ONLINE ACCESSIBILITY OF PUBLIC INSTITUTIONS FOR PEOPLE WITH DISABILITIES

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Abstract: Accessibility to public online space is a right of all citizens and plays an important role in promoting democracy and institutional transparency. People with disabilities continue to face challenges in accessing public information, either due to inappropriate functionality or failure to meet European Union standards, which can significantly limit the exercise of this right. This research aims to analyze the relevant legislative framework alongside international accessibility standards, followed by a practical evaluation of the accessibility level of Romanian public institutions according to WCAG 2.1 and the automated verification tools provided by this standard. The results will provide an up-to-date overview of the current level of digital accessibility, focusing on the technical development of online platforms, thus ensuring the social inclusion of people with disabilities.

Keywords: digital accessibility, social inclusion, WCAG standards, institutional transparency

1. Introduction

The internet and information technology (IT) have had a major social and economic impact in recent decades. Beyond the economic dimension, IT plays an essential role in addressing social challenges: students can access valuable educational resources, rural communities benefit from medical services through telemedicine, and public administrations become more efficient and transparent. In this context, it is essential that technology is designed to be inclusive and accessible to people with disabilities, thus contributing to their increased independence and integration into the labour market.

The digital divide is most often understood as the gap between those who have access to information technology and those who do not. However, people with disabilities are often a minority group excluded from access to the World Wide Web, even if they have a computer (Kreps, 2008).

A key initiative in this regard is the Web Accessibility Initiative (WAI), launched in 1997 by the World Wide Web Consortium (W3C), which promotes technological accessibility and equality in the use of the Internet (Paciello, 2000).

The task of ensuring Internet accessibility for people with disabilities is formulated in the documents of the W3C consortium in the form of the WAI (Web Accessibility Initiative) recommendations and the WCAG - Web Content Accessibility Guidelines (Polilova, 2024).

WAI aims to ensure equal access to the Web for all users and focuses on five directions: technology, guidelines, tools, education and research.

2. Contextual landmarks for online accessibility

The World Wide Web is seen as a universal platform where anyone can publish and access information, but in reality, many users - especially people with disabilities - face significant barriers. Web accessibility is more than compliance with a legal standard - it is a necessary condition for all users, including those with visual, auditory, motor or cognitive impairments, to have an equal digital experience (Sohaib & Kang, 2016).

The Web Content Accessibility Guidelines (WCAG), developed by the W3C, provide clear recommendations for creating accessible websites. However, in practice, many web developers have limited knowledge in this area and the integration of these standards remains superficial. This is often due to a lack of training and awareness (Paciello, 2000).

With the growth of electronic services, the evaluation of accessibility has become crucial. Effective access for people with disabilities can mean the ability to access vital services, products and information that would otherwise be difficult to obtain. For example, access to media files and documents is a major barrier, particularly for users with visual impairments who rely on assistive technologies such as screen readers (Alahmadi & Drew, 2017).

Web accessibility for these vulnerable groups depends on the extent to which digital barriers are removed, such as the lack of alternative text for images, hard-to-read fonts or problematic colour schemes. The ultimate goal is to create a web that is accessible to all people with disabilities (Paciello, 2000).

A recent international study shows that people with visual and cognitive disabilities have difficulty processing information when websites do not adhere to principles of simplicity and consistency in design (Gartland et al., 2022).

There are four main methods of evaluating web accessibility:

- automated evaluation, using tools such as WAVE, A Checker or those compliant with WCAG 2.1, which automatically detect accessibility errors.
- manual evaluation, carried out by experts, which can identify more subtle issues, but is more costly and time-consuming.
- user testing with people with disabilities, the most accurate method, but difficult to implement on a large scale.
- hybrid approach, combining automated and manual methods to provide a complete picture.

Despite their importance, research shows that there is no standardised system for comparing the performance of these accessibility evaluators (Alsaeedi, 2020).
For people with disabilities, access to the Internet is sometimes more important than physical presence, providing access to resources that would otherwise be inaccessible. However, the lack of proper implementation of standards leads to digital exclusion. Studies show that public institutions and web developers must take responsibility for actively implementing the WCAG standards - not only to meet the legal obligations imposed by EU Directive 2016/2102, but also to guarantee a fundamental right to information (Sabev, Georgieva-Tsaneva & Bogdanova, 2020).

3. The role of legislation in ensuring the legal framework for accessibility

A well-structured legal framework is a fundamental condition for ensuring equal access to digital information and services for all categories of users, especially for people with disabilities. In this context, the main objective of Directive (EU) 2016/2102 is to ensure the accessibility of websites and mobile applications of public institutions. It requires member states to ensure that digital services are perceivable, operable, understandable and robust, and compatible with assistive technologies such as screen readers or voice commands (European Parliament & Council of the European Union, 2016).

The accessibility of public administration websites is a key quality indicator for the successful implementation of the information society (Pribeanu, Marinescu, Fogarassy-Neszly, & Gheorghe-Moisii, 2012).

This directive aims to harmonise national rules, reduce implementation costs, stimulate innovation and, most importantly, improve digital inclusion. Its specific requirements include the publication of accessibility statements by institutions, the provision of feedback to users, and participation in an ongoing monitoring and periodic reporting process. In certain cases, justified exceptions are allowed, but only within clearly defined limits. In this way, the Directive supports the creation of a fair digital European space accessible to all citizens.

In Romania, the transposition of the Directive has been achieved through the Emergency Ordinance no. 112/2018, which clearly defines the obligations in the field of digital accessibility. According to this ordinance, the responsibility lies with public sector bodies, including central and local authorities, public law institutions and associations formed by such bodies. The aim is for people with disabilities to be able to access and use these digital platforms effectively, regardless of their limitations, with the help of assistive technologies.

In practice, many people with disabilities face great difficulties in using the Internet, and everyday activities such as reading information, filling in forms or purchasing services become inaccessible on websites that do not provide text alternatives, image descriptions or support for assistive technologies. The impact is particularly felt by people who are blind or have hearing, motor or speech impairments. However, it has been observed that accessibility has not been considered in the development of these websites (Mancebo & Herrero, 2024).

Web Content Accessibility Guidelines (WCAG) and the Section 508 standard provide developers with a solid foundation for identifying and resolving accessibility issues. These standards are valuable because they encourage the prioritisation of changes based on feedback from users with disabilities, allowing digital platforms to be more effectively adapted to their real needs. They also support the selection of assessment tools, educational resources, and decisions about technical implementation (Alahmadi & Drew, 2017).

4. Design of methodology

Despite the existence of clear web accessibility standards, research shows that most websites, including those of universities and public institutions, do not provide adequate access for people with disabilities, especially those with visual impairments. Several international studies (e.g. USA, Turkey) have found a lack of compliance with accessibility recommendations, with the most common omissions being the lack of

alternative text for images and difficult navigation. To address these identified issues, the Web Content Accessibility Guidelines (WCAG) 2.1 standard developed by the World Wide Web Consortium (W3C) provides a robust and technology-neutral framework for creating accessible content (Sabev, Georgieva-Tsaneva & Bogdanova, 2020).

The method used in the research design is document analysis, which involved examining and interpreting relevant theoretical sources such as academic articles, laws, regulations, standards and monitoring reports in order to understand and evaluate how web accessibility for people with disabilities is regulated and applied.

This theoretical component was complemented by a practical verification, carried out using the free online automated verification tool provided by the Skynet Technologies platform (https://www.skynettechnologies.com/accessibility-checker).

Given the objectives of the present research, out of a total of 843 websites of public institutions identified by the Romanian Authority for Digitalisation (ADR) according to the 2024 monitoring report, 50 websites were selected as relevant and representative at the national level. These were considered significant due to their role in central administration, social services, education, transport, tourism, etc. (Romanian Authority for Digitalisation, Information Society Service, 2024).

The evaluation of the accessibility of the selected websites took place between March and April 2025. The tool used, Accessibility Checker, automatically analysed the compliance of the websites with international standards such as WCAG 2.1, ADA and EN 301 549, and generated detailed reports on the main accessibility issues identified.

Based on this theoretical and applied methodology, three working hypotheses were formulated:
- Hypothesis 1 - Is automated evaluation sufficient for a comprehensive analysis of the compliance of institutional websites?
- Hypothesis 2 - Do technical deficiencies primarily affect users with visual and cognitive disabilities?
- Hypothesis 3 - Is the average level of compliance of public websites at least 50%?

5. Research results

Regarding Hypothesis 1, the data collected indicates significant limitations of automated assessment. In many cases, the tool used indicated the impossibility of performing an exclusively automated evaluation with messages such as "almost everything requires manual review" or "all sections marked for manual review". These observations indicate either poor accessibility optimisation or the use of outdated technologies and HTML code.

The most common issues identified were incorrect heading structure, insufficient contrast between elements and a lack of alternative text for images. These issues clearly indicate a lack of adherence to web development best practices. Notably, over 40% of the errors identified required manual review, confirming that automated testing provides only a preliminary overview and is not sufficient for a full assessment of WCAG 2.1 compliance. Automated accessibility testing tools only detect some of the problems, and the most critical sections are often flagged as requiring manual review - limiting the accuracy of the assessments in the absence of human intervention.

Regarding Hypothesis 2 – Technical deficiencies primarily affect people with visual and cognitive disabilities, the analyzed data confirm this assumption.

The reports generated by the testing tool frequently indicate errors such as poor heading structure, missing alternative text for images, low contrast, and inaccessible forms, all of which have a major impact on users with visual and cognitive disabilities:
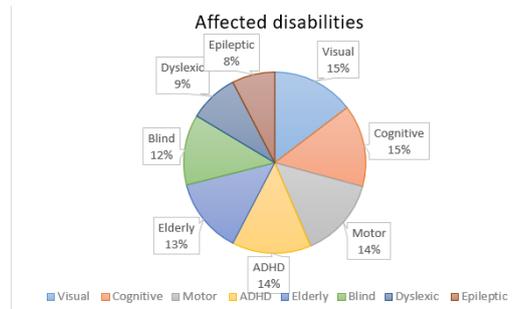

Figure 1. Types of disabilities affected

Source: generated by the authors

These two types of disability are the most frequently mentioned and are consistently targeted by the majority of websites analysed. Although other types of disability are also mentioned, such as motor impairments, ADHD, dyslexia, epilepsy or challenges faced by elderly users, the impact is more pronounced for people with visual and cognitive impairments. The frequent presence of the combination "visual, cognitive, blind, ADHD, elderly, motor" indicates a high level of multiple impairments. However, the pattern clearly highlights the lack of a user-centred universal design approach.

Regarding Hypothesis 3 - The average level of compliance of public web sites is below 50%, the data obtained does not support this assumption. The evaluation of 50 websites belonging to public institutions in Romania showed that only 7 of them scored above 60% in terms of accessibility, while the overall average score was only 42.56%.

The remaining 43 sites (86%) fell below the 60% threshold, and a large proportion of them - around 70% - were classified as 'non-compliant', with scores below 50%.

The majority of digital platforms of public institutions in Romania do not meet the minimum requirements of the WCAG 2.1 standard, resulting in a generally low level of digital accessibility. Most of the digital platforms evaluated (70%) were classified as "not compliant", with scores below 50%, indicating a low level of compliance with the WCAG 2.1 standard:

Figure 2. Degree of compliance of major public institutions in the online environment in Romania

Source: generated by the authors

These results confirm a generally low level of compliance with WCAG 2.1 standards, reflecting a significant lack of alignment with the minimum requirements for digital accessibility in the public sector. Thus, the hypothesis that the average would exceed 50% is rejected, and the clear conclusion is that digital accessibility within the Romanian public administration remains insufficient, with direct implications for the inclusion of people with disabilities:
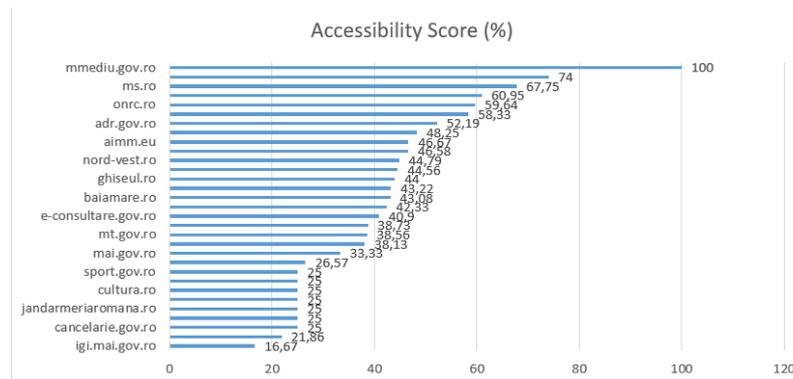

Figure 3. Importance of professional experience in the use of modern methods

Source: generated by the authors

A total of 50 websites belonging to public institutions in Romania were assessed and the results show that only 7 websites achieved an accessibility score of over 60%, the highest being 100% (mmediu.gov.ro). The remaining 43 sites - representing 86% - fell below the 60% threshold, with more than half scoring below 50%, indicating a generally low level of compliance with the WCAG standards.

The web's graphical user interface (GUI) is a significant challenge for many users with disabilities. Blind people find it difficult to navigate and interpret content due to a lack of compatibility with assistive technologies. Deaf users cannot access audio content without captions or transcripts, and people with motor disabilities or repetitive movements often find the interface difficult to use. In addition, voice command-based technologies may exclude people with speech or hearing impairments (Paciello, 2000).

According to the research conducted, the most commonly identified accessibility issues disproportionately affect users with visual, cognitive and motor disabilities. Issues such as insufficient contrast, lack of alternative text, poor headline structure and inaccessible forms significantly limit these user groups' access to essential public information.

Hypothesis 1 addressed the sufficiency of automated assessment for comprehensive compliance analysis. The results showed that automated testing tools only identify a subset of the actual problems. While automated tools can quickly detect a wide range of technical errors, they cannot adequately assess essential aspects such as content readability, language clarity or navigation efficiency for users with disabilities.

The study by Pribeanu et al. (2012) analysed 60 municipal websites in Romania and highlighted that although automated assessment provided a useful initial overview, the large variation in errors and the lack of recurrent testing showed that automated checks alone are not sufficient. They need to be complemented by manual testing and the

involvement of users with disabilities to identify real usability problems that algorithms cannot detect.

In the current research, in over 40% of cases, sections requiring manual testing were marked with messages such as "almost everything requires manual testing", confirming the need for a hybrid evaluation approach that combines automated tools with human expertise.

Hypothesis 2 examined the impact of technical deficiencies on users with visual, cognitive and motor disabilities. This hypothesis was confirmed as the most common errors - such as low contrast, lack of alternative text, disorganised headings or inaccessible forms - primarily affect these user groups.

Technical accessibility deficiencies directly and significantly affect users with visual and cognitive disabilities, highlighting the need for strict implementation of the WCAG standards. This indicates the absence of a universal design approach - one that would integrate the needs of users with disabilities from the very beginning of the development process.

Hypothesis 3 assumed that the overall level of WCAG 2.1 compliance in the public sector is low. The results support this hypothesis: only 2% of the sites analysed (1 out of 50) can be considered fully compliant, 28% are partially compliant and 70% are non-compliant, scoring below the 50% limit.

6. Conclusions

We set out to research this issue because we believe that equal access to information - especially in the digital environment - is a fundamental right that must be guaranteed to all citizens, regardless of ability. In an increasingly digital society, it is vital that online public services are designed and implemented in an inclusive way.

People with disabilities face real, daily challenges when accessing public information or using institutional platforms, and this reality motivated us to investigate the extent to which public institutions in Romania comply with WCAG 2.1 standards. We saw this research not only as an academic opportunity, but also as a moral responsibility.

The research was structured around three working hypotheses aimed at assessing the level of web accessibility in the Romanian public sector and identifying the main dysfunctions in this area.

According to the literature, automated evaluation is not sufficient for a comprehensive analysis of accessibility compliance. This reality reflects the lack of systematic implementation of accessibility standards and highlights an increased risk of digital exclusion for people with disabilities. Access to public information is a fundamental right that must be guaranteed to all citizens, regardless of ability.

The research findings highlight the need for concrete and urgent interventions:
- training of IT teams in public institutions on WCAG standards;
- development and adoption of clear audit tools,
- complemented by manual evaluations;
- establishment of stricter compliance policies and mechanisms.

Overall, the research underlines not only the existing technical shortcomings, but also the lack of a coherent digital inclusion strategy in the Romanian public sector.

Through this study, we aimed not only to highlight the dysfunctions of the current system, but also to provide a real basis for reflection and action for public authorities, web developers and all those involved in building an inclusive digital society.

The choice of this topic reflects our desire to contribute, through concrete results, to the improvement of practices within the public sector and to give visibility to an issue that is often overlooked. We wanted to combine the theoretical analysis of legislation with a practical evaluation of public web sites, in order to provide a comprehensive view of the current situation and to highlight the need for specific interventions to build an accessible and inclusive public web.

As with any scientific endeavour, our research faced certain limitations and constraints. Firstly, the accessibility assessment relied on automated testing using an online tool, which did not allow for the identification of all functional issues.

Based on the conclusions drawn, we believe that future research could deepen the analysis by comparing accessibility levels between Romania and other countries, as well as extending the research to mobile applications, which are widely used and developed by public institutions.

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