigger. In 2025, the European Accessibility Act will enter into force, which will broaden the coverage of web accessibility legislation in the EU to specific products and services in the private sector as well.

Built-in accessibility features

The most obvious starting point is of course the hygiene factor of making sure that the tool does not create inaccessible code. Many accessibility problems occur when web authors create forms or tables. No matter if your tool has built-in functionality or use third party software, it must be tested and, most likely, remediated. Remember that the web author should not have to be an expert to be able to handle the functionality. There is nothing in an accessible form or table that makes it less usable or flexible. For users with AT to be able to handle the form or table, you have to get the HTML mark up right. The technical aspects of accessibility in forms and tables are to be found in tutorials from W3C:

<https://www.w3.org/WAI/tutorials/forms/>

<https://www.w3.org/WAI/tutorials/tables/>

For the mark up to be relevant, the web author will need to provide information about reading order, grouping of objects etc. But there is no reason why you should not make it easy for the web author to make the form or table work for everyone.

If the tool also provides the front end of the form or table, the accessibility requirements impacting design also applies. The starting point should be to cover the requirements of Guideline 1.4 of WCAG 2.1, making sure the relevant success criteria on use of color, color contrast, text size etc are covered:

<https://www.w3.org/TR/WCAG21/#distinguishable>

Editor accessibility

Many accessibility problems are created in the editor. If the editor you use is a third-party product like Tine MCE, you may choose a version which has built-in accessibility support, or develop a work around in the framework of the authoring tool. Make sure to check editor accessibility for at least the following WCAG success criteria, which are the ones where research has found most accessibility issues:

1.1.1 Non-text Content

<https://www.w3.org/WAI/WCAG21/Understanding/non-text-content.html>

1.3.1 Info and Relationships

<https://www.w3.org/WAI/WCAG21/Understanding/info-and-relationships.html>

1.3.5 Identify Input Purpose

<https://www.w3.org/WAI/WCAG21/Understanding/identify-input-purpose.html>

1.4.5 Images of Text

<https://www.w3.org/WAI/WCAG21/Understanding/images-of-text.html>

2.4.4 Link Purpose (In Context)

<https://www.w3.org/WAI/WCAG21/Understanding/link-purpose-in-context.html>

2.4.6 Headings and Labels

<https://www.w3.org/WAI/WCAG21/Understanding/headings-and-labels.html>

2.5.3 Label in Name

<https://www.w3.org/WAI/WCAG21/Understanding/label-in-name.html>

3.2.4 Consistent Navigation

<https://www.w3.org/WAI/WCAG21/Understanding/consistent-identification.html>

4.1.2 Name, Role, Value

<https://www.w3.org/WAI/WCAG21/Understanding/name-role-value.html>

Added accessibility functionality

The most efficient way to avoid accessibility issues is not to let them happen. When the web author uses your tool, you can make sure that it is easy to do the right thing, or hard to make mistakes. If the author gets helped while publishing, the less remediation must be done. Validating content as it is being developed is also a good way to achieve accessibility. If this is not possible, validation before publication is another opportunity. There are third-party validation tools that can be used for this purpose.

The added accessibility features can be made more or less intrusive:

A soft way could be paving the way for the author, for example:

- When the web author is structuring the content, make it easier to choose a heading than to make manual formatting, by placing headings more prominently in the user interface.
- If the author does choose bold or increased text-size, let the tool mark-up text that is separated in a way that it visually could be presumed to be a heading (first line in a page, short text that is separated by sections etc). The mark up can be presented in a similar way that spelling mistakes are marked in documents.
- Provide contextual help for remediation, explaining why the heading should be chosen.

A stricter way is more leading the author in the right direction, for example:

- When the web author is structuring the content, make it harder to make manual formatting, by “hiding” it a step further down in the menu or similar.
- If the author does choose bold or increased text-size, include a tooltip or warning that asks if it is intentional.
- Provide contextual help for remediation, explaining why the heading should be chosen.

This kind of nudging and validation can be done for the use of headings, heading structure, table attributes, form attributes, ALT-text, TITLE etc.

The different approaches can exist side-by-side and be treated as settings, connected to the level of competence of the authors. Administrators and expert users can have the possibility to change the level of limitations.

Support to the authors

No matter how much built-in accessibility features you provide, the human factor of web authors making decisions will always be affecting the result. Therefore, it is important to provide support to the authors. Especially those who do not publish content that often.

The most common way of providing accessibility support to web authors are in separate manuals. But they are rarely close by when needed, so offering the support within the tool is much more useful. For almost each step done in publishing, the web author can make a choice that affects accessibility. Therefore, the support should be contextual and placed close to the functionality used. Make it easy to find the support needed, so the author does not have to leave the interface and look somewhere else to find the relevant information.

Accessibility is often perceived as technical and difficult. Reading technical standards is complex and many authors do not have the background or interest to grasp what a certain success criterion means that they have to do in the actual situation. A wizard, showing how to perform a task in a stepwise manner, with a combination of illustrations or animations, is often preferred.

Training and resources

There are several ways to enhance your internal knowledge about accessibility and a wide variety of resources that can be used. There is a whole industry providing all sorts of training, testing and support, but also resources that are free of charge.

One particularly valuable way of ensuring that your staff has the right competence is to make sure they are certified in web accessibility by the International Association of Accessibility Professionals, IAAP.

<https://www.accessibilityassociation.org/certification>

You do not need to be a member to be certified, but membership is of course a good way to keep up to date with what is happening in the industry and also a very good opportunity to get in contact with the thought leaders of the industry.

<https://www.accessibilityassociation.org/>

To prepare for the certification exam, the body of knowledge which contains the building blocks of the certification is free of charge.

<https://www.accessibilityassociation.org/exampreparation>

There are also accredited training providers that offer preparatory courses.

<https://www.accessibilityassociation.org/exampreparation>

There are also other free online training resources in web accessibility, for example:

W3C training:

<https://www.w3.org/blog/category/training/>

ITU training:

<https://www.itu.int/en/ITU-D/Digital-Inclusion/Persons-with-Disabilities/Pages/Self-Paced-Online-Training-on-ICT-Accessibility.aspx>

MOOCAP training provided by 8 European Universities, funded by the EU:

https://moocap.gpii.eu/?page_id=839

Webaim has a list of online resources

<https://webaim.org/resources/>