



The State of Web Accessibility at CERN

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Digital Accessibility Workshop
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Background: study on web accessibility

- Post-graduate studies on Human-Computer Interaction and Usability, University of Nottingham

Development of Web Accessibility Recommendations for CERN

Catharine Noble, 2021

<https://doi.org/10.5281/zenodo.5744899>

- Research questions
 - What evidence is there of web accessibility considerations at CERN?
 - What might be driving the situation?
 - What recommendations for Web Accessibility might be relevant?

Overview of today's talk

- Based on my study 😊
- Background: web accessibility, assistive technologies, impact
- Legal frameworks
- Web accessibility considerations at CERN
 - Formal structures or support
 - Summary of questionnaire/discussion to understand mindset
 - Summary of website evaluations
- ~~Discussion of data – v – Literature review~~
- ~~Recommendations~~
- The conclusion

What is Digital Accessibility

- Web Accessibility Initiative (WAI) [definition](#) underpinning the [Web Content Accessibility Guidelines](#) (WCAG)

“Web accessibility means that websites, tools, and technologies are designed and developed so that people with disabilities can use them.

More specifically, people can; perceive, understand, navigate, [...] interact with the Web, [and] contribute to the Web”

- Making same content accessible and useable with alternative methods
 - Content, structural, and design choices
 - Compatibility with assistive technologies

What is assistive technology?

- **Alternative methods to interact with websites**
- Helps impaired users depending on what is needed.
 - Screen-readers
 - Keyboard navigation
 - Input devices - Mouth-wands, eye-tracking software, voice recognition
 - Functions - Slow/sticky keys (eg. difficulties maintaining pressure on keyboard)
 - Live captioning and transcripts
 - look at your Accessibility settings on your device!
- **Only helpful if website has been designed and developed to take these technologies into account**

Lack of Web Accessibility: user impact

- **Websites are not always designed to allow for different interaction methods.**
- Top causes of frustration for (eg) screen-reader users
 - Poor page layout = screen-reader confusion,
 - Unlabelled forms - unclear what to fill in where,
 - No descriptive or html alternative (“alt”) text for images.
- **Uncertainty, reduced mobility, confusion and cognitive overload**
- Impaired users **waste on average 37% to 50% of their time^[i].**

[i] Lazar, J., Allen, A., Kleinman, J. and Malarkey, C. (2007) What Frustrates Screen Reader Users on the Web: A Study of 100 Blind Users *International Journal of Human-Computer Interaction* 22(3): pp.247-269.

Legal Frameworks (and acronyms)

- The [Web Content Accessibility Guidelines \(WCAG\)](#)
- From the [W3C Web Accessibility Initiative \(WAI\)](#)
- Bedrock of all national and international law

- ISO standard [ISO/IEC 40500:2012](#), and EU standard [EN 301 549 for ICT](#).
 - Explain **user-centric issues** around text, sound and image,
 - **Technical aspects of mark-up** to provide the necessary support for assistive technologies.
 - Set **compliance objectives** with 3 levels, from A (bare minimum) to AAA (top-level), along with validation tools to provide automatic evaluation.

- [Web Accessibility Directive](#) (Directive (EU) 2016/2102) (**WAD**)
 - **European Union law.**
 - National law in all EU member states since **2018**.

Web accessibility considerations at CERN

(based on 2021 research study)

- Formal structures/policy
- Discussion/interview summaries
- Website evaluation



Formal structures/policies at CERN

- [CERN Diversity Policy](#)

- High level general verbal commitment on diversity in general
 - Highly valued
- No mention of digital accessibility considerations
 - Mentions disability in the form of ensuring diversity principles are applied
 - Includes “meeting the special needs of disabled individuals”.
 - States that it benchmarks best practices with comparable organisations within CERN’s Member States.
- No follow-up information or references seem to be (publicly) available.

Formal structures/policies at CERN

- CERN Recruitment Policy

“Inclusion / Accessibility

*The recruitment process should be fully accessible and support candidates who require reasonable adjustments. Adhering to **W3C standards** for the web interface will ensure **colour-blind** or people with **reading difficulties** may still apply. Alternative methods of application should be provided for candidates who require reasonable adjustments who are **unable to apply via the online application form**. Every effort should be made throughout the application, selection through to hiring process to accommodate these requirements.”*

- Accessibility statement exists – encouraging sign! But....
 - No reference to which “**W3C standards**” Maybe meant WCAG? WAI? WAD?
 - No reference any **compliance level** implemented or aimed for
 - **Other impairments exist** affecting web interaction/accessibility beyond visual, not mentioned
 - No reference to **CERN standard or policy**
- Compare with WAI’s “[Developing an Accessibility Statement](#)” and [HSBC’s web accessibility policy](#)
- Expectations of understanding of requirements, standards, implementation etc. at CERN

Formal structures/policies at CERN

- Informal support

- Within technical/dev communities at CERN
 - Build documentation on [Web Services Portal](#), [drupal-docs](#) etc
 - Minimal reference of web accessibility; some bits, nothing connected
- Update since 2021 study: two efforts in 2023
 - “[Guidelines for CERN websites](#)”, CERN Design Guidelines (branding) (IR-ECO)
 - External website checklist linked in a footer
 - Diversity & Inclusion website
 - [Learning](#) section includes Web Accessibility notes (since May 2023)
- Ad-hoc unconnected efforts, do not offer centralised policy or official recommendations.

Formal structures/policies at CERN

- Training

- CERN Learning Hub
 - “accessibility”, “disability”, “inclusive”, “design”
 - = 4 records on gender issues and leadership.
- No CERN training relating to digital accessibility principles.
- Just today’s workshop...



Interview/Questionnaire results

- Questionnaire + open-ended discussion on (eg):
 - *What do you understand or perceive as Web Accessibility*
 - *Do you think CERN as a whole understands web/digital interface accessibility for people with impairments?*
 - *Have you seen any examples you thought were good? Or indeed, any examples / experiences where you thought this might be a problem?*
- Results 1: Perceived issues/mindset around disability
 - Not many users with impairments, disability was invisible unless personally affected, the most impacted people the most invisible
 - Attractive websites were not perceived compatible with accessible websites.
- Results 2: Perception of organizational issues
 - Lack of awareness or commitment at CERN
 - Lack of training, lack of dedicated budget
 - Not a priority, no-one's responsible
 - CERN silo effect

Sample responses

- “We speak a fair bit about diversity and inclusion, but digital inclusion is **never a part of our dialogues** [...] CERN - and many more organisations - care a lot about wheelchair access, but don't realise that people with visual impairment have **similar challenges** with regard to software.”
- “I’ve encountered many occasions where users had difficulties with our systems but already **lost hope** that we could provide something that would work for them. They **take inaccessible systems for granted** and consider it **part of their CERN life.**”
- Use-case: a user was offered a job contract at CERN but they refused because of issues around accessibility.

Automatic website evaluation (2021)

- WAVE (Web Accessibility Evaluation Tool)
 - <https://wave.webaim.org/>
 - Identify WCAG compliance level, highlight issues to be resolved
 - Alerts and Fails (both of concern!)
- Evaluated homepages of 5 CERN websites
 - Most visited (eg. public)
 - Browser-based internal administrative CERN tools
 - Different web technologies (avoid developer bias)

Automatic evaluation results (2021)

| Site | Total instances (alerts+fails) | Of which number of WCAG Fails |
|-------------------------|--------------------------------|-------------------------------|
| home.cern | 141 | 86 |
| Indico | 35 | 31 |
| CERN Account Management | 133 | 30 |
| IT Department | 23 | 16 |
| ServiceNow | 3 | 1 |

- Benchmark: “[WebAim Million](#)” report 2021: average of **51.4 WCAG Fails** per home page of top million websites worldwide.

Sample types of instances on CERN sites

- **Very low contrast**
 - Sunshine... or impaired sight
- **Layout table**
 - Used to create visual layout eg. person pic + bio
- **Image missing alternative text**
 - “alt” text = descriptive text for audio rendering
- **Device dependent event handler**
 - eg. mouse-only interaction
- **Suspicious link text**
 - “Click here!”, “Read more”
- **Skipped heading level**
 - Navigation issues for screen-readers and keyboard navigation

The conclusion

Web Accessibility at CERN in a nutshell

“It [..] is reasonable to conclude that no policy or support exists at CERN regarding standards, adoption, implementation, evaluation or statement of Web Accessibility.”

(Cath Noble, 2021)

Conclusion after-thought

- **Web accessibility at CERN has had minimal consideration.**
- Despite **legal obligations** about web accessibility in **EU** and **globally**.
- Several contributing factors
 - Low awareness, understanding or knowledge, management commitment..
- The Future
 - Things will improve (see Joachim Yde's presentation)
 - But not going to change overnight
- PS. Read [*Development of Web Accessibility Recommendations for CERN*](#)

