# WEB ACCESSIBILITY IN THE FIELD OF SOCIAL SERVICES AND BENEFITS IN ROMANIA

**ANCA MONICA MARIN**
**LILIANA POPA**

*This paper examines the current situation in Romania in terms of web accessibility provided by two key institutions in the field of administering social services and benefits in Romania – County Directorates of Social Work and Child Protection (DGASPC) as well as County Pensions Houses (CJP). As the pandemic context further accelerated the development of e-government worldwide, there is a strong need to ensure information and communication accessibility for persons with disabilities and persons with functional limitations in general. The assessment grid is represented by the Web Content Accessibility Guidelines (WCAG) 2.1 requirements and techniques, mainly regarding Level A, minimum level of conformance. Results underline significant discrepancies in implementing various accessibility characteristics among similar institutional bodies and the needs to take further steps to improve accessibility. The study adds knowledge on the larger topic of digital inclusion, as a contributor to enhanced social inclusion. It also contributes to the international debate on web accessibility evaluation and developing accessibility in web design, especially in the case of public authorities who have under their responsibility services directly addressed to persons with disabilities or to older persons with visual or hearing impairments.*

***Keywords:*** *web accessibility; Romania; social services; digital inclusion; persons with disabilities; persons with functional impairments.*

## INTRODUCTION

Web Accessibility represents an integral part of both e-government development and of the fundamental rights provisioned in the Convention of the Rights of Persons with Disabilities (CRPD). It is included in the general principle of enabling accessibility to support persons with disabilities to live independently in the community. Article 9 of the CRPD stipulates that "to enable persons with disabilities to live independently and participate fully in all aspects of life, States Parties shall take appropriate measures to ensure to persons with disabilities access,

**Address of the corresponding authors: Anca Monica MARIN** Research Institute for Quality of Life, Bucharest, Romania, e-mail: monicatoba@hotmail.com, monica.marin@iccv.ro (https://orcid.org/0000-0002-5064-9137); Liliana POPA, Faculty of Automatic, Computer Science and Electronics, University of Craiova, Romania, e-mail: liliana.popa@edu.ucv.ro (https://orcid.org/0000-0001-6950-4846).

on an equal basis with others, to the physical environment, to transportation, to information and communications, including information and communications technologies and systems, and to other facilities and services open or provided to the public, both in urban and in rural areas. These measures, which shall include the identification and elimination of obstacles and barriers to accessibility, shall apply to, inter alia: a) Buildings, roads, transportation, and other indoor and outdoor facilities, including schools, housing, medical facilities, and workplaces; b) Information, communications, and other services, including electronic services and emergency services" (UN Convention of the Rights of Persons with Disabilities 2006). This principle has been transposed in international and national legislation, and complex monitoring systems have been developed to operationalize and enhance its implementation.

At the EU level, the Web Accessibility Directive (Directive (EU) 2016/2102) has been in force since 22 December 2016, and aims to improve access to websites and mobile apps of public services for persons with disabilities. According to another decision on implementation (Implementing Decision (EU) 2018/1523), a detailed, comprehensive, and clear accessibility statement on how their websites and mobile applications comply with this directive, including:

- an explanation for any inaccessible elements and information on accessible alternatives;
- a description of how a user may report any failure to comply with this directive or request information that is excluded from the scope of this directive;
- a link to a complaint mechanism that can be used if the response is inadequate (Directive (EU) 2016/2102, 2021).

At the national level, Romania set a target under this issue even since 2007: "By December 31, 2008, public authorities need to take measures to a) make accessible their web pages, to improve access of electronic documents by persons with visual and mental impairments" (Law no. 448/2006 on protection and promotion of the rights of persons with disabilities).

This paper examines the current situation in Romania in terms of web accessibility provided by two key institutions in the field of administering social services and benefits in Romania – County Directorates of Social Work and Child Protection (DGASPC) and County Pensions Houses (CJP). The paper starts with a short literature review and then places the topic within the larger theme of forms of digital divide/exclusion, while introducing the country context (together with an introduction to the institutional subordination of the analyzed organizations). The fourth section describes the methodology, and is followed both by a presentation of findings/ results, and a discussion and conclusions section, including points for practitioners and policymakers.

## PREVIOUS RESEARCH

Most of the previous work conducted around the topic of web accessibility develops the operationalization part of making web pages accessible on specific items. Specific research under national contexts has been undertaken in the EU context based on the Web Accessibility Directive and its guidelines. Therefore, compliance with web accessibility rules represents a key topic, with increased relevance given the current pandemic recovery context. For instance, for benchmarking e-government development across EU countries, a separate analysis has been conducted to assess which websites are usable for a large variety of users. The key reference in this respect is the WCAG 2.1 guidelines, covering four main principles related to permeability, operability, understandability, and robustness. The dimensions taken into consideration have been extensively used in both designing public authorities' websites and monitoring/research activities performed on this topic. They include color contrast, alternative texts for images, labels for form elements, audio/video captions, and web pages having titles that describe the topic or purpose. This methodology is considered "a reliable smoke test" that can separate the analyzed websites into two main categories:

(1) if no violations are found, the website is at least potentially accessible;

(2) if violations are found, the website is at least not fully accessible.

The number and type of violations are also reported using the method of mystery shopping. The tool is applied for a series of life events in each EU country, and a selection of relevant national and local URLs are selected and monitored with the support of independent experts. The results are validated by representatives of the national member states. The life events monitored at the EU level include a multitude of separate steps/phases grouped around the following: regular business operations, moving, transport, starting a small claims procedure, business start-up, career, studying, and family. A single-life event, such as a career, includes several separate processes/stages, such as the following:

(1) immediate actions for unemployed individuals;

(2) guidance on additional benefits and allowances (check eligibility for additional unemployment benefits, counseling on how to arrange housing benefits, guidance on how to arrange debt counseling, how to arrange health promotion programs, how to arrange help during invalidity, sickness and employment injuries, apply for a tax refund or other allowances affected by unemployment);

(3) maintaining applicable benefits;

(4) finding a new job and fulfilling duties being employed;

(5) retiring, including calculating future pensions, applying for state pensions, checking entitlement for pensions when moving abroad or returning from another country (European Commission, Directorate-General for Communications Networks, Content and Technology 2021).

At a more general level, the monitoring methodology established by Implementing Decision (EU) 2018/1524 includes:

- the periodicity of the monitoring, and website and mobile application sampling arrangements;
- the sampling of web pages, of the content on those pages, and of the content of mobile apps;
- a description of the way to determine compliance;
- where deficiencies are found, a mechanism to help public sector bodies correct them, and arrangements for automatic, manual and usability tests.

The first monitoring reports were expected to be completed by 23 December 2021 and be made public in an accessible format (Directive (EU) 2016/2102, 2021).

The object of evaluation for web accessibility conformance varies substantially, as the approach represents a methodological lens that can be applied in very different settings – universities (Máñez Carvajal C *et al.* 2021; Ismailova 2017), public institutions (Basdekis et al. 2010, Huang and Benyoucef 2014, Csontos and Heckl 2021), tourist websites (Gonçalves *et al.* 2020), or health applications (Acosta-Vargas 2021), to name but a few.

The method used to examine the compliance of public authorities' websites has proven to be important in ensuring the validity and reliability of findings (Vigo *et al.* 2012; Gambino *et al.* 2016). The importance of manual evaluation, alongside automatic tools, has been highlighted. The method of mystery shopping used in the EU benchmark uses experts' views and triangulates data among several evaluators to increase the accuracy of the findings. Furthermore, the UN Report on e-government records an increase in the number of countries with online information for vulnerable groups, yet a low number of countries offer services for people living in poverty and persons with disabilities (UN 2020).

The type of impairments differentiates the focus of scientific articles published on web accessibility. A recent review of the articles published in one specialized journal[1] shows that research on visual impairment is better represented in papers, compared to the dimensions related to operable and understandable principles (Sandnes 2022). Nonetheless, the same source states that papers dealing with the understandable issue, with the smallest number of identified articles on web accessibility, are associated with a higher number of citations, as are articles based on research conducted without funding. Another study (Bernard *et al.* 2015) suggested specific actions needed to ensure web accessibility for persons with mental disorders. Previous qualitative research grouped web design elements that can represent a barrier in web accessibility for people with mental disorders into the following categories: (1) presenting information – distracting design, information overload, poor organization and presentation, excessive

[1] UAIS – Universal Access in the Information Society.

advertisements; (2) understanding information – confusing menu options, non-perceivable icons, complicated language, complex purchasing process; (3) searching information – poor navigation, unable to locate information, poor filters, malfunctioning search bars and (4) other – time-limited response forms, slow response in websites loading information (Good and Sambhanthan 2014).

Perceptions of web professionals can also play a role in the developed web accessibility features. An online survey showed the importance of considering web accessibility features in the design and implementation phases, while potential neglect can be noticed in the ongoing developments, even after the product's first delivery. Similarly, a focus on visual impairments has been noted (Vollenwyder *et al.* 2020).

Different methodological approaches have been proposed to take into account types of disability. In this respect, a heuristic evaluation of web accessibility oriented to types of disabilities, consisting of five stages, has been proposed (Orozco *et al.* 2016). Again, limitations of using only accessibility evaluation tools are outlined about problems for users with specific impairments (ibid.).

Factors affecting web accessibility can vary, and they can depend on content type, size, and site complexity, as well as on the development tools and environment (Noh *et al.* 2015). A previously developed model describing the factors that influence the accessibility standards of local public institutions differentiates between the factors influencing the adoption and implementation of accessibility. In the adoption phase, several categories of factors are mentioned, as follows: (1) web design process (knowledge and experience, perceived benefits); (2) organizational factors – compatibility, managerial decisions, responsibilities; (3) personal factors – opinion on guidelines, pride, and ambition, disability in a circle; and (4) external factors – citizen influence, legislation on accessibility, other rules and legislation, sponsorship. All these factors have been considered to influence setting importance and priorities. Furthermore, in the implementation phase, the same groups of factors are identified as relevant, this time with different subcategories. This translates to the following: (1) web design process – quality assurance, knowledge and experience, budget and costs, (2) organizational factors – municipal collaboration, selection and procurement of external supplier, responsibilities, (3) personal factors – perceived complexity, and (4) external factors – technical possibilities, complexity (Velleman *et al.* 2017). The same study highlights, through qualitative methods, the need not to understate citizen influence – "if citizens would complain more, this would have a positive effect on the adoption and implementation of accessibility standards" (ibid.). Another study points out the importance of a regulatory authority in enforcing compliance with web accessibility guidelines, such as receiving a certification mark from the National Information Society Agency in Korea (Noh *et al.* 2015). As a conclusive remark, a set of three factors are considered essential for fulfilling web

accessibility guidelines: a content management system (CMS), technological template coding and data to be introduced after a comprehensive understanding of the concept of web accessibility (ibid.).

Other distinctions pertain to the type of device used. Some of the techniques enhancing web accessibility features for persons with disabilities are available only for desktop computers, while examination of their availability on smartphone devices remains a different question (Ramakrishnan *et al.* 2017).

Romania's report on monitoring website accessibility based on a sample of websites of public organizations for the period of 2020–2021 concludes there are several features commonly missing from the websites' monitored: there is a limited focus/visibility; (2) a reduced contrast for text content; (3) data entry fields not correctly associated with the specified labels; (4) content without text for the images; (5) data tables with first row cells lacking correct codes; (6) difficulty in establishing correlations; lack of semantic value for the websites structure and some areas of webpages. In addition, for mobile applications (all for Android), the most frequent lack of conformity has been registered for the following: (1) lack of access to all the functions of the application with browsing based on a screen reader, such as buttons and browsing menus; (2) inappropriate color contrast for texts and/or pictograms; (3) lack of the ability to rotate the screen; (4) lack of the ability to tailor the content to the properties of the user's smartphone configuration (dimensions, fonts, colors); (5) language setting; and (6) absence of alternative content for the images (Authority for Romania's Digitalization 2021).

Finally, web accessibility is useful not only for persons experiencing various types of impairments or deficiencies but also for users of public services in general. A recent pilot project study on web accessibility for persons with cognitive disabilities notes that respondents with cognitive disabilities are almost as likely to find it difficult to understand or navigate websites as those without cognitive disabilities (Kjellstrand *et al.* 2022)[2]. In addition to the functionalities included in the European directive on web accessibility, the same source reveals other barriers, such as navigation, filling in forms, managing login details or usage of complex terms (ibid.).

## RESEARCH BACKGROUND: COUNTRY CONTEXT

Previous recent on the topic research on Romania identified several weaknesses in the implementation of the corresponding legal framework at the national level. The latest diagnosis on the situation of persons with disabilities in Romania identifies several causes for the low ICT use among persons with disabilities, and suggests several steps to be undertaken, to which this paper can directly contribute:

[2] Based on results of a stakeholder consultation.

- Deficiencies in the legal framework: there are not enough technical details on how to implement ICT accessibility in the current legal framework (rule no. 51/2012), and the legal framework for implementing accessibility of the websites of public sector institutions has only been recently enacted.
- Lack of transparent policy documents: the documents describing the policies and programs of public authorities are not published at all or in an accessible format.
- Lack of adequate offers from commercial service providers, namely, from landline and mobile telephony and Internet service providers with respect to services offered/provided for persons with disabilities.
- There is a lack of enough sign language interpreters, a situation that is worsened by a lack of flexible working arrangements for them, alongside poor usage of sign language in television broadcasts (Grigoraș *et al.* 2021).

Hence, several policy recommendations are proposed:

- Develop and implement an "Accessibility Compendium" that could address the issues identified by specifying minimum requirements for the communication and information accessibility of services open to the public (including their websites), as well as for communicating with and consulting persons with disabilities.
- Elaborate a set of regulations for sign language interpreters.
- Create a guide to writing public documents using easy-to-read and easy-to-understand language (ibid.)

Persons with disabilities have less access to information and communication services provided by institutions for the public, with persons with severe disabilities being the most disadvantaged. Approximately 70% of persons without disabilities experienced no difficulty in accessing web pages, compared to 49 percent of persons with some disabilities and only 30 percent of persons with severe disabilities (Grigoraș *et al.* 2021).

The current programming period includes several policy initiative measures aimed at contributing to increased digitalization in central public administration, including life events relevant for citizens or business [31]. The key life events included in Romania's National Digital Agenda Strategy and the most recent public policy in developing e-government in Romania include job searching/ losing a job, birth, marriage, divorce, decease, and obtaining child allowance subsidies. Procedures for obtaining child benefits include the following life events: approval, interruption of payment, resume and entailment of the following: (i) child allowance, (ii) allowance for family support, (iii) child upbringing allowance, (iv) employment incentive, and (v) minimum income guarantee (Government of Romania 2021). Furthermore, the monitoring report produced by Romania on web accessibility specifies that the control of compliance with web accessibility from the EU directive will be made by inspection bodies accredited by the Romanian Association Accreditation (RENAR), finalized with examination reports submitted

to the Authority for Romania's Digitalization (ADR), that will be further included in the monitoring procedure (Authority for Romania's Digitalization 2021).

In terms of institutional subordination, the paper analyzes two types of public administration institutions placed at the county level. One of them, the County Pensions House, represents deconcentrated units or territorial units of the National House of Pensions, which is, in turn, subordinated to the Ministry of Labor, Social Protection and Family (central level authority). Therefore, it is most likely that their web pages will be similar in terms of content and/ or compliance with web accessibility guidelines. The County Directorates of Social Work and Child Protection (DGASPC) are subordinated to the County Councils, which represent the second tier of local public administration. Hence, they are completely autonomous with respect to central-level authorities, yet the DGASPC can benefit from "methodological coordination" from the relevant central-level authorities, as is the case with the National Authority for the Rights of Persons with Disabilities, Children and Adoptions (ANDPDCA). County council representatives are elected through electoral ballot, and consequently, presidents of the county councils are representatives of the political parties/ coalitions of political parties winning the elections at the local – county level.

The next section presents the methodological approach, results grouped by a general overview, criteria and institution, while the final sections provide conclusive remarks and suggest steps for further research.

## METHODS

Data collection was carried out in the period of April – May 2022. The study uses a conformance evaluation as the basic evaluation method. A grid for assessment has been drafted based on desk research, as well as on the availability of information on the monitored websites. The key methodological reference used for developing the items in the methodological grid is represented by the Web Content Accessibility Guidelines (WCAG) 2.1 requirements (success criteria) and techniques[3]. The selection is based on Level A, which stands for the minimum level of conformance[4]. In addition, several criteria that are placed under the next level of conformance (AA) have been selected, in accordance with the structure of available information found on the monitored websites. As presented in Table 1, the assessment grid includes criteria from all four principles: perceivable, operable, understandable and robust. The Annex of the paper presents the definitions used for each criterion. Notably, the monitoring report issued for Romania on

[3] https://www.w3.org/WAI/WCAG21/quickref/?showtechniques=124%2C144.

[4] This further means that the Web page satisfies all the Level A Success Criteria, or a conforming alternate version is provided (https://www.w3.org/WAI/WCAG21/Understanding/conformance#levels).

compliance with the EU Directive on web accessibility used the same WCAG 2.1 standards.

*Table no. 1*

**Grid of monitoring items, based on WCAG 2.1.**

| Principle Number | Guideline Number | Criterion Name | Level |
|---|---|---|---|
| Principle 1 – Perceivable | Guideline 1.1 – Text Alternatives | Nontext Content | A |
| Principle 1 – Perceivable | Guideline 1.2 – Time-based Media | Audio-only and Video-only (Prerecorded) | A |
| Principle 1 – Perceivable | Guideline 1.2 – Time-based Media | Captions (Prerecorded) | A |
| Principle 1 – Perceivable | Guideline 1.2 – Time-based Media | Audio Description or Media Alternative (Prerecorded) | A |
| Principle 1 – Perceivable | Guideline 1.3 – Adaptable | Info and Relationships | A |
| Principle 1 – Perceivable | Guideline 1.3 – Adaptable | Meaningful Sequence | A |
| Principle 1 – Perceivable | Guideline 1.3 – Adaptable | Sensory Characteristics | A |
| Principle 1 – Perceivable | Guideline 1.4 – Distinguishable | Use of Color | A |
| Principle 1 – Perceivable | Guideline 1.4 – Distinguishable | Audio Control | A |
| Principle 1 – Perceivable | Guideline 1.4 – Distinguishable | Contrast (Minimum) | AA |
| Principle 1 – Perceivable | Guideline 1.4 – Distinguishable | Reversed colors | AA |
| Principle 1 – Perceivable | Guideline 1.4 – Distinguishable | Contrasting colors | AA |
| Principle 1 – Perceivable | Guideline 1.4 – Distinguishable | Bright background | AA |
| Principle 1 – Perceivable | Guideline 1.4 – Distinguishable | Resize text/Increased font | AA |
| Principle 1 – Perceivable | Guideline 1.4 – Distinguishable | Resize text/Decreased font | AA |
| Principle 1 – Perceivable | Guideline 1.4 – Distinguishable | Dyslexia friendly | AA |
| Principle 1 – Perceivable | Guideline 1.4 – Distinguishable | Text Spacing | AA |
| Principle 1 – Perceivable | Guideline 1.4 – Distinguishable | Tool Tips | AA |
| Principle 1 – Perceivable | Guideline 1.4 – Distinguishable | Line Height | AA |
| Principle 1 – Perceivable | Guideline 1.4 – Distinguishable | Text a Align | AA |
| Principle 2 – Operable | Guideline 2.1 – Keyboard Accessible | Keyboard | A |
| Principle 2 – Operable | Guideline 2.1 – Keyboard Accessible | No Keyboard Trap | A |
| Principle 2 – Operable | Guideline 2.1 – Keyboard Accessible | Character Key Shortcuts | A |
| Principle 2 – Operable | Guideline 2.2 – Enough Time | Timing Adjustable | A |
| Principle 2 – Operable | Guideline 2.2 – Enough Time | Pause, Stop, Hide | A |
| Principle 2 – Operable | Guideline 2.3 – Seizures and Physical Reactions | Three Flashes or Below Threshold/Stop the flashes | A |
| Principle 2 – Operable | Guideline 2.3 – Seizures and Physical Reactions | Three Flashes or Below Threshold/Whether it has flashes or not | A |
| Principle 2 – Operable | Guideline 2.4 – Navigable | Bypass Blocks | A |
| Principle 2 – Operable | Guideline 2.4 – Navigable | Page Titled | A |
| Principle 2 – Operable | Guideline 2.4 – Navigable | Focus Order | A |

| Principle Number | Guideline Number | Criterion Name | Level |
|---|---|---|---|
| Principle 2 – Operable | Guideline 2.4 – Navigable | Link Purpose (In Context) | A |
| Principle 2 – Operable | Guideline 2.5 – Input Modalities | Pointer Gestures | A |
| Principle 2 – Operable | Guideline 2.5 – Input Modalities | Pointer Cancellation | A |
| Principle 2 – Operable | Guideline 2.5 – Input Modalities | Label in Name | A |
| Principle 2 – Operable | Guideline 2.5 – Input Modalities | Motion Actuation | A |
| Principle 3 – Understandable | Guideline 3.1 – Readable | Language of Page | A |
| Principle 3 – Understandable | Guideline 3.2 – Predictable | On Focus | A |
| Principle 3 – Understandable | Guideline 3.2 – Predictable | On Input | A |
| Principle 3 – Understandable | Guideline 3.3 – Input Assistance | Error Identification | A |
| Principle 3 – Understandable | Guideline 3.3 – Input Assistance | Labels or Instructions | A |
| Principle 4 – Robust | Guideline 4.1 – Compatible | Parsing | A |
| Principle 4 – Robust | Guideline 4.1 – Compatible | Name, Role, Value | A |

Each item has been assessed depending on its availability and functionality on the webpage. Therefore, each item represents a binary variable for the institution. Given the rather early stages of development of web accessibility, the evaluators chose to assess with "1" designating fulfilment of the subcriteria, even if there was only "partial fulfilment" of the criterion. The researcher has effectively tried the functionality on the web page only in the case of a selection of items, more often with the items concerning screen reader (audio control) or keyboard accessibility. The assessment has been conducted both manually, as well as with the support of online tools, such as the ones available at www.accessibilitychecker.org, audit.deque.com/or wave – web accessibility evaluation tool – wave.webaim.org/, in line with previous studies conducted on this topic (Máñez Carvajal *et al.* 2021, Ismailova and Kimsanova 2017, Hilera *et al.* 2018, Rau 2016). We consider that a combination of results yielded by automatic assessment, with reduced subjectivity but limited on the type of signaled errors, alongside manual checking (although associated with increased subjectivity) can provide, from the methodological point of view, more accurate results.

Nonetheless, for a more rigorous assessment, it would be useful to use a navigation experience conducted by persons with visual or hearing impairments in search for particular information – for instance, for renewal or assessment conducted for issuing the disability certificate, or for obtaining the European Disability Card (in the case of the webpage of DGASPC), or for applying for an invalidity pension (in the case of the County Pensions House).

All webpages of two key institutions have been assessed, in total 89 webpages, namely, 47 webpages for the County General Directorates of Social Work and Child Protection (41 counties and six districts of the municipality of Bucharest), and a total sum of 42 URLs for the County House of Pensions (41 counties and one for the municipality of Bucharest, as all the territorial house of pensions from the districts of Bucharest have the same webpage). The sample of URLs was initially collected by the researcher based on the information provided at the central level by the corresponding two central-level public administration institutions: the National Authority for the Rights of Persons with Disabilities, Children and Adoptions (ANDPDCA)[5] and the National House of Pensions.[6] However, the weblinks provided by these two institutions proved to be inaccurate in multiple cases. If the webpage link did not work, the researcher tried to find the appropriate webpage with the support of a search engine. In addition, other errors in this list have been identified in the case of DGASPC web pages – the web links provided by the central authority, although functional, did not direct the user to the DGASPC webpage but to the county council web page (to which DGASPC is subordinated). However, all DGASPCs have their own webpages, with relevant and detailed information for accessing social services and benefits. Therefore, the researcher also looked for the webpage corresponding to DGASPC (instead of the mayoralty in the case of Bucharest, or instead of the County Council for the rest of the counties).

Limitations of the research include the inherent subjectivity included in manual checking, together with not assessing the functionalities on the mobile applications (if they exist). Nonetheless, the findings presented in the paper contribute to assessing the current stage of web accessibility for persons with disabilities in the case of two key institutions responsible for social services and benefits in Romania. Further research steps can extend the structure of the assessment grid, the list of assessed institutions and/ or include mobile applications if the case occurs.

## RESULTS

### General Overview

There are still a large number of public institutions with webpages complying with a limited (low) number of the examined criteria out of the total sample of examined institutions. The findings are highly relevant, as these institutions provide services for persons with disabilities and older persons with visual impairments. The share is larger in the case of the County Houses of Pensions.

[5] *Source*: http://andpdca.gov.ro/w/directiile-generale-de-asistenta-sociala-si-protectia-copilului/.

[6] *Source*: https://www.cnpp.ro/casele-teritoriale-de-pensii.

The page layout is highly heterogeneous for websites related to the same kind of administration bodies, as in the case of County Houses of Pensions. Although they are subordinated to the same central level institution and represent deconcentrated units, a common web page layout is not the case across the examined territorial institutions.

Common web accessibility features are present only in disparate cases across both deconcentrated and decentralized units. They mainly refer to using web accessibility services as provided by userway.org, which displays various accessibility characteristics. In the case of DGASPCs, this feature has been identified in the case of six web pages (out of a total of 47 webpages).

There is a large diversity among the names of URLs of the examined institutional websites. In a significant number of cases, they cannot be found without the support of a search engine, especially as the central level authorities provide faulty weblinks. "An ordinary rule, which holds for commercial websites, consists of including the name of the brand or the name of the company as a part of the URL, so that the potential customer can find the website without the use of a search engine" (Gambino *et al.* 2014, 311). This rule is hardly complied with in the case of analyzed URLs. Some of them do not even include the name of the county or they include some details that can hardly be anticipated even by a proficient user, as follows:

- The name of the URL corresponding to DGASPC Ilfov is protectiacopilului.ro, meaning childprotection.ro, which stands for a general field, not indicating either the acronym of the institution or the county. It could be the name of a general organization working in the field of child protection, not of a specific county-level public institution.
- The name of the URL corresponding to the County House of Pensions from Dâmbovița is www.cjp-dambovita.minisat.ro, meaning it includes minivillage, which does not make any reference to the relevant activities of the institution. Furthermore, this name of the website can hardly be assessed as "easy to remember".
- Deconcentrated units have completely different names for the webpages, formed by the word "pensions" and the name of the county (pensiialba.ro or pensii-botosani.ro), or by the acronym from the county house of pensions (cjp) and name of the county (cjpbacau.ro), but there is no common rule that can work across the analyzed domains.

Increased font size and different contrast options represent the most common web accessibility characteristics (from the module of items explicitly signaling accessibility items). Other features used are the gray tones (white/ black options), alongside a readable font and highlighting links, for both types of institutions. The option of a screen reader has been found only in the case of a low number of institutions. Another important but hardly used feature is that of reporting a problem. It has been identified as part of the accessibility package in the case of six

general county directorates for social work and child protection and seven county houses of pensions. Notably, the EU decision on implementation included that the accessibility statement should cover "a description on how a user may report any failure to comply with this directive or request information that is excluded from the scope of this directive, as well as a link to a complaint mechanism, if the response is inadequate" (Implementing Decision (EU) 2018/1523). Furthermore, some of the analyzed webpages have been created (in the previous programming period) with the support of EU funds, and still display few accessibility characteristics.

Web accessibility features are signaled in a considerably heterogeneous way on each webpage. Notably, some of them are named in English[7], even though the language version of the webpage is Romanian. Even in Romanian, the same sign is labeled differently from one URL to another. For instance, the feature corresponding to "gray tones" is named "white and black" or "monochromatic" in other instances. Consequently, the user must be highly focused/minded on identifying accessibility features on various URLs. For instance, accessibility features are usually placed on the upper right corner of the webpage, but this is not the case in an extensive number of cases, as detailed below:

- The County Houses of Pensions from Mures and Hunedoara placed them in the left corner of the webpage.
- The County House of Pensions from Iasi placed some information in PDF format under the section on Accessibility (and did not implement specific web accessibility features, based on the examined list of items). The same holds for DGASPC Constanța.
- DGASPC Galați placed the web accessibility features in the middle of the webpage underneath the topics of the menu, unlike any other institution.
- DGASPC Caraș Severin placed a button for increasing the contrast of the webpage in the right upper corner of the webpage, while the button for increasing/decreasing the font size is placed on the left side of the screen. This is, again, a placement different from any other analyzed institution.

Some institutions have only one or two web accessibility features (from the listing of items usually provided by the userway), mostly related to increasing or decreasing the font. For the case of institutions for pensions, this holds true for the bodies from Covasna and Sălaj. In the case of DGASPCs, these are Bacău, Bihor, Hunedoara, Ialomița and Prahova. However, in the case of DGASPC Bacău and Hunedoara, the available feature is represented by the screen reader.

In the process of examining the webpages, the researcher has also been able to identify increased communication through e-mails, which means that this form of electronic communication has significantly developed as a result of the

[7] For example, the county house of pensions from Galați, Mureș or DGASPC from Maramureș.

pandemic context. Therefore, the topic of web accessibility can only grow in importance and relevance given the current circumstances.

## Results by criteria and type of institution

The highest scores for the assessed indicators belong to the criteria regarding no keyboard trap, character key shortcuts (Principle 2 – Operable), error identification (Principle 3 – Understandable), and meaningful sequence (Principle 1 – Perceivable) with respect to the total number of assessed institutions. The results are similar for the two types of institutions under study. Almost all (shares of more than 90 percent) have been identified as fulfilling these criteria for both DGASPCs and County House of Pensions. In contrast, no institution, or only a very few cases have been identified as fulfilling the criteria concerning motion actuation, pointer cancellation (Principle 2 – Operable), captions (Principle 1 – Perceivable) and name, role, value and parsing (Principle 4) (*Table no. 2*).

*Table no. 2*

**Results by criteria, % of institutions fulfilling the examined criteria**

| Principle Number | Criterion Name | County House of Pensions – CHP (42) | DGASPCs (47) | % of total institutions |
|---|---|---|---|---|
| Principle 1 – Perceivable | Nontext Content | 6 | 5 | 12.36 |
| Principle 1 – Perceivable | Audio-only and Video-only (Prerecorded) | 1 | 8 | 10.11 |
| Principle 1 – Perceivable | Captions (Prerecorded) | 1 | 2 | 3.37 |
| Principle 1 – Perceivable | Audio Description or Media Alternative (Prerecorded) | 1 | 10 | 12.36 |
| Principle 1 – Perceivable | Info and Relationships | 24 | 21 | 50.56 |
| Principle 1 – Perceivable | Meaningful Sequence | 39 | 44 | 93.26 |
| Principle 1 – Perceivable | Sensory Characteristics | 36 | 41 | 86.52 |
| Principle 1 – Perceivable | Use of Color | 33 | 39 | 80.90 |
| Principle 1 – Perceivable | Audio Control | 2 | 7 | 10.11 |
| Principle 1 – Perceivable | Contrast – minimum, White and gray tones | 25 | 26 | 57.30 |
| Principle 1 – Perceivable | Reversed colors | 25 | 22 | 52.81 |
| Principle 1 – Perceivable | Contrasting colors | 24 | 17 | 46.07 |

| | | | | |
|---|---|---|---|---|
| Principle 1 – Perceivable | Bright Background | 27 | 12 | 43.82 |
| Principle 1 – Perceivable | Resize Text/Increased Font | 27 | 35 | 69.66 |
| Principle 1 – Perceivable | Resize text/Decreased font | 18 | 29 | 52.81 |
| Principle 1 – Perceivable | Dyslexia Friendly | 14 | 10 | 26.97 |
| Principle 1 – Perceivable | Text Spacing | 9 | 7 | 17.98 |
| Principle 1 – Perceivable | Tool Tips | 7 | 6 | 14.61 |
| Principle 1 – Perceivable | Line Height | 9 | 7 | 17.98 |
| Principle 1 – Perceivable | Text Align | 8 | 6 | 15.73 |
| Principle 2 – Operable | Keyboard | 19 | 12 | 34.83 |
| Principle 2 – Operable | No Keyboard Trap | 39 | 47 | 96.63 |
| Principle 2 – Operable | Character Key Shortcuts | 41 | 44 | 95.51 |
| Principle 2 – Operable | Timing Adjustable | Not applicable | 2 | Not applicable |
| Principle 2 – Operable | Pause, Stop, Hide | Not applicable | 10 | Not applicable |
| Principle 2 – Operable | Three Flashes or Below Threshold/Stop the flashes option | 6 | 6 | 13.48 |
| Principle 2 – Operable | Three Flashes or Below Threshold/Whether it has flashes or not | 14 | 22 | 40.45 |
| Principle 2 – Operable | Bypass Blocks | 20 | 28 | 53.93 |
| Principle 2 – Operable | Page Titled | 36 | 43 | 88.76 |
| Principle 2 – Operable | Focus Order | 37 | 38 | 84.27 |
| Principle 2 – Operable | Link Purpose (In Context) | 20 | 5 | 28.09 |
| Principle 2 – Operable | Pointer Gestures | 13 | 29 | 47.19 |
| Principle 2 – Operable | Pointer Cancellation | 0 | 1 | 1.12 |
| Principle 2 – Operable | Label in Name | 22 | 15 | 41.57 |
| Principle 2 – Operable | Motion Actuation | 0 | 0 | 0.00 |
| Principle 3 – | Language of Page | 27 | 40 | 75.28 |

| | | | | |
|---|---|---|---|---|
| Understandable1 | | | | |
| Principle 3 – Understandable | On Focus | 19 | 15 | 38.20 |
| Principle 3 – Understandable | On Input | 34 | 42 | 85.39 |
| Principle 3 – Understandable | Error Identification | 38 | 46 | 94.38 |
| Principle 3 – Understandable | Labels or Instructions | 35 | 22 | 64.04 |
| Principle 4 – Robust | Parsing | 4 | 1 | 5.62 |
| Principle 4 – Robust | Name, Role, Value | 2 | 1 | 3.37 |

*Source*: Authors' assessments on the monitored webpages. Data present the number of institutions complying with each subcriterion. The difference up to the total number does not necessarily mean that the rest of institutions do not comply with the criteria, as in some cases the code "not applicable" can add up to the total number of cases.

Most of the public social assistance and child protection institutions at the county level conform to approximately 40 percent of the total number of criteria assessed. The highest share of conformance (67 percent) has been identified in the case of an institution from the municipality of Bucharest, followed by Sibiu, Covasna, Maramureș, Argeș, Călărași, Alba, Vâlcea and Vaslui. In total, only nine institutions comply with half or more than half of the assessed criteria, with none of them actually complying with all of the criteria. Similar results are found concerning the County House of Pensions, yet with a slightly higher number of institutions conforming to more than half of the examined criteria, more precisely 16 institutions (*Table no. 3*).

*Table no. 3*

**Results by institution, % of fulfilled criteria by institution**

| | **CHP** | **DGASPC** |
|---|---|---|
| Minimum | 17 | 26 |
| Maximum | 67 | 67 |
| Mode | 31 | 41 |
| Mean | 43.2 | 41.7 |
| Total number of values | 42 | 47 |

*Source*: Authors' assessments on the monitored webpages. Data present the share of criteria fulfilled by each institution in the total number of examined criteria.

## DISCUSSION AND CONCLUSIONS

This paper examines the current situation in Romania, in terms of web accessibility provided by two key-institutions in the field of administering social

services and benefits in Romania. The analysis is both timely and relevant. The current timeframe, characterized by the requirements for the implementation and monitoring of the European directive on web accessibility, can be regarded as an opportunity to improve the experience of end users, while focusing on their different needs. This study makes a direct contribution to studying and formulating recommendations for two social protection institutions in Romania. Part of the research results are transferrable – the methodology employed can be translated into other contexts, different institutional settings or countries.

This study shows important steps undertaken by Romanian public authorities toward web accessibility, as outlined by the implementation of several features included in the international guidelines. Using a common standard on web accessibility could also potentially result in increased homogeneity among the websites of the examined public authorities. This recommendation might prove more feasible in the case of the County House of Pensions, as they represent deconcentrated institutions.

Nevertheless, there are still significant discrepancies in implementing various accessibility characteristics even among similar institutional bodies. In the same vein, there are still differences concerning the name of the URLs, signaling, placing, or labeling of the implemented characteristics. This means that the user has to learn extensively how to find a specific feature, which reduces the usability of the displayed information. The limited accessibility of institutional websites has also been signaled in other national contexts – to name but a few, Italy (Gambino *et al.* 2016), Hungary (Csontos and Heckl 2021), Greece (Basdekis *et al.* 2010), and the UK (Huang and Benyoucef 2014). For the case of Romania, the results are partially aligned with those outlined in the monitoring report submitted by Romania on website and mobile application accessibility for the case of public institutions (Authority for Romania's Digitalization 2021).

This paper further advances knowledge on the topic of compliance with web accessibility rules. It also contributes to the international debate on web accessibility evaluation and developing accessibility in web design, especially in the case of public authorities who have under their responsibility services directly addressed to persons with disabilities or to older persons with visual or hearing impairments. Further steps can include, among other issues, examination of potential security issues, in dependence on the type of content management system (Ismailova and Kimsanova 2017), or a focus on specific potential accessibility barriers for persons with mental disorders (Bernard *et al.* 2015, Good and Sambhanthan 2014). If enlarging the sample of examined webpages, a sampling method must be employed to ensure a good representation of the entire website (Zhang *et al.* 2015). Nonetheless, it is necessary to study the actual experience of end users in accessing these websites. As the pandemic context further accelerated the development of e-government worldwide and several key life events have been and continue to be digitalized, there is a strong need to ensure information and

communication accessibility for persons with disabilities. The features of including accessible complaint mechanisms in the webpages of public authorities can also support better monitoring of the quality of provided social services and benefits (including those related to retirement, as analyzed in this paper). It can pave the way to increased social inclusion (Ferri and Favalli 2018).

At the level of practitioners, the recommendations for web design can be aligned to three key dimensions as outlined in previous studies: (1) information searching; (2) organization and presentation of information, and (3) understanding of information (Good and Sambhanthan 2014), all framed in the view proposed by Kjellstrand, 2022, stating that "cognitive accessibility benefits everyone".

In summary, there are still significant steps to be undertaken by Romanian social protection institutions to improve all three parts covering digital accessibility: (1) technical development (assimilated to the authoring tool); (2) design part (user interface) and (3) content part (text, graphical representations, audio content, etc.), and ensure compliance with the needs of different types of users, with various types and degrees of impairments. In this respect, the current study is useful for a comprehensive assessment of the current status as a trigger for building improvements, based on the guidelines already developed for public authorities (Funka Guidelines for public sector authorities).

**Annex**

**List of criteria and description for each criteria**

| Principle Number | Guideline Number | Criterion Name | Criterion Number | Description |
|---|---|---|---|---|
| Principle 1 – Perceivable | Guideline 1.1 – Text Alternatives | Nontext Content | 1.1.1. | All nontext content that is presented to the user has a text alternative that serves the equivalent purpose, except for specific situations. |
| Principle 1 – Perceivable | Guideline 1.2 – Time-based Media | Audio-only and Video-only (Prerecorded) | 1.2.1 | For prerecorded audio-only and prerecorded video-only media, the following are true, except when the audio or video is a media alternative for text and is clearly labeled as such |
| Principle 1 – Perceivable | Guideline 1.2 – Time-based Media | Captions (Prerecorded) | 1.2.2 | Captions are provided for all prerecorded audio content in synchronized media, except when the media is a media alternative for text and is clearly labeled as such. |
| Principle 1 – Perceivable | Guideline 1.2 – Time-based Media | Audio Description or Media Alternative (Prerecorded) | 1.2.3 | An alternative for time-based media or audio description of the prerecorded video content is provided for synchronized media, except when the media is a media alternative for text and is clearly labeled as such. |
| Principle 1 – Perceivable | Guideline 1.3 – Adaptable | Info and Relationships | 1.3.1 | Information, structure, and relationships conveyed through presentation can be programmatically determined or are available in text. |
| Principle 1 – Perceivable | Guideline 1.3 – Adaptable | Meaningful Sequence | 1.3.2 | When the sequence in which content is presented affects its meaning, a correct reading sequence can be programmatically determined. |
| Principle 1 – Perceivable | Guideline 1.3 – Adaptable | Sensory Characteristics | 1.3.3 | Instructions provided for understanding and operating content do not rely solely on sensory characteristics of components, such as shape, color, size, visual location, orientation, or sound. |
| Principle 1 – Perceivable | Guideline 1.4 – Distinguishable | Use of Color | 1.4.1 | Color is not used as the only visual means of conveying information, indicating an action, prompting a response, or distinguishing a visual element. |

| Principle Number | Guideline Number | Criterion Name | Criterion Number | Description |
|---|---|---|---|---|
| Principle 1 – Perceivable | Guideline 1.4 – Distinguishable | Audio Control | 1.4.2 | If any audio on a Web page plays automatically for more than 3 seconds, either a mechanism is available to pause or stop the audio, or a mechanism is available to control audio volume independently from the overall system volume level. |
| Principle 1 – Perceivable | Guideline 1.4 – Distinguishable | Contrast (Minimum) | 1.4.3 | The visual presentation of text and images of text has a contrast ratio of at least 4.5:1, except for specific situations. |
| Principle 1 – Perceivable | Guideline 1.4 – Distinguishable | Reversed colors | 1.4.3 | Reversed colors option available |
| Principle 1 – Perceivable | Guideline 1.4 – Distinguishable | Contrasting colors | 1.4.3 | Contrasting color option available |
| Principle 1 – Perceivable | Guideline 1.4 – Distinguishable | Bright background | 1.4.3 | Bright background option available |
| Principle 1 – Perceivable | Guideline 1.4 – Distinguishable | Resize text/Increased font | 1.4.4 | Except for captions and images of text, text can be resized without assistive technology up to 200 percent without loss of content or functionality/ Increased font option available |
| Principle 1 – Perceivable | Guideline 1.4 – Distinguishable | Resize text/Decreased font | 1.4.4 | Except for captions and images of text, text can be resized without assistive technology up to 200 percent without loss of content or functionality/Decreased font option available |
| Principle 1 – Perceivable | Guideline 1.4 – Distinguishable | Dyslexia friendly | 1.4.4 | Dyslexia friendly option |
| Principle 1 – Perceivable | Guideline 1.4 – Distinguishable | Text Spacing | 1.4.12 | In content implemented using markup languages that support the following text style properties, no loss of content or functionality occurs by setting all of the following and by changing no other style property |
| Principle 1 – Perceivable | Guideline 1.4 – Distinguishable | Tool tips | 1.4.12 | Tool tips option available |
| Principle 1 – Perceivable | Guideline 1.4 – | Line Height | 1.4.12 | Line height option available |

| Principle Number | Guideline Number | Criterion Name | Criterion Number | Description |
|---|---|---|---|---|
| | Distinguishable | | | |
| Principle 1 – Perceivable | Guideline 1.4 – Distinguishable | Text align | 1.4.12 | Text align option available |
| Principle 2 – Operable | Guideline 2.1 – Keyboard Accessible | Keyboard | 2.1.1 | All functionality of the content is operable through a keyboard interface without requiring specific timings for individual keystrokes, except where the underlying function requires input that depends on the path of the user's movement and not just the endpoints. |
| Principle 2 – Operable | Guideline 2.1 – Keyboard Accessible | No Keyboard Trap | 2.1.2 | If keyboard focus can be moved to a component of the page using a keyboard interface, then focus can be moved away from that component using only a keyboard interface, and, if it requires more than unmodified arrow or tab keys or other standard exit methods, the user is advised of the method for moving focus away. |
| Principle 2 – Operable | Guideline 2.1 – Keyboard Accessible | Character Key Shortcuts | 2.1.4 | If a keyboard shortcut is implemented in content using only letter (including upper- and lower-case letters), punctuation, number, or symbol characters, then at least one of the following is true: turn off, remap, active only on focus. |
| Principle 2 – Operable | Guideline 2.2 – Enough Time | Timing Adjustable | 2.2.1 | For each time limit that is set by the content, at least one of the following is true: turn off, adjust, extend, real-time exception, essential exception, 20 Hour Exception |
| Principle 2 – Operable | Guideline 2.2 – Enough Time | Pause, Stop, Hide | 2.2.2 | For moving, blinking, scrolling, or autoupdating information, all of the following are true: moving, blinking, scrolling, Autoupdating |
| Principle 2 – Operable | Guideline 2.3 – Seizures and Physical Reactions | Three Flashes or Below Threshold/Stop the flashes | 2.3.1 | Web pages do not contain anything that flashes more than three times in any one second period, or the flash is below the general flash and red flash thresholds. |
| Principle 2 – Operable | Guideline 2.3 – | Three Flashes or | 2.3.1 | Whether there are or not flashes |

| Principle Number | Guideline Number | Criterion Name | Criterion Number | Description |
|---|---|---|---|---|
| | Seizures and Physical Reactions | Below Threshold/Whether it has flashes or not | | |
| Principle 2 – Operable | Guideline 2.4 – Navigable | Bypass Blocks | 2.4.1 | A mechanism is available to bypass blocks of content that are repeated on multiple Web pages. |
| Principle 2 – Operable | Guideline 2.4 – Navigable | Page Titled | 2.4.2 | Web pages have titles that describe topic or purpose. |
| Principle 2 – Operable | Guideline 2.4 – Navigable | Focus Order | 2.4.3 | If a Web page can be navigated sequentially and the navigation sequences affect meaning or operation, focusable components receive focus in an order that preserves meaning and operability. |
| Principle 2 – Operable | Guideline 2.4 – Navigable | Link Purpose (In Context) | 2.4.4 | The purpose of each link can be determined from the link text alone or from the link text together with its programmatically determined link context, except where the purpose of the link would be ambiguous to users in general. |
| Principle 2 – Operable | Guideline 2.5 – Input Modalities | Pointer Gestures | 2.5.1 | All functionality that uses multipoint or path-based gestures for operation can be operated with a single pointer without a path-based gesture, unless a multipoint or path-based gesture is essential. |
| Principle 2 – Operable | Guideline 2.5 – Input Modalities | Pointer Cancellation | 2.5.2 | For functionality that can be operated using a single pointer, at least one of the following is true: No Down-Event, Abort or Undo, Up Reversal, Essential |
| Principle 2 – Operable | Guideline 2.5 – Input Modalities | Label in Name | 2.5.3 | For user interface components with labels that include text or images of text, the name contains the text that is presented visually. |
| Principle 2 – Operable | Guideline 2.5 – Input Modalities | Motion Actuation | 2.5.4 | Functionality that can be operated by device motion or user motion can also be operated by user interface components and responding to the motion can be disabled to prevent accidental actuation, except when: supported interface, essential |

| **Principle Number** | **Guideline Number** | **Criterion Name** | **Criterion Number** | **Description** |
|---|---|---|---|---|
| Principle 3 – Understandable | Guideline 3.1 – Readable | Language of Page | 3.1.1 | The default human language of each Web page can be programmatically determined. |
| Principle 3 – Understandable | Guideline 3.2 – Predictable | On Focus | 3.2.1 | When any user interface component receives focus, it does not initiate a change of context. |
| Principle 3 – Understandable | Guideline 3.2 – Predictable | On Input | 3.2.2 | Changing the setting of any user interface component does not automatically cause a change of context, unless the user has been advised of the behavior before using the component. |
| Principle 3 – Understandable | Guideline 3.3 – Input Assistance | Error Identification | 3.3.1 | If an input error is automatically detected, the item that is in error is identified, and the error is described to the user in text. |
| Principle 3 – Understandable | Guideline 3.3 – Input Assistance | Labels or Instructions | 3.3.2 | Labels or instructions are provided when content requires user input. |
| Principle 4 – Robust | Guideline 4.1 – Compatible | Parsing | 4.1.1 | In content implemented using markup languages, elements have complete start and end tags, elements are nested according to their specifications, elements do not contain duplicate attributes, and any IDs are unique, except where the specifications allow these features. |
| Principle 4 – Robust | Guideline 4.1 – Compatible | Name, Role, Value | 4.1.2 | For all user interface components (including but not limited to: form elements, links and components generated by scripts), the name and role can be programmatically determined; states, properties, and values that can be set by the user can be programmatically set; and notification of changes to these items is available to user agents, including assistive technologies. |

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*Această lucrare analizează situația actuală privind accesibilizarea site-urilor web ale unor instituții cheie pentru administrarea serviciilor și a beneficiilor sociale în România – Direcțiile Generale de Asistență Socială și Protecția Copilului (DGASPC) și Casele Județene de Pensii (CJP). În condițiile în care contextul pandemic a accelerat dezvoltarea globală a e-guvernării, există o nevoie substanțială de a asigura accesibilizarea informării și a comunicării pentru persoane cu dizabilități și persoane cu limitări funcționale în general. Cadrul de evaluare este reprezentat de cerințele stabilite de Web Content Accessibility Guidelines (WCAG) 2.1, legate în principal de nivelul A, privind nivelul minim de conformare. Rezultatele indică discrepanțe semnificative, între structuri instituționale similare, în implementarea unor caracteristici variate de accesibilizare, Sunt subliniate și nevoi de a realiza schimbări care să îmbunătățească accesibilizarea. Studiul contribuie la o mai bună cunoaștere a unei teme mai largi, cea a incluziunii digitale, ca o contribuție la creșterea incluziunii sociale. Lucrarea reprezintă și o contribuție la dezbaterea internațională privind evaluarea accessibilizării web și dezvoltarea accesibilizării în designul web, în special în cazul autorităților publice care au în responsabilitate servicii care se adresează direct persoanelor cu dizabilități sau persoanelor vârstnice cu limitări vizuale sau de auz.*

***Cuvinte-cheie**: accesibilizarea web; România; servicii sociale; incluziune digitală; persoane cu dizabilități; persoane cu limitări funcționale.*

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