ADVANCED LEVEL: Creation of accessible resources to support teaching and learning

Participant version

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Table of Contents

1. ADVANCED LEVEL: Creation of accessible resources to support teaching and learning 2

1.1 Accessible content creation 2

1.2 Easy check of webpage (text, font and colour contrast) 16

1.3 Plain language and easy to read 17

1.4 Multimodality 19

1.5 Simplification – less is more 20

1.6 The importance of user involvement to ensure accessibility 23

1.7 Understanding what we have learnt: Now it's your turn! 26

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1. ADVANCED LEVEL: Creation of accessible resources to support teaching and learning

The learning objectives for this module include:

- To gain an overview on how to produce accessible digital content.
- To discover how to create specific accessible content in different formats: text, images, video, audio, PowerPoint, pdf.
- To learn how to carry out a quick and easy accessibility check of a website.
- To understand the difference between plain language and easy to read.
- To highlight the importance of multimodal communication and "less is more" concepts.
- To provide an introduction into co-creation as a tool to work with target audiences.

1.1 Accessible content creation

1.1.1 Text

- Structure and formatting
    - To create accessible content, the structure of the text is essential. An article usually contains:
    - a main heading
    - a preamble
    - subheadings
    - a text body divided into sections and

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- specific formats such as bullet points.

These structural elements are important to all readers, as they make reading easier and faster.

When using Microsoft Word or other word processing tools, in order for users with assistive technology to be able to get the same structure as other users, these elements need to be created using the formatting tools provided, and not just visually altered.

For example, a blind user using a screen reader will be able to skim through and get an overview of the content, be able determine whether it is relevant or not, and also to find the right place to start reading, only when headings are created and formatted in the appropriate way (H1, H2 in Word etc). If you make the text bold or large without using the formatting tool, the structural elements are hidden for visually impaired users, and the text becomes just one very long line of words with no structure at all.

It is a very good idea to use pre-defined templates, to make sure all content creators do this the right way. If your Word document is correctly structured, it will be much easier to convert it into an accessible PDF.

The choice of font is less important than contrast, text size and spacing of characters. The favourite fonts of users are very individual and have to do not only with the visual ability but also habit. A "new" or unusual font is often perceived as harder (or slower) to read. Before the digital revolution of assistive technology, it was commonly thought that sans serif fonts (without "feet": like Arial) were easier to read than serifed fonts (with "feet": like Times New Roman). However, there is no valid research to support this when it comes to reading on a screen.

The size of a font is described in point size. Regular print is usually 10 or 12 point. Large print is generally 14-to-18-point size. Giant print is anything larger than this.

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Remember that different types with the same 'point size' have different appearing sizes. The effective size of a typeface is actually related to the height of the lowercase x.

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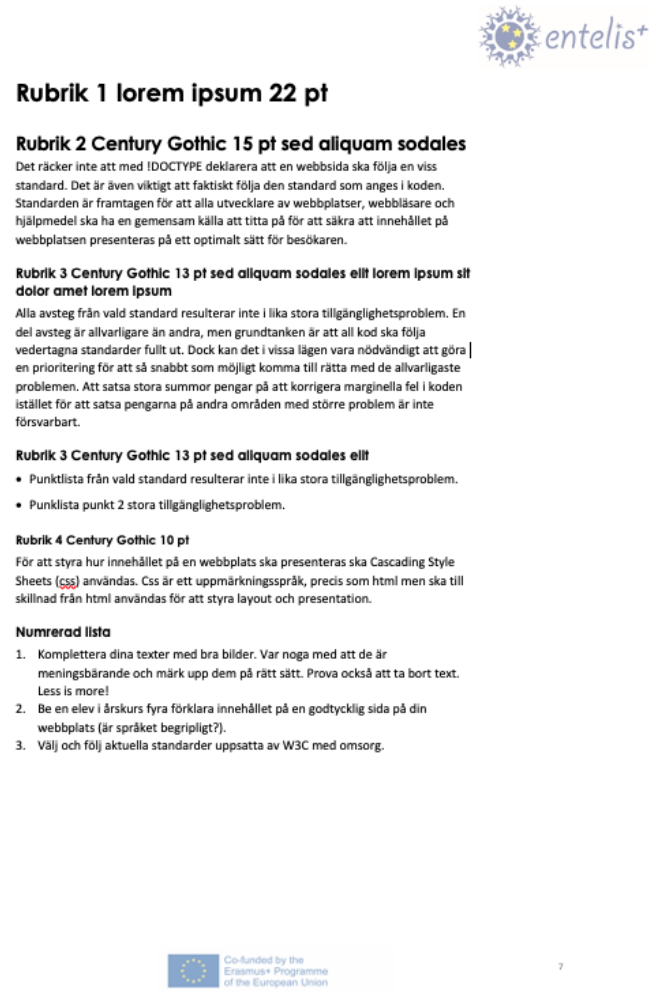
An example of an accessible text template in Microsoft Word



entelis+

Rubrik 1 lorem ipsum 22 pt

Rubrik 2 Century Gothic 15 pt sed aliquam sodales

Det räcker inte att med !DOCTYPE deklarera att en webbsida ska följa en viss standard. Det är även viktigt att faktiskt följa den standard som anges i koden. Standarden är framtagen för att alla utvecklare av webbplatser, webbläsare och hjälpmedel ska ha en gemensam källa att titta på för att säkra att innehållet på webbplatsen presenteras på ett optimalt sätt för besökaren.

Rubrik 3 Century Gothic 13 pt sed aliquam sodales elit lorem ipsum sit dolor amet lorem ipsum

Alla avsteg från vald standard resulterar inte i lika stora tillgänglighetsproblem. En del avsteg är allvarligare än andra, men grundtanken är att all kod ska följa vedertagna standarder fullt ut. Dock kan det i vissa lägen vara nödvändigt att göra en prioritering för att så snabbt som möjligt komma till rätta med de allvarligaste problemen. Att satsa stora summor pengar på att korrigera marginella fel i koden istället för att satsa pengarna på andra områden med större problem är inte försvarbart.

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- Punktlista från vald standard resulterar inte i lika stora tillgänglighetsproblem.
- Punklista punkt 2 stora tillgänglighetsproblem.

Rubrik 4 Century Gothic 10 pt

För att styra hur innehållet på en webbplats ska presenteras ska Cascading Style Sheets (css) användas. Css är ett uppmärkningsspråk, precis som html men ska till skillnad från html användas för att styra layout och presentation.

Numrerad lista

1. Komplettera dina texter med bra bilder. Var noga med att de är meningsbärande och märk upp dem på rätt sätt. Prova också att ta bort text. Less is more!
2. Be en elev i årskurs fyra förklara innehållet på en godtycklig sida på din webbplats (är språket begripligt?).
3. Välj och följ aktuella standarder uppsatta av W3C med omsorg.

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1.1.2 Lines of text

Another important issue is line length/width. Research shows that even experienced readers read significantly slower if the lines are too long/wide. For users with reading- and writing disabilities, dyslexia, learning impairments or cognitive disabilities, long/wide lines can be anything from very cumbersome to a difficult barrier. Also, low vision users who use magnification tools benefit from reasonable line length/widths.

The recommendations for web accessibility line length is 80 characters or glyphs. Keep sentences short and to the point. Studies have shown that Chinese, Japanese and Korean (CJK) characters are approximately twice as wide as non-CJK characters when both types of characters are displayed with

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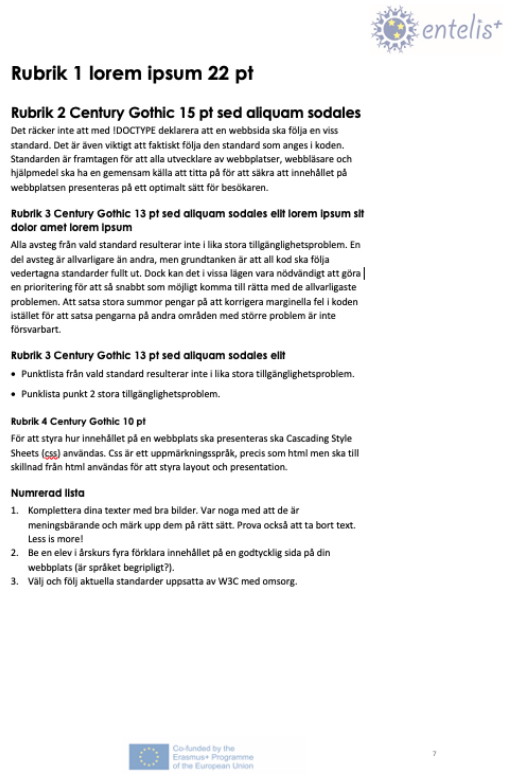
characteristics that achieve the same readability, so the maximum line width for CJK characters is half that of non-CJK characters (40 CJK)

To enhance readability, it is important to let the text flow in a natural way. Text that is both left and right justified is usually harder to read and follow. The uneven spacing between words in fully justified text can cause "rivers of white" space to run down the page making reading difficult and, in some cases, impossible. Text justification can also cause words to be spaced closely together, so that it is difficult for them to locate word boundaries. Therefore, text must not be justified (e.g., not aligned to both the left and the right margins).

An example of non-justified text



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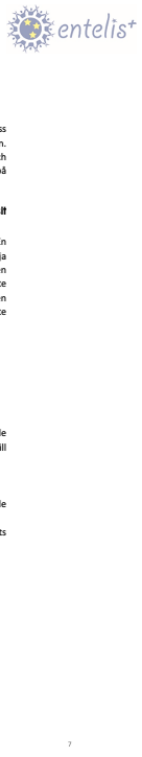
An example of justified text



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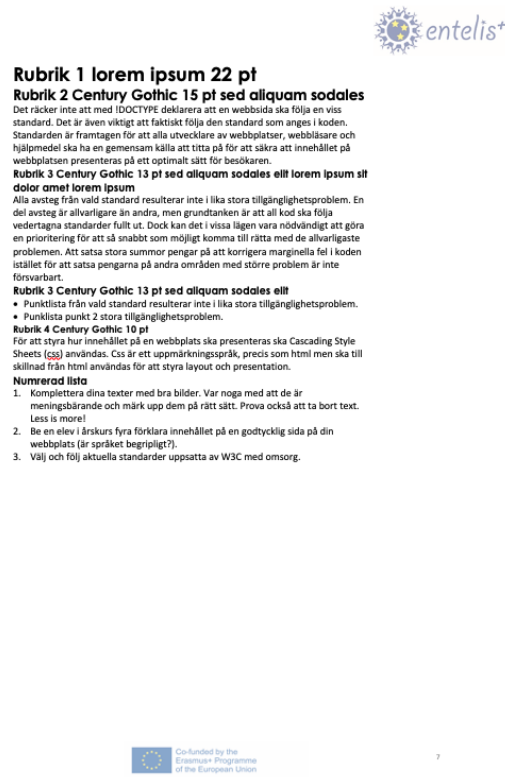
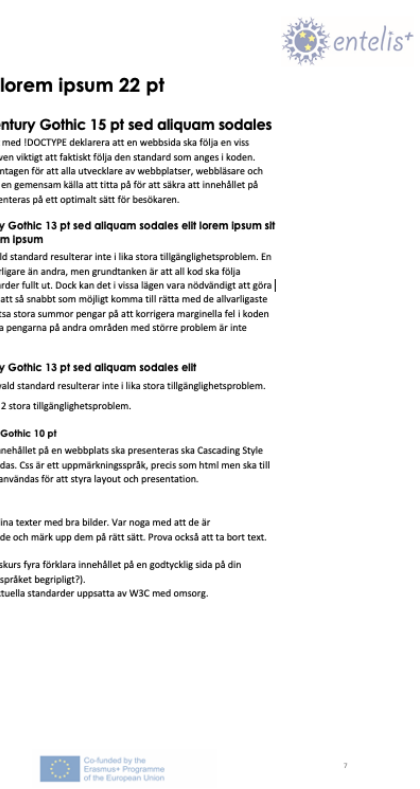
Line spacing (leading) is another important issue for enhanced readability. It may be difficult to track text where the lines are close together, especially for visually impaired, some cognitive impaired users and users with reading and writing disabilities. Providing extra space between lines and paragraphs allows users to better track the next line and to recognise when the end of a paragraph is reached. The recommendation is for the spacing to be at least space-and-a-half within paragraphs, and paragraph spacing is at least 1.5 times larger than the line spacing.

An example of insufficient spacing



An example of sufficient spacing



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Additional reading:

"How headings help screen reader users", NC State University

Predefined accessible templates in Microsoft Office

1.1.3 Images

Images make content easier to understand for many people, support readability and often improve design. For visually impaired users, images must be described in text alternative, a so-called ALT-text. The ALT-text will be presented to users with assistive technology such as screen readers.

- **1.1.3.1 How to write an alternative text**

The ALT-text should convey the meaning (content and function) of the image. Try to be specific but keep it short; many screen readers stop reading after 125 characters.

There is no such thing as a perfect ALT-text, as the precise wording needed may depend on the context. For example, a photo of Ursula von der Leyen in a news article could have the ALT-text consisting of her name and title. But if the President is making a presentation outdoors, the setting could be relevant as well ("a seemingly cold President von der Leyen is making a presentation under heavy snowfall"). If she has been awarded a prize for her new fancy dress, the clothes should definitely be described.

You don't need to include "picture of" or "image of" in the ALT-text. Screen readers automatically tell the user that it is an image. For example, the ALT-text "Image of an apple" would be read out loud by a screen reader as "image, Image of an apple".

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An example of an appropriate ALT-text for an image

Suggested ALT-text for the above image: "A person in a wheelchair at the bottom of a set of stairs and two escalators."

- **1.1.4 Decorative images**

All images must have an ALT-text. A decorative image or layout element that does not convey any meaning or important information, should have an empty ALT-attribute.

Additional reading:

In depth information about ALT-text

1.1.5 Video

To make your videos are accessible, you need to provide captions of the spoken dialogue. Depending on the content and context, you can:

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- chose to buy professional captioning from a specialist
- can caption yourself using a free online tool or a professional software, or
- use the built in or separate automatic captioning services free of charge.

Many of the automated tools are good enough for live streaming, and the more they are used the better they become, by machine learning.

Captions can be open (shown always, as part of the video) or closed (shown on demand). As the captions may disrupt the focus for some users, it is recommended to always use closed captions (CC).

Captions should contain information on who is speaking and also describe important/meaningful background sounds. For example, if someone is waiting for a train and the sound of a train is heard before the train is seen, the sound should be captioned [train approaching]. If the film sequence is taking place in a noisy train station, the background sound may create a feeling of stress or excitement, but each train sound does not reveal meaning. Therefore, the captioning must be created according to the situation and not all background noise should be captioned, as it may overwhelm the user with information that does not necessarily enhance the understanding of the content.

If text is shown in the video, make sure the speaker reads it out loud, otherwise you need to provide an audio description of the written content for people who are unable to see it.

Of course, the text must also be visually readable, following the recommendations of fonts, size, and contrast between the text and background.

Avoid strong background sounds, as that may interfere with spoken dialogue. It is usually better to have either music, background sound or dialogue/speaker, and try to keep them separated.

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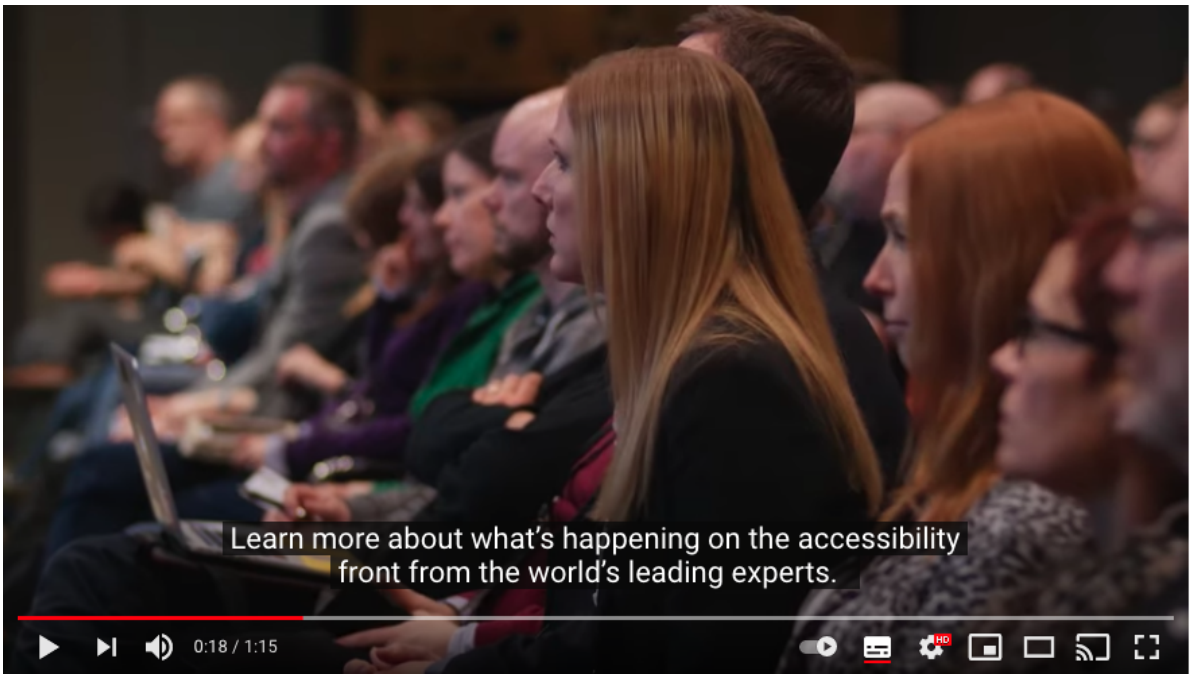
Hard of hearing users and cognitively impaired users may use mouth movement to help understand spoken language. When feasible, ensure that the speaker's face is visible and in good light.

Example of closed caption on a video on YouTube (Source: Funka)



1.1.6 Audio

Following the same guidelines as when creating audio for videos, avoid strong background sounds, as that may interfere with spoken dialogue. It is usually better to have either music, background sound or dialogue/speaker, and try to keep them separated.

If the audio is to be accessible to all, the content needs to be transcribed and provided via text.

1.1.7 PowerPoint

Many users with assistive technology struggle with PowerPoint presentations, (ppt). Therefore, it is often a good idea to provide an alternative format, especially if the ppt is made for giving a presentation. Ppt tends to be highly

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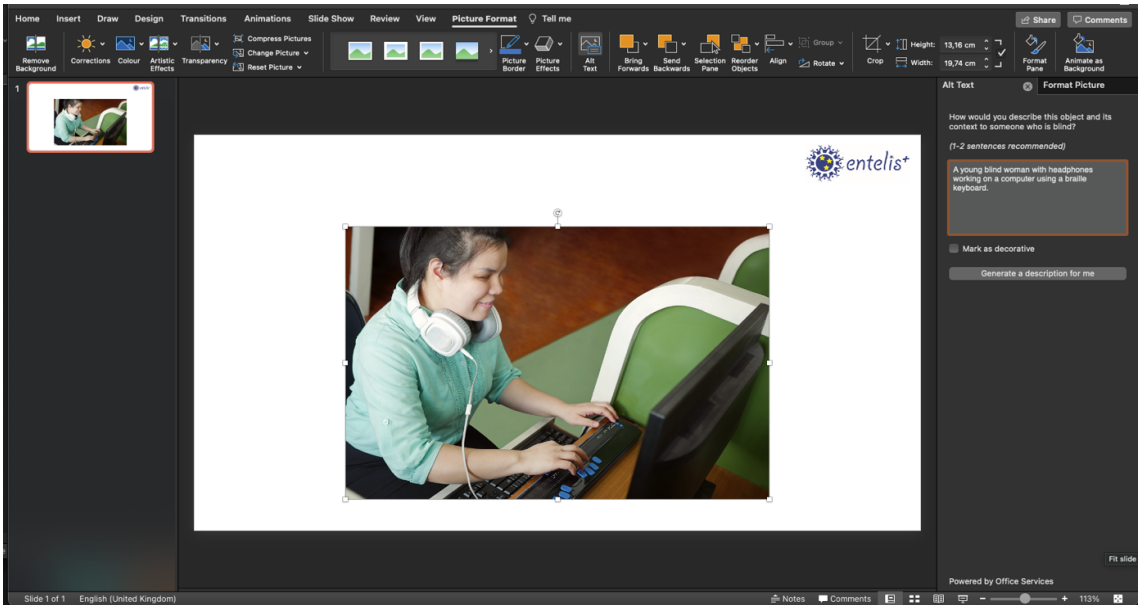
visual, so even with a technically accessible ppt, visually impaired users may need extra information to perceive the content.

When ppt is used for presentations, it is extremely important to remember that less is more. Slides cluttered with information makes the user start reading instead of listening to the speaker. Packed slides also make them harder to read for any user, and especially visually impaired and persons with reading-disorders, dyslexia etc.

Make sure to use sufficient font size (a rule of thumb is not smaller than 18 pt)

As in any document, meaningful (non-decorative) images need ALT-texts to be understood by visually impaired users.

Adding ALT-text to images on Microsoft PowerPoint



For assistive technology users, it is important that the reading order is coherent with what is seen visually on each slide.

For specific links with instructions on making PowerPoint presentations accessible to people with disabilities:

[Make your PowerPoint presentations accessible for people with disabilities]

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1.1.8 PDF Documents

Apart from the general accessibility requirements on text structure, colour contrast etc, the PDF document needs to have the technical set up that allows users with assistive technology to navigate and understand the content. In PDF, these elements are called "tags".

PDF documents can derive from four different kinds of sources:

- Manually, from an author creating a text document (for example in Word) and converting it to PDF
- To make sure manually created text documents are accessible, it is key to start with a good source. When the Word (or similar) document is created in an accessible way, it is much easier to make the PDF accessible as well. In this case, training manuals are needed.
- Manually, from a designer creating an design document (for example in InDesign) and converting it to PDF
- If you order a designed PDF document from a marketing company or similar, you need to make sure they meet the accessibility requirements. When the document is received, you probably need to control its compliance. In this case, you need to be able to make an assessment of the accessibility of the document.
- Automatically created PDF documents from internal systems
- If you have an internal system that produces PDF-files, it may be hard to remediate the outcome. Probably, the best solution is to talk to the supplier of the system and require them to provide accessible documents.
- Photos or scans of documents, shown in PDF format

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- If you scan any document, it may end up in the format of PDF. But the content of the scan is just an image of content that can never be made accessible.

1.1.9 Software needed

To be able to create or remediate the accessibility of PDF documents, you need to use Acrobat Pro, Nuance or Foxit.

WebAIM has very good manuals for both creating and remediating PDF documents with Acrobat Pro:
https://webaim.org/techniques/acrobat/converting

1.1.10 Accessibility in action: Google

Designing for people with disabilities.

According to Eve Andersson, Director of Accessibility Engineering at Google, accessibility is part of Google's core mission to catalogue the world's information and make it available to everyone. "Accessibility is a human right, it benefits everyone".

Some of the accessibility issues google has tackled through innovation include:

- contrast minimums required for people with low vision. They also help all people see in bright light glare situations such as sunlight.
- auto-complete, initially provided to help people with disabilities to use computers, is now widely used by all.
- voice control, implemented for users with physical impairments, is now used by a far greater audience.

Google is also making progress in accessibility using:

- artificial intelligence, progress is based on research originally done to provide visual context to users with visual impairments.

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- auto-captioning using machine learning. Whilst this has caused problems for some deaf users with many feeling it is inadequate for its cause, progress is still being made and machine learning itself is steadily improving.

Source:

Case Study Google, Web Accessibility Initiative (W3C)

How designing for disabled people is giving Google an edge, Fast Company

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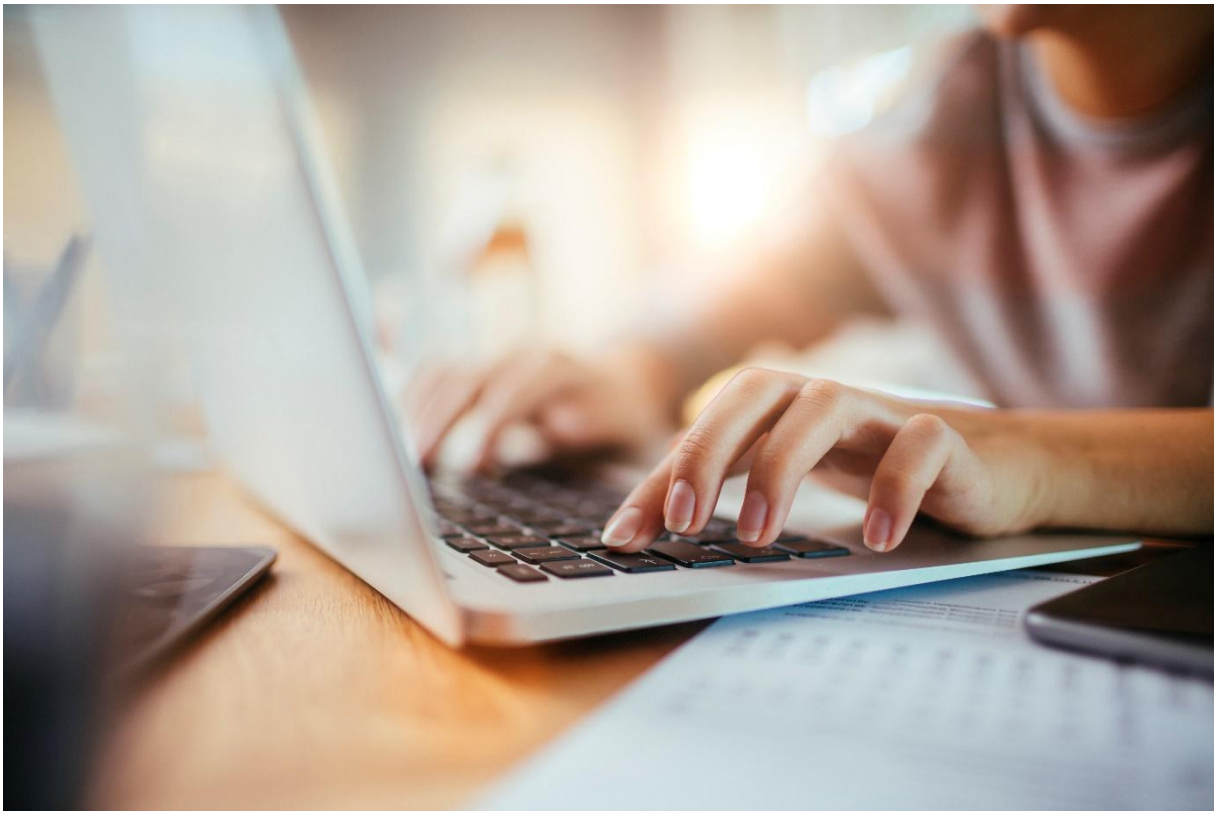

1.2 Easy check of webpage (text, font and colour contrast)

There are plenty of free resources to check the accessibility of a website. Please remember that these tools do not identify all accessibility problems, a real accessibility audit requires manual checking. Even so, there are many relatively simple checks you can easily do yourself, without being an expert:

With a colour contrast analyser tool, you can determine if the contrast is sufficient between background and foreground. There are several free tools:

- https://developer.paciellogroup.com/resources/contrastanalyser/
- https://webaim.org/resources/contrastchecker/
- https://chrome.google.com/webstore/detail/color-contrast-analyzer/dagdlcijhfbmgkjokkjicnnfimlebcll

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A more comprehensive free tool is:

- https://wave.webaim.org/

The code validator is a good start to determine whether the website follows the technical standards, which are important for assistive technology:

- https://validator.w3.org/

Independent listing of the tool market:

- https://www.w3.org/WAI/ER/tools/

1.3 Plain language and easy to read

Plain language is a way to write so that most people understand your message, whereas easy to read is a way to write that is developed specifically for people with intellectual and/or learning disabilities, but other target groups can also benefit from the format.

Plain language can be defined as "Writing that is clear, concise, well-organised, and follows other best practices appropriate to the subject or field and intended audience." The exact definition tends to differ between languages depending on the parts of the language that pose the most difficulties to readers.

Some basic principles that should be possible to adapt in most European languages:

- Start with the major point before going into details.
- Write for your reader.
- Limit each paragraph to one idea and keep it short.
- Write in active voice.
- Use short sentences as much as possible.

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- Use everyday words. If you must use technical terms or abbreviations, explain them on the first reference.

Easy to read is also approached differently in different language areas, and discussions on how one can claim that something is easy to read has been going on for decades between experts, researchers, users, caregivers and other stakeholders. One "school" promotes the concept of science and independence, there must be clear principles or checklists to follow to make something easy to read. Another "school" says that the only way to know if something is easy to read is to let the target audience decide. Many countries have their own principles, and the umbrella organisation Inclusion Europe has its own checklist. Spain has made an easy-to-read standard (in Spanish) and so on. But in essence, these items are often part of the basic idea of what makes something easy to read.

The easy-to-read text

- has an airy layout
- is short, that is, excludes things that are not necessary for the whole
- has a personal address
- has a varied sentence length
- contains words that make the sentences stick together (so-called sentence connectors)
- avoid long nouns
- avoid foreign words
- explains connections
- avoids passive form
- avoids abstract concepts

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Additional reading:

Easy-to-read checklist, Inclusion Europe

Easy-to-read explanations, Inclusion Europe

Definition of plain language, Wikipedia

Plain Language International Association

1.4 Multimodality

Multimodality means the use of a variety of ways, formats or modes to convey meaning. You could say that it contains a mix of textual, oral, linguistic, spatial, and visual resources to compose a message. This concept is made easier to accomplish with digital tools, but it has been around for a long time.

For example, a typical weather forecast presented on TV involves speech, text, weather specific language, geography, symbols and often gestures when the presenter points to the map. This is a very inclusive way of presenting information, as the audience gets multiple ways or modes to understand the message. Everything from the placement of images to the organisation of the content to the method of delivery creates meaning. This is the result of a shift from isolated text being relied on as the primary source of communication, to a broad variety of formats that support each other and let the user decide what fits best.

The focus of multimodality as a means of making content accessible is letting users decide in what format they prefer to approach the content.

Many users have problems with text and/or language. There are ways to make the texts easier to understand, but no matter how well the text is processed, it will not reach all users. YouTube and Google share the position as being the top search engine, which is a clear sign of how important video and audio is to the general public. Research shows that when offered a choice of formats containing equivalent content; 50-60% of the average user groups prefer text, 20-30% prefer images or video and around 10% prefer audio. So, if you want to

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make sure to reach all users, the best way is to provide text, images, audio and video.

Easy examples here:

Multi-modal communication: writing in five modes, Open English, Pressbooks

1.5 Simplification – less is more

When informing or communicating something that is important to you, or something you are knowledgeable about, it is often easy to produce a lot of material with many details. If you as a receiver of information are very interested in or curious about the topic, you will probably like the feeling of diving into an ocean of knowledge. But you may also be overwhelmed. Modern society rarely suffers from a lack of information. Rather, it is too much of

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everything that makes it hard for users to navigate and find the content they really need.

This goes for a website or document as well. A public sector authority website can easily contain 40,000 pages. You may ask yourself if all of them are strictly necessary?

For the user to have a chance to grasp your message, it is often a good idea to start with the most important part and work from there. This way, most users will get a small proportion of relevant information, and those who need more will surely keep on reading. For details, rules, background or in-depth explanations, it may be better to link to further resources, keeping the initial page or section like an introduction or summary. Evidently, the exact way of doing this depends on the nature of the content.

This concept is best practice to support all users, notably for people under stress. But it is very important for some groups. For people with reading or learning impairments, cognitive disabilities, the way the content is presented may determine whether a person even starts to read or not, let alone continue reading and understanding the information.

To best reach these target groups, less is usually more when it comes to the way content is presented. This does not mean that you can take important parts of the content away, only that you can make sure to present one thing at a time. A stepwise approach is usually the most successful one.

The concept of simplification works on several levels:

- When writing easy-to-read texts, you stick to "one idea = one sentence".
- When writing plain language texts, you make sure that the text is divided into sections.

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- When choosing your words, try to use terms that most people understand, and keep the specialist lingo to the in-depth information aimed for experts.

- When designing a web page, you take out unnecessary information, advertisements and other items that can interfere with the focus of the reader.

- The layout of a webpage may be hard to impact as an author, but there are things you can do. Not peppering your text body with links may be the most basic example. Present the links after the text/section instead.

- On the structural level, there is always a balance between breadth and depth. If you have a lot of information, you either make the user scroll a lot or click many times. Either way, the user risks losing overview. Therefore, you always need to ask yourself; "is this text necessary?" before publishing it.

- Another tip is to get rid of content that is not updated, as it may confuse the user.

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1.6 The importance of user involvement to ensure accessibility

The best way to make anything accessible is of course to work closely with the target audience. This means starting and ending with user needs. No product, service or information should be created because your organisation needs it, but because your users, customers or citizens need it. Far too often, an internal perspective is influencing decisions. There are standards, guidelines and regulation on digital accessibility. That is of course a good start. But however important, these checklists can only provide you with the baseline, the minimum for compliance. But if you really want to make sure that the product, service or information you are developing is possible to use for everyone, you need to involve users in the process. And when involving users, you need to make sure the group of users contains people with disabilities.

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Involvement of users can happen in different ways, like focus groups, surveys, interviews, user testing and so on. One specific method of user involvement is called co-creation.

The principle of co-creation is the process of creating products, services or information **with** people and not **for** them, which also complies with the principles of the UNCRPD and the disability movement approach '*nothing about us without us*'. You could also define it as collaborative development of new value (concepts, solutions, products and services) together with experts and/or stakeholders (such as customers, suppliers etc.). Co-creation is a form of collaborative innovation: ideas are shared and improved together, to benefit all.

This can be applied in commercial companies where customers or consumers are invited to make sure products are meeting user needs and thereby become a commercial success. In the public sector, the concept has been very popular as a way of ensuring public funding is spent in an efficient way, to benefit all citizens. Co-creation is often used in research projects as well.

Co-creation as such doesn't fix all problems, but by involving people with disabilities into your innovation and development phases, your quality assurance testing and/or your validation processes, you will definitely get new perspectives and the chance to avoid unnecessary mistakes.

1.6.1 Accessibility in action: BBC iPlayer

A website developed with compliance standards in mind is not automatically accessible. You need to test it with users!

This is the case of the BBC iPlayer that, whilst being a technically compliant page with regards to accessibility standards and guidelines, it was not very usable for people with disabilities. Accessibilities standards and guidelines should form part of an accessibility framework that also takes into account user experience, development and quality assurance.

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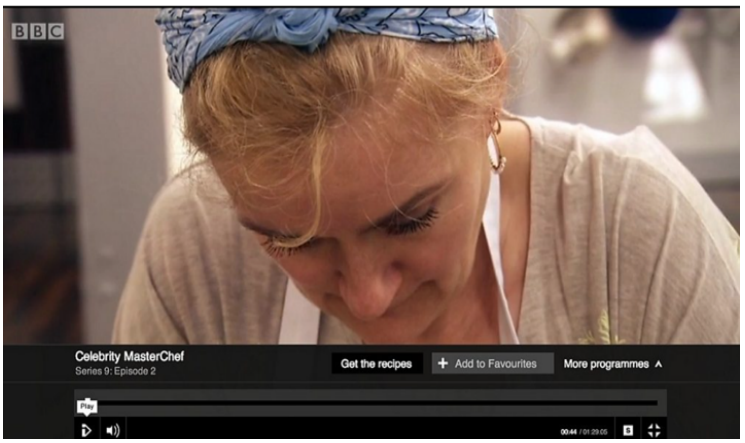
Following the accessibility problems experience on the website, the BBC iPlayer was re-designed, this time with a focus on inclusive design following four main principles:

- **Give users choice:** do not assume that just because a user Can access content in one specific way that they want to access it in that way.
- **Put users in control:** Always ensure that the user has control.
- **Design with familiarity in mind:** Establish a balance between the new and the familiar.
- **Prioritise features that add value:** accessibility should incorporate helpful features that add value for all users, particularly those users with disabilities.

One obstacle that was overcome by the redesign was how users were able to find their favourite show without having to search the website. An option was added allowing users to sort and list favourites, greatly improving the user experience. In fact, it was the single most requested feature from users with disabilities.



Source:

"Standard Media Player: accessibility", BBC Technology and Creativity Blog

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"Making the new iPlayer accessible for all", BBC Technology and Creativity Blog

"Accessibility Originates with UX: A BBC iPlayer Case Study", Smashing Magazine

1.7 Understanding what we have learnt: Now it's your turn!

Using Microsoft Word, open a new workbook and try creating your own accessible word document. This can be done using existing content, the focus here is on accessibility:

- Add headings using the formatting feature.
- Add an image and the appropriate ALT-text.
- Ensure the lines of text (length and justification) are correct.
- Ensure line spacing is correct.
- Visit YouTube, or any other platform where you can access audio-visual content:
    - Select a video that is less than one minute.
    - Write the closed captions for the video you have chosen.
- Choose a website. Using one of the free tools highlighted in the previous chapter:
    - Carry out a basic accessibility check of the website.
    - What conclusions can you make about the accessibility of the web page (introduce checks and knowledge that you may have learnt from other modules of this course)

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