



Original research article

E-accessibility for Czech Sign Language users: digital determinants of health

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Abstract

The aim of this study is to identify barriers to e-accessibility, clarify their causes, and use such analysis to propose recommendations for removing or minimizing them so that users of Czech Sign Language (CSL) can fully and effectively use information and communication technologies (ICT) in society and everyday life.

The research was designed as a mixed-methods study. The quantitative part was carried out using a questionnaire survey among the users of CSL, while the qualitative part was carried out in the form of focus groups with CSL users and e-accessibility experts. The data was analyzed with an emphasis on user experience and the evaluation of the accessibility of digital services by the users of CSL themselves.

The findings show that while existing legislative commitments contribute to improving general digital accessibility, the measures do not sufficiently reflect the linguistic and communication specificities of CSL users. Respondents pointed in particular to the limited availability of information and communication in CSL, the predominance of text-based solutions, and the lack of use of existing tools and social services for CSL users in practice.

This study identifies the systemic limits of the current legislation in digital accessibility from the perspective of users of CSL and points to the need for more explicit consideration of these limits in the implementation mechanisms. The findings also define a new research topic focused on the discrepancy between the legislative framework and the real needs of CSL users.

Keywords: Czech Sign Language; Czech Sign Language users; Digital accessibility; European Accessibility Act; Social determinant of health

Introduction

In the current discourse on public health and the digital transformation of society, the idea of digital accessibility – the availability of technology, the internet, digital services, and the skills associated with them – is gaining increasing importance as a social determinant of health (Kim and Backonja, 2025; Richardson et al., 2022).

Throughout the text we use the terms e-accessibility and digital accessibility as synonyms. The concept of digital determinants of health (DDoH) now encompasses not only access to technology, but also digital literacy, infrastructure, cultural and linguistic aspects, user accessibility, and the ability to participate in digital environments at both community and system levels (Rangachari et al., 2025; Richardson et al., 2022).

According to the conceptual “A framework for digital health equity” (Richardson et al., 2022), the key digital determinants of health are: access to technology, digital literacy, infrastructure (internet connectivity, correct hardware), and broader so-

cio-community and systemic conditions that influence whether digital tools actually contribute to improved health.

Health is defined as an individual's interaction with their environment and personal sense of satisfaction with life (Kim and Backonja, 2025).

Factors affecting access equity include socio-economic status, age, digital and health literacy, internet and technology accessibility, as well as cultural and language barriers. These determinants have a major impact on the possibility of equitable access to eHealth services and healthcare.

Deaf and hard-of-hearing people using Czech Sign Language (CSL) represent a linguistic and cultural minority, not just individuals with hearing impairment. National sign languages are fully-fledged natural languages with their own grammar and lexicon; spoken and written languages (e.g., Czech) are often perceived as second languages (European Commission, 2025; Health~Holland, 2025).

In the Czech Republic, 0.5 million people have some form of hearing impairment, of which 7,000–10,000 report using CSL as their primary means of communication (Czech Union of the Deaf, n.d.; European Union of the Deaf, n.d.).

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The proportion of sign language users in the EU and associated countries is typically below 0.2%, with an estimated 87,000 deaf users of BSL in the UK (EFHOH, 2024; RNID, 2022).

Current definitions of the target group are moving away from a purely medical perspective and focusing on the communication needs and preferences of users, which corresponds with international trends in the inclusion of people with hearing impairment. The target group is therefore not defined according to the severity of hearing impairment, but on the basis of individual preference for the predominant communication system. A Czech Sign Language (CSL) user can be a person across the entire spectrum of hearing impairment, including both deaf and hard-of-hearing persons, regardless of the time of onset of their hearing impairment. In accordance with the above operationalization of the term, the text of this paper will consistently use the uniform designation “CSL user” for this target group.

The following empirical studies present the impacts of the lack of e-accessibility, which have specific implications for the health and well-being of people at risk of digital exclusion.

People with disabilities rate eHealth services significantly less accessible than people without disabilities (Pettersson et al., 2023; Rossi, 2023).

Deaf and hard-of-hearing patients in Germany often express dissatisfaction with the healthcare they receive and avoid services due to communication barriers (Rannefeld et al., 2023).

In Wales (UK), healthcare staff often fail to reflect the needs of deaf people. Staff also lack interpretation as well as flexible booking options (Terry et al., 2024).

In Italy, there is a clear urgent need for sign language training for health professionals to prevent the marginalization of deaf patients (Sabato et al., 2024). At the same time, project H SMILE (2025) demonstrates the effectiveness of a hypertension self-management program adapted for sign language users (Kim et al., 2025).

The aforementioned studies show that a lack of e-accessibility can lead to lower health literacy, poorer health outcomes, reduced participation in prevention and treatment, and increased levels of misinformation (Murray et al., 2023).

Properly implemented e-accessibility – including support for sign language, visual communication, appropriate design, and participatory access – can redress structural inequalities (David et al., 2023; Rossi, 2023).

In the context of the European Accessibility Act (Directive /EU/ 2019/882 of the European Parliament..., 2019), it is essential that national and local authorities, as well as technology platforms, ensure real and inclusive access to information and services (Inal and Torkildsby, 2025). This includes video relay services, interpreting, digital accessibility, and the involvement of the deaf community in the design of solutions (European Union of the Deaf, 2025; Health~Holland, 2025).

E-accessibility for sign language users is therefore not just a technical issue, but a key factor affecting health, social inclusion, and equal opportunities (Digital accessibility portal, 2025; European Commission, 2025).

The above conceptual framework provides a professional basis for the research topic and defined objectives. The results presented in the following sections represent a sub-segment of a large-scale project whose central objective was to analyze and systematically describe the barriers to the use of information and communication technologies (ICT) by people with limited access to information. In accordance with the methodology set out in the Accessibility Act, these persons include CSL users.

The main purpose of the research was to identify barriers to e-accessibility, clarify their causes, and use such analysis to propose recommendations for removing or minimizing them so that CSL users can fully and effectively use ICT in society and their daily lives.

Materials and methods

This chapter describes the methodological procedures of the research project, which used a mixed research strategy combining quantitative and qualitative approaches to meet the stated objectives. The research followed a sequential explanatory design, in which the quantitative phase was followed by a qualitative component aimed at achieving a deeper understanding and interpretation of the findings. The two types of data were integrated at the interpretive level, with the focus-group findings supplementing and explaining the results of the questionnaire survey.

The primary aim of the research was to analyze the digital literacy of Czech Sign Language (CSL) users and to identify barriers affecting their access to digital technologies and services. The specific objectives were to determine the subjectively perceived level of digital literacy, assess the accessibility of information and communication technologies, identify barriers to the use of digital services, and analyze the relationship between digital literacy, social interaction, and social participation within this target group. The research also mapped the digital technologies used and assessed their availability, comprehensibility, and degree of integration into the digital environments of public institutions.

The main tool for collecting data was a self-devised questionnaire, created on the basis of qualitative pre-research conducted at the beginning of 2024, on an analysis of independent research, and on the Report on Accessibility of Public Administration and Public Services for Persons with Disabilities in the Czech Republic (Government office of the Czech Republic, 2020). The quantitative part of the research took place in spring 2024, followed by focus groups in September 2024 to refine and supplement the qualitative findings.

The questionnaire contained 30 items, comprising forced-choice identification questions and multiple-choice outcome items, including an open-ended response. The anonymous questionnaire was created in the LimeSurvey environment, and the data was analyzed using descriptive and frequency statistics in IBM SPSS. Responses to open-ended questions were categorized and evaluated in terms of absolute, relative, and cumulative prevalence. The quantitative data were analyzed primarily using descriptive statistics, with the aim of identifying basic trends and patterns in the study population. Given the non-probability sampling and exploratory nature of the research, inferential statistics were not used to generalize the results to the population of CSL users. Analytical depth was enhanced by integrating qualitative data from the focus groups, which made it possible to interpret the relationships among language competence, digital literacy, and the perceived accessibility of digital services. Methodologically, the research was grounded in an interpretive paradigm focused on understanding the meanings and experiences of the participants (Denzin and Lincoln, 2018).

For the target group, videos in Czech Sign Language with translation of instructions, questions and answers were integrated into the questionnaire in accordance with ISO 17100:2015. Due to the mostly closed-ended nature of the questions, it was not necessary to record the answers in the CSL.

In the qualitative part of the research, three focus groups (FG1–FG3) were conducted, each with six participants. FG1 consisted of deaf users of CSL, FG2 of direct practitioners, and FG3 of system-level experts including digital accessibility specialists. The groups were designed to be relatively homogeneous, which encouraged the open sharing of experiences. Each meeting was moderated by a researcher-user of CSL and interpreted into spoken Czech with simultaneous transcription. Discussions were audio-visually recorded, transcribed, and anonymized; all participants signed an informed consent form.

Qualitative data were analyzed using thematic analysis. The focus-group transcripts were read repeatedly and subjected to open coding, during which units of meaning relating to digital literacy, technology accessibility, and barriers to the use of digital services were identified. The individual codes were then grouped into broader categories and thematic areas. Categories were developed iteratively, with emphasis on semantic similarity and recurring patterns in participants' accounts. The resulting themes were subsequently compared with the quantitative findings, thereby integrating the two data strands and enabling a deeper interpretation of the results.

Description of the research population

The target group of the research were people with hearing impairment who use or prefer Czech Sign Language as their main means of communication. The question on communication preference was included in order to clarify the language background of the respondents. The data shows that 48.9% of respondents prefer CSL, 42.1% report full communication in both CSL and Czech, and 6.8% prefer Czech exclusively. This proportion of respondents was not included in further data analysis. Information on hearing status and technical aids was not crucial to the analysis, as the research focused on communication needs, not on the medical aspects of the disability.

The respondents were selected by non-probability purposive sampling with self-selection through organizations and social networks. Participation in the focus groups was also voluntary; the criterion was the status of the CSL user or an expert in the relevant field.

The research sample ($N = 133$) consisted mainly of respondents aged 26–45, more often women, and people from small villages and large cities. In terms of education, a secondary education with a high school diploma or an apprenticeship certificate predominated, which corresponds to the heterogeneous structure of the population surveyed.

Limitations of the research

Despite the attempt to be as objective as possible, it is necessary to reflect on the limitations of the research. The research sample of 133 respondents represents approximately 1.8–2.7% of the estimated population of CSL users in the Czech Republic, which does not allow for full statistical representativeness. A confidence level of 95% allows the consideration of a confidence interval of $\pm 8.5\%$. The results are therefore particularly suitable for identifying trends and structural problems. Representativeness may have been affected by non-probability sampling, online data collection, and the self-selection effect, favoring respondents with higher digital competence. The self-assessment nature of the questionnaire and the potential influence of group dynamics in the focus groups are also limitations.

The conclusions should therefore be understood as contextually conditioned, with a contribution mainly at the analytical and explanatory level.

Results

Digital competencies and the language barrier

The results show that CSL users do not perceive the technical operation of digital technologies itself as the main problem; rather, the principal difficulty lies in understanding linguistically demanding content written in Czech. Most respondents rated their skills in using ICT devices as good or very good (65.4% of valid responses), and their ability to search for information online was assessed similarly positively. Approximately one-third of respondents reported that they were always or almost always successful when searching for information.

However, the quantitative findings contrast with the qualitative data, which reveal a marked difference between the ability to locate information technically and the ability to understand its meaning. Participants in focus group FG1 repeatedly reported that they could manage the technical aspects of digital technologies without major difficulty, but encountered problems when interpreting written content, particularly where it contained specialist wording or lacked visual support. In this context, respondents distinguished between 'finding information' and actually grasping its meaning, as illustrated by the following statement: "I can read information on a website, but I do not understand many of the words and I am not exactly sure what I am supposed to do."

A similar interpretive pattern emerged in focus group FG2. Practitioners reported that their clients generally managed the technical operation of devices and basic navigation of the digital environment, but experienced difficulties when working with linguistically complex content. The findings therefore suggest that this group's digital difficulties are not primarily attributable to low technical literacy, but are chiefly associated with understanding written Czech.

This problem is particularly evident when working with official and administrative texts. Only a small proportion of respondents reported fully understanding the sample official text, whereas approximately one-third reported only partial understanding. The focus groups associated these difficulties primarily with the linguistic complexity of the texts, long sentences, and unclear specification of the action required. Respondents repeatedly stated that, even after repeated reading, they remained uncertain about the correct interpretation of the message.

Difficulties arise not only in comprehension but also in producing formal written texts. Almost one-quarter of respondents described writing a formal letter independently as difficult. Participants in focus group FG1 characterized this task as time-consuming and associated with uncertainty about the accuracy and comprehensibility of the resulting text. The findings therefore demonstrate a close interrelationship between digital literacy and functional literacy in written Czech.

Accessibility of digital services and the role of language

Assessments of the accessibility of digital services varied substantially according to the type of service and the manner in which content was presented. Services with a predictable structure and strong visual support, such as online shops, online banking, and mobile applications, were rated relatively positively. By contrast, institutional digital services, particularly the websites of public institutions, were often perceived as difficult to use.

The findings suggest that perceived accessibility is primarily related to the linguistic and communicative demands of the content. Long texts, complex forms, and the absence of visual

support were particularly problematic. The qualitative data repeatedly indicated that the main source of difficulty was not the technical complexity of the interface, but the way in which the content was linguistically designed and presented.

An important factor enabling the independent use of digital services was the possibility of completing matters entirely online without the need for telephone communication. Respondents perceived telephone contact as a major barrier to autonomy, whereas systems allowing online bookings, appointment selection, or text-based communication were described as functional and accessible.

Although free online Czech Sign Language interpreting services are available in the Czech Republic, they are not universally used. Approximately one-third of respondents reported using one of these services, while the others were unaware of them, did not use them, or did not consider them suitable for their needs. The qualitative data show that the mere availability of a service does not ensure its use. Respondents frequently reported uncertainty regarding the conditions of use, operating hours, or expected waiting times.

In specific communication situations, such as contact with public authorities or healthcare facilities, respondents therefore often relied on support from family members and other close persons, even where professional interpreting services could have been used. The findings thus indicate a continuing dependence on informal support and limited institutional integration of accessible communication mechanisms.

Digital participation and social engagement

The results show that, although the digital environment expands opportunities for access to information and social participation, it simultaneously reproduces language barriers present in the offline environment. Respondents repeatedly reported that their access to current information was delayed and less comprehensive than that of the hearing population. An important factor is that a substantial proportion of audiovisual content in the digital environment is available primarily in spoken Czech and is not systematically provided with captions or CSL interpreting.

The data also show that the level of understanding of digital content depends on the type of message and the way it is presented. For practical videos with clear visual demonstrations, captions were often considered sufficient, particularly where the image conveyed the principal meaning. This conclusion is also supported by the quantitative data: 30.8% of respondents reported that captions for informational videos were sufficient for a good understanding of the content, while for 24.1%, comprehension depended on the specific subject matter of the video.

By contrast, for more complex topics, such as news or public information, respondents considered captions or a text transcript alone insufficient. In these situations, full understanding was associated primarily with interpreting into Czech Sign Language. The findings therefore suggest that the accessibility of audiovisual content cannot be reduced merely to the presence of captions; it also depends on linguistic comprehensibility and the manner in which information is conveyed.

Despite gradual improvements in the availability of digital information, access to many communications continues to be mediated by other people, particularly family members or members of the community. This pattern is also confirmed by the quantitative data, which show that informal support is used more frequently than institutional forms of assistance when digital and operational difficulties arise.

Structural barriers to the digital inclusion

The findings do not indicate major problems with access to digital technologies themselves or their basic operation. More substantial barriers arise at the level of systemic support and the way digital services and information resources are designed.

Respondents repeatedly pointed to the absence of courses, educational materials, and instructional resources in Czech Sign Language. Video tutorials and educational materials with Czech captions that would support the development of more advanced digital skills are also lacking. As a result, digital skills are often acquired informally through family and acquaintances. This pattern is also confirmed by the quantitative data, according to which 76% of respondents turn primarily to people close to them when dealing with digital problems.

In relation to access to digital technologies, the affordability of devices was not identified as the main problem, because smartphones and laptops may be provided as partially reimbursed assistive devices. However, the qualitative data point to inconsistent decision-making practices in the allocation of these devices. Respondents and experts noted that parameters important for visual communication, such as webcam quality or the data capacity required for video calls, are not systematically taken into account.

With regard to the digital environment itself, the barriers lie primarily in the way digital services are designed. Accessibility is often understood primarily as a matter of technical or sensory accessibility, while the linguistic dimension remains in the background. The findings suggest that written Czech is implicitly regarded as a universal and sufficient means of communication in the digital environment, even though it constitutes a language barrier for a section of CSL users.

At the same time, Czech Sign Language is not always recognized in the public sphere as a fully-fledged natural language with its own specific grammatical structure. The accessibility of digital services is therefore often reduced to formal technical measures, while the communicative and linguistic dimensions remain systemically neglected.

Use of digital assistive technologies and services

Online Czech Sign Language interpreting is used primarily in situations requiring rapid or flexible communication, such as contact with public authorities or healthcare facilities, or when dealing with time-sensitive matters. Users who actively used the service rated it predominantly positively and described its importance for independent functioning in everyday life.

At the same time, however, the existence of a service does not automatically lead to its widespread use. Approximately one-third of respondents use an online interpreting or transcription service, with 18.8% of those surveyed using online CSL interpreting. The findings indicate limited awareness of the availability of these services and their insufficient integration into the routine communication processes of public institutions.

Institutions often do not anticipate the use of online interpreting as a standard component of communication and do not actively offer this option. Respondents also described situations in which communication through an online interpreting service was not accepted by the institution at all, for example in certain banking services.

Automatic speech-to-text transcription was used by only a small proportion of respondents (11.3% of valid responses). This tool was considered suitable primarily for brief, situational forms of communication, but not for conveying complex content or specialist explanations.

When watching live streams, conferences, and other online events, respondents clearly preferred Czech Sign Language interpreting, or a combination of interpreting and simultaneous transcription. Simultaneous transcription was used primarily to identify names, specialist terms, or numerical data, whereas overall understanding of the content was associated mainly with CSL interpreting. This pattern is also confirmed by the quantitative data: 24.8% of respondents preferred CSL interpreting and 21.8% preferred a combination of both services, while only 6.0% selected simultaneous transcription alone.

Discussion

The results of the research show that digital accessibility, as currently defined by the European Accessibility Act (EAA) and related legislation, only partially reflects the specific needs of users of Czech Sign Language (W3C, 2024). The empirical data suggest that the technical and sensory accessibility of digital services alone does not ensure their functional accessibility. The key issue is not primarily the technical operation of digital interfaces, but the comprehensibility of the content and the way in which it is linguistically conveyed. The study findings therefore confirm the need to understand the accessibility of the digital environment not only as a technical issue, but also as a linguistic and communication issue.

This conclusion is in line with international studies and the findings of a report on the state of implementation of the European Accessibility Act published by the European Union of the Deaf (2025). A number of authors have highlighted the distinction between formal compliance with accessibility standards and the actual usability of digital services for sign language users. Compliance with technical accessibility criteria does not automatically guarantee that content is comprehensible or usable in practice (Fuentes-Cortázar et al., 2024; Inal and Torkildsby, 2025). Studies focusing on the digital inclusion of deaf users and their experiences with public digital services similarly emphasize the linguistic dimension of accessibility (De Meulder, 2025; Rogers et al., 2024).

Self-assessment by respondents shows a relatively high level of technical digital skills, especially in operating ICT devices and searching for information. At the same time, however, the qualitative data point to substantial difficulties in understanding written Czech and producing formal written texts. Respondents repeatedly distinguished between the ability to locate information technically and the ability to understand its meaning. These findings are consistent with the literature, which has long emphasized that, for many CSL users, written Czech is a language distinct from their primary communication system (Komorná, 2018; Napier, 2021; Pohl et al., 2023). Difficulties in understanding official texts, forms, or instructions should therefore not be interpreted as a deficit in digital competence, but rather as a consequence of a language barrier within an environment based predominantly on written text.

The findings also show that the digital literacy of CSL users cannot be separated from functional literacy in written Czech. This relationship is also reflected in the European Digital Competence Framework, DigComp 2.2, which conceptualizes digital competence as closely interconnected with information comprehension, reading literacy, and the ability to engage critically with content (Vuorikari et al., 2022). Without consideration of the linguistic dimension, the concept of digital literacy for this group therefore remains incomplete.

Respondents regarded digital services with a clear structure, visual support, and intuitive interfaces, such as online

shops or banking applications, as relatively accessible. By contrast, they described institutional digital services based on complex texts and forms as problematic. Similar findings have been reported in international studies of the accessibility of public digital services for deaf users, which emphasize the importance of comprehensible language, multimodal communication, and visual support for information (Fuentes-Cortázar et al., 2024; Inal and Torkildsby, 2025). The findings of the present study suggest that, in the Czech context, accessibility is still often reduced to the availability of written text, even though written Czech may not constitute a fully functional means of communication for CSL users.

A further fundamental problem is the persistent lack of recognition of Czech Sign Language as a fully-fledged natural language with its own specific grammatical structure (Stone et al., 2022). Consequently, the linguistic and communicative dimensions of accessibility in the digital environment are overlooked and are not systematically incorporated into the design of digital services or methodological guidance for public institutions. This approach subsequently gives rise to the implicit assumption that compliance with technical requirements automatically ensures the functional accessibility of services.

The findings further show that the mere existence of online interpreting services does not automatically result in their use. Although these services are available free of charge in the Czech Republic, some respondents are unaware of them or uncertain about the situations in which they may be used. Their systematic integration into the communication processes of public institutions is also lacking. Institutions often do not anticipate the use of interpreting services as a standard component of communication and do not actively draw attention to this option. Responsibility for ensuring accessible communication therefore remains largely with CSL users themselves, who consequently often rely on assistance from family members or other close persons.

International practice shows that systematic methodological guidance can make a substantial contribution to integrating sign language into public communication. In the United Kingdom, for example, the Government Communications Service has issued guidance on the active use of British Sign Language (BSL) in the public sector (UK Government Communications Service, 2025). Comparable methodological guidance is not yet available in the Czech context.

The research also highlights the risks associated with the uncritical use of technological solutions, particularly automated tools for converting text into sign language. These technologies are often developed predominantly from a technological perspective, without adequate verification of their comprehensibility, safety, and usability in real-world communication contexts. International studies have repeatedly highlighted the absence of uniform standards, limited validation, and insufficient involvement of sign language users themselves in the development of these tools (Berrezueta-Guzman et al., 2025; Glasser, 2025; Venade, 2025; Zante et al., 2024).

The difficulties of CSL users in the digital environment cannot be interpreted as a consequence of low digital literacy or lack of access to technology. The empirical data clearly shows that the core of the problem lies in the structure of the digital environment, which systematically assumes a high level of understanding of written Czech but does not reflect the linguistic reality of the users of CSL. This is therefore a broader structural problem manifested at the levels of legislation, methodology, institutional practice, and the research framing of the topic.

The study findings contribute to the scholarly discussion concerning the need to move away from a predominantly technically oriented conception of accessibility toward an approach that also takes into account language, communication, and the actual usability of digital services. They also indicate that, although the European Accessibility Act represents a significant step towards strengthening digital inclusion, its practical implementation encounters limitations, particularly in relation to the needs of Czech Sign Language users. The data obtained therefore create scope for further research into how digital environments and digital services should be designed so that they are genuinely functionally accessible to CSL users.

Based on the results of the research, the following recommendations for best practices can be formulated:

- Create state-guaranteed methodological recommendations for the accessibility of the digital environment for Czech Sign Language users, which go beyond EAA requirements.
- Ensure the development of these methodologies in a multidisciplinary team, including experts in Czech Sign Language, accessibility, UX, and service design.
- Introduce systematic testing of digital services with users of CSL at the design stage.
- Support systematic education about available communication services towards users and institutions.
- Ensure long-term data collection and regular evaluation of the needs of CSL users.
- Set clear quality and competence criteria for suppliers of accessible solutions.
- Identify a clear institutional focal point responsible for coordination and methodological guidance in digital accessibility for users of CSL.

Conclusion

The results of the research consistently confirm that the functional accessibility of the digital environment for users of Czech Sign Language cannot be reduced to the mere fulfilment of technical requirements. At the heart of accessibility is the actual clarity and usability of information in specific user situations. The concept of e-accessibility, which in practice is often viewed primarily through the prism of the European Accessibility Act (EAA) and related technical standards, can thus lead to formally compliant but factually dysfunctional solutions if the linguistic and communication needs of the users of the CSL are not systematically considered. Although the EAA is not the only legislative framework related to accessibility, in the Czech environment it is often seen as the main – and in some cases the only – reference point for assessing digital accessibility.

The next step should be the methodically driven design of digital services that works with the multi-layered delivery of information and which purposefully links different forms of communication. The goal is not to create a digital environment based solely on Czech Sign Language, but rather to create a combination of languages, media, and user interfaces that meets the needs of CSL users and minimizes barriers at the interface of content and interaction. In this sense, e-accessibility must be understood as an interdisciplinary commitment that, in addition to technical correctness, requires a responsible grasp of communication, context, and user experience; otherwise accessibility remains only declarative, not functional.

Authors' consent to publication

The authors hereby confirm that the submitted manuscript is an original work, has not previously been published, and is

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Ethical aspects and conflict of interest

The authors have no conflict of interest to declare.

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