

Web Accessibility for Deaf Users: Current Status and Future Perspectives

Concertation Event EASIER-SignON @ Brussels

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Background



- Associate Professor at the Faculty of Sciences of the University of Lisbon
- Coordinator of the Accessibility and Ageing research line at LASIGE
- QualWeb lead researcher
- LEAD-ME Working Group 1 leader
- Co-chair of the W3C ACT Rules Community Group
- Member of the W3C WAI Curricula Task Force

Agenda



- How web accessibility legislation impacts the accessibility for deaf users
- What is the current level of web accessibility for deaf users
- What are the future perspectives and challenges

Web Accessibility Legislation from the perspective of the Deaf

The Web Content Accessibility Guidelines are the *de facto* standard for web accessibility

- EN 301 549 v3.2.1 maps to WCAG 2.1 Level AA
- Section 508 maps to WCAG 2.0 Level AA

4.2.4 Usage without hearing

Where ICT provides auditory modes of operation, the ICT provides at least one mode of operation that does not require hearing. This is essential for users without hearing and benefits many more users in different situations.

4.2.5 Usage with limited hearing

Where ICT provides auditory modes of operation, the ICT provides enhanced audio features. This is essential for users with limited hearing and benefits many more users in different situations.

EN 301 549 – Functional Performance Statements (3)



Requirements	Usage without hearing	Usage with limited hearing
9.1.1.1 Non-text content	Primary	Secondary
9.1.2.1 Audio-only and video-only (pre-recorded)	Primary	Primary
9.1.2.2 Captions (pre-recorded)	Primary	Primary
9.1.2.4 Captions (live)	Primary	Primary
9.1.3.3 Sensory characteristics	Primary	Primary
9.1.4.2 Audio control	-	Primary
9.2.2.1 Timing adjustable	Primary	Primary
9.2.2.2 Pause, stop, hide	Primary	Primary
9.2.4.6 Headings and labels	Secondary	-
9.3.1.1 Language of page	Secondary	Secondary
9.3.1.2 Language of parts	Secondary	Secondary
9.4.1.3 Status messages	Primary	Primary

Section 508 – Functional Performance Statements



302.4 Without Hearing

Where an audible mode of operation is provided, ICT shall provide at least one mode of operation that does not require user hearing.

302.5 With Limited Hearing

Where an audible mode of operation is provided, ICT shall provide at least one mode of operation that enables users to make use of limited hearing.

Web Accessibility Initiative – Auditory (1)



To use the Web effectively, people with auditory disabilities often rely on:

- Transcripts and captions of audio content, including audio-only content and audio tracks in multimedia;
- Media players that display captions and provide options to adjust the text size and colours of captions;
- Options to stop, pause, and adjust the volume of audio content (independently of the system volume);
- High-quality foreground audio that is clearly distinguishable from any background noise.

For some people with auditory disabilities, sign language is the primary language, and they may not read the written language as fluently [...] However, it is important to remember that not all people with auditory disabilities know sign language.

Web Accessibility Initiative – Auditory (3)



Examples of barriers for people with auditory disabilities

- Audio content, such as videos with voices and sounds, without captions or transcripts.
- Media players that do not display captions and that do not provide volume controls.
- Media players that do not provide options to adjust the text size and colours for captions.
- Web-based services, including web applications, that rely on interaction using voice only.
- Lack of sign language to supplement important information and text that is difficult to read.

Legislation and Guidelines Focus



Primary – Availability of textual alternatives to audio content

Secondary – Interpretability of textual content

Current Status

Where is sign language?



Success Criterion 1.2.6 Sign Language (Prerecorded)

(Level AAA)

Sign language interpretation is provided for all
prerecorded audio content in synchronized media.

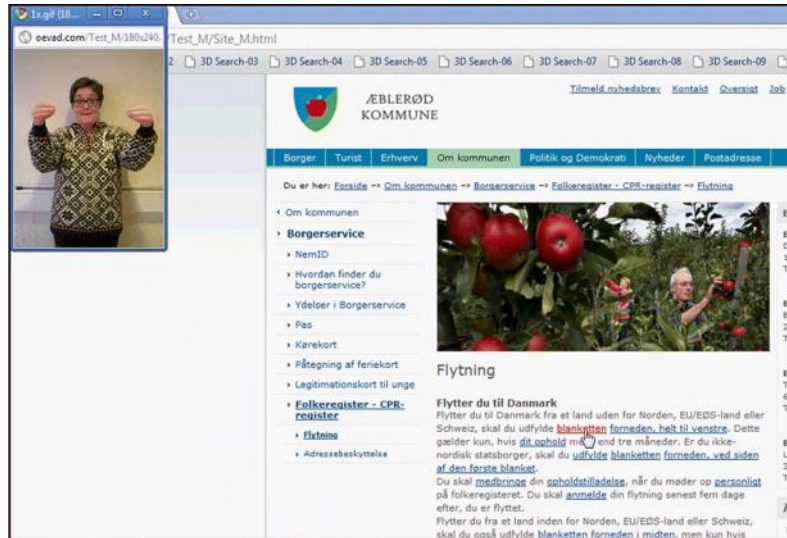
Deaf people have problems navigating on the Internet

- *Jensen, S.S., & Øvad, T. (2016). Optimizing web-accessibility for deaf people and the hearing impaired utilizing a sign language dictionary embedded in a browser. Cognition, Technology & Work, 18, 717-731.*
- *Gutiérrez, M.M., & Cáceres, J.R. (2019). Evaluating the Effectiveness of Accessible web Sites for Deaf users. 2019 International Conference on Inclusive Technologies and Education (CONTIE), 129-1295.*
- *Sousa, C.C., Oliveira, L.M., Rodrigues, C.L., Bulcão-Neto, R.D., & Ferreira, D.J. (2020). Web Accessibility Testing for Deaf: Requirements and Approaches for Automation. 2020 IEEE International Conference on Systems, Man, and Cybernetics (SMC), 2734-2739.*
- *Gutiérrez, M.M., Cáceres, J.R., & Muñoz-Arteaga, J. (2022). Accessibility evaluation for deaf users an approach. 2022 International Conference on Inclusive Technologies and Education (CONTIE), 1-5.*

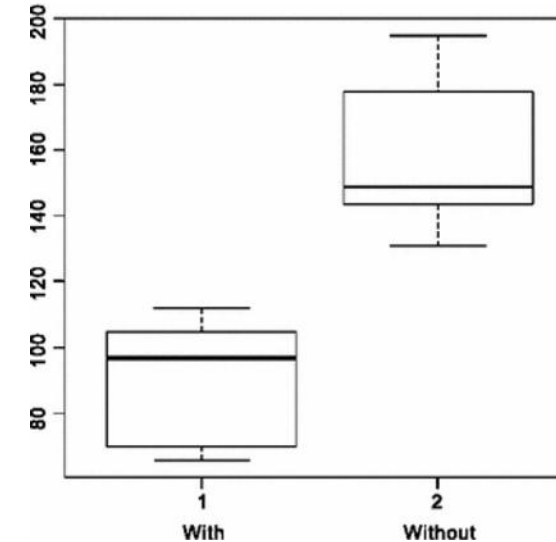
Text alternatives usually result in one the following:

- Degraded task performance due to the difficulty in understanding content that is not available in the user's first language
- Inability to successfully complete tasks when written language is not understood

And with sign language?



Sign language solution, where the hyperlinks activated the animations/translations of the difficult words



Difference in task completion time between the group with the sign language solution, and the group website without the solution

Jensen, S.S., & Øvad, T. (2016). Optimizing web-accessibility for deaf people and the hearing impaired utilizing a sign language dictionary embedded in a browser. *Cognition, Technology & Work*, 18, 717-731.

Future Perspectives


Automated Signing



We need assistive technology for sign language similar to what Braille lines represent for people that can read Braille

Emerging technologies

Sign language must keep up with upcoming developments resulting from the strong progress on AI models

	<p>Various professionals work in the laboratories of the Santa Chiara LAB: makers, developers and designers who research, design and implement human-centered technological solutions. What activities and projects might you be interested in?</p>
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Apuzzo, C., & Burresti, G. (2022). Designing Accessible Chatbots for Deaf People. 2022 11th Mediterranean Conference on Embedded Computing (MECO), 1-4.

Thanks for your attention!

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