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Chapter 16. PERSONALIZED ASSESSMENT OF WEB CONTENT ACCESSIBILITY FOR PEOPLE WITH SPECIAL NEEDS

16.1. Introduction

Nowadays, we are increasingly obliged to use websites and Internet applications to deal with official, financial and professional matters. This trend was intensified during the COVID-19 pandemic, which led many companies and public institutions to enable communication via the Internet. A consequence of the introduction of Internet-based solutions may be that it is more difficult for people who are excluded because of their disability to access information. The most technically excluded people are the elderly. This is a group at risk of all kinds of impairments (e.g. eyesight, hearing) [1]. Of course, there is also a large group of other people who, due to problems related to various types of disabilities, are excluded because of technological limitations or software shortcomings. Although accessibility at first sight seems to benefit mainly people with disabilities, it also brings many advantages to the rest of the users [16], because the environmental influence can also cause accessibility problems [9]. A way of verifying the usability [10] of websites for a person with special needs could be a personalized accessibility assessment.

At present, tools for automatic web accessibility analysis treat the assessment in a general way, examining compliance with all possible WCAG guidelines. However, the accessibility problem is often personal. Therefore, even a very high overall accessibility score obtained with any of the existing tools does not necessarily mean that a web application or a website is accessible to a user with specific special needs.

The main website for all patients in Poland is *www.pacjent.gov.pl*. It will be used to find an answer for research question: *How to make a personalized website accessibility*

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assessment for patients with special needs? To find the answer, we will first try to identify the accessibility needs of the user-patient looking for information on the Internet. We will then propose a method for calculating the accessibility factor. Finally, we will consider whether to apply it to the results of an automated or manual audit.

16.2. Web content accessibility

This article focuses on worldwide guidelines for web content accessibility. However, it is important to note that accessibility is a wide topic, so it is important to mention equally important documents describing accessibility guidelines for web browsers and the software used to create them. These include:

- key components of Internet accessibility [20],
- description of the guidelines for the accessibility of user programs [21],
- description of the guidelines for the accessibility of authoring tools [22].

Accessibility assessments are carried out through a variety of approaches, each with specific benefits. These approaches include automated checking by specific tools, manual validations by accessibility experts and empirical evaluations [8].

16.2.1. Accessibility guidelines

The Web Content Accessibility Guidelines (WCAG) is a part of a series of web accessibility guidelines published by the Web Accessibility Initiative (WAI) of the World Wide Web Consortium (W3C), the main international standards organization for the Internet. They are a set of recommendations for making Web content more accessible, primarily for people with disabilities. The requirements described in WCAG 1.0 included the provision of alternatives to visual and auditory content, guarantees of contextual information, orientation and features to navigate the site using assistive technologies supporting people with disabilities [4].

The W3C received a lot of feedback indicating the need to update the guidelines to improve them, to make them more understandable to a wide audience, easier to implement, and more precisely formulated to be easier to test [17]. As a consequence, WCAG 2.0 was created, ensuring that relevant information can be found for both technical and non-technical audiences [23]. The document is organized into four layers:

- *principles* – provide the foundation for Web accessibility: *perceivable*, *operable*, *understandable*, and *robust*,
- *guidelines* – define the basic goals that authors should work toward in order to make content more accessible to users with different disabilities,
- *success criteria* – defined for each guideline and are measurable, and can be used to define the non-functional requirements of a website or web application,
- *sufficient and advisory techniques* – documented for each guideline and success criteria that are informative. The advisory techniques go beyond what is required and allow the authors to better address the guidelines.

WCAG 2.0 consists of *success criteria*, written as testable statements, independent of technology. In addition, it has general information on the interpretation of these criteria, described in separate documents, in order to make the guidelines easier to understand. This feature of the document has facilitated error reporting by automated audit tools, making them common [19].

Despite significant improvements in the approach to the topic of digital accessibility, WCAG 2.0 did not cover all the potential problems that people with disabilities could encounter [5]. For this reason, an update of the standard to version 2.1 was released in June 2018 [6]. In comparison to the previous edition, new success criteria were added for users with cognitive or learning disabilities, users with low vision and disabilities that cause difficulties in using mobile devices. In January 2023, W3C announced draft recommendations for WCAG 2.2 [24]. This new version extends WCAG 2.1 by adding new success criteria, definitions to support them, and guidelines to organize the additions. So far, it has not been approved.

16.2.2. Manual audits

Manual audits examine the structure of the website and its functionality. Tests carried out using assistive software help to show possible problems of people with disabilities using a website. Experts familiar with the problems encountered by disabled users perform audits using checklists [25]. Manual audits use tools that find errors and present them to the auditor. In many cases, these are also the tools used to carry out automated audits. The use of these programs allows experts, among other things, to quickly detect errors related to missing alternative text for hyperlinks or images, which would be very time-consuming without these tools. However, not all checkpoints may be accepted immediately, and some cases may require multiple tests to be accepted for an audit. An expert, based on his knowledge and skills, can also notice errors not detected by programs for automatic website analysis for accessibility.

Informal experiential techniques are also included in manual evaluation. In this case, the evaluation is based on the use of an interface in such a way that the sensory, motor or cognitive capabilities of the auditor are reduced. Then, scenarios of independent exploration of the site and use of its functionality are performed, and information on what was successful and what was not, is noted. Such tests can also be carried out by people with disabilities, using a 'think-aloud' protocol to verify the achievement of the intended action [2]. Through such tests, it is possible to gain a better understanding of disabled people's problems and their expectations of the site.

16.2.3. Automated audits

Automated audits are performed by special tools to analyse a website for accessibility (examples are given in Table 1). They evaluate a website based on the success criteria set out in the WCAG document. Some solutions allow for the evaluation of a single page, while others evaluate the entire content of a website. Accessibility can be examined at every step of a website's development: from design, implementation, deployment and maintenance. For this reason, various quality control solutions have been developed for designers, developers, project managers and auditors evaluating the final state of a product. Unfortunately, in some cases, the various tools may provide inaccurate results. Among other reasons, for this reason it is not advisable to use only automated tools to assess the quality of a website, but they can help with manual review [15].

There has been debate for many years on how to measure web accessibility [3]. Many studies report that web accessibility auditing tools do not cover all the success criteria defined in the WCAG. However, many of them refer to version 1.0 or 2.0 [4, 7, 19]. At the same time, many of these papers highlight the still small amount of research in that area. Taking into account the dynamics of the development of Internet technologies and the growing interest in the subject of accessibility, it is worth conducting more and more research in this area. It should also be noted that many projects from around ten years ago on accessibility evaluation tools have been abandoned. There has been a change in the W3C Consortium's approach regarding the WCAG, allowing for easier testing of success criteria [14] and new solutions have been developed. Automated audits provide a quick and easy way to obtain a report on a given web site. They often do not require the intervention of an auditor. They are therefore affordable in economic terms and are suitable for analysing a large number of websites in real time [18].

16.2.4. Tools for accessibility analysis

The tools selected for the analysis were pre-verified. The possibility of automatically auditing a website based on the criteria defined in WCAG was checked, as well as the possibility of saving the resulting report in a form that can be later processed. Tools allowing only interactive website analysis, without the possibility of a full audit and report saving, were excluded. The tools selected were not limited to free solutions. In the case of commercial applications, free trial periods were used to analyse and collect reports of pre-selected websites for examination. The selection of tools was guided by a list prepared by the W3C Consortium containing set of 167 tools [26]. The set of tools being the result of review is shown in Table 1.

Table 1

Overview of selected analysis tools

Name	Type	Revised guidelines	Subpage analysis	Form of report
Lighthouse[1]	web app, command line app, web browser extension, NodeJS module	WCAG 2.1	no	CSV JSON
Axe DevTools[2]	web browser extension	WCAG 2.0 (A, AA) WCAG 2.1 (A, AA)	no	JSON
Axe Core[3]	NodeJS module	WCAG 2.0 (A, AA) WCAG 2.1 (A, AA)	no	JSON
WAVE Web Accessibility Evaluation Tool[4]	application interface	WCAG 2.1	no	JSON
Tenon[5]	Internet platform	WCAG 2.0, 2.1	no	CSV
Ace IT[6]	Internet platform	WCAG 2.1	yes	CSV XLSX
Domain Accessibility Audit[7]	opensource web app	WCAG 2.0 (A, AA) WCAG 2.1 (A, AA)	yes	JSON

[1] https://developers.google.com/web/tools/lighthouse
[2] https://www.deque.com/axe/devtools/
[3] https://github.com/dequelabs/axe-core
[4] https://wave.webaim.org/
[5] https://tenon.io/
[6] https://ace.useit.se/
[7] https://github.com/MSU-NatSci/DomainAccessibilityAudit

continue tabl. 1

Name	Type	Revised guidelines	Subpage analysis	Form of report
IBM Equal Access Accessibility Checker[8]	web browser extension, NodeJS module	WCAG 2.0 (A, AA) WCAG 2.1 (A, AA)	no	CSV JSON
Accessibility Insights for Web[9]	web browser extension	WCAG 2.1	no	HTML

16.3. Medical Classifications

16.3.1. International Classification of Diseases

The International Classification of Diseases (ICD) is a widely use diagnostic tool. It is used for health management, clinical purposes and epidemiology. The ICD is maintained by the World Health Organisation (WHO). The ICD was originally designed as a healthcare classification system, providing a system of diagnosis codes to classify diseases and a wide range of symptoms, abnormal test results or even social circumstances and external causes of injury or illness. The document contains an accepted worldwide system of categories to which disease entities have been assigned according to established criteria. It consists of twenty-one chapters containing classification groups identified by a three-character identifier, which are further subdivided into four-character subcategories [13].

The ICD is still being developed, detailing the diseases already defined and including new ones. The latest – eleventh revision of the International Classification of Diseases (ICD-11), is almost five times as big as its previous version. In our research we only show that appropriate WCAG mappings to the ICD are possible, so we have stayed with references to the ICD-10.

[8] https://www.ibm.com/able/toolkit/tools/#verify
[9] https://accessibilityinsights.io/

16.3.2. International Classification of Functioning, Disability and Health

The International Classification of Functioning, Disability and Health, known more commonly as ICF, is a classification of health and health-related domains [12]. The structure of the ICF is based on the following components: functions and physique, activity and involvement in a life situation. In addition, it includes additional information on severity and environmental factors. At ICF, functioning and disability are seen as a complex interaction between an individual's state of health and environmental and personal factors. This classification allows for the assessment of the degree of disability, although it is not a measurement tool. This applies to all people, regardless of their state of health. ICF emphasizes function, not condition or disease. It is designed to be appropriate for different cultures, ages and genders. ICF and ICD complement each other, therefore it is recommended to use both classification systems together.

16.4. Assessment of accessibility

16.4.1. Mapping WCAG to ICD and ICF

To identify the user's personal needs, it is necessary to select which success criteria are relevant to him or her. This can be done using a hospital report indicating a diagnosed disease (ICD code) or dysfunction (ICF code). Alternatively, the indication of the specific dysfunctions for which the website should be analysed can be done by the caregiver of the person with a disability or by the person himself. For each of the success criteria described in the WCAG, the related ICD and ICF codes have been mapped. Table 2 shows an example for criteria 1.1.1 Non-text Content.

Table 2

Example of guideline mapping

Success Criterion	Conformance Level	ICD-10	ICF
1.1.1 Non-text Content	A	H52.0, H52.1, H52.2, H52.3, H52.4 H53.0, H53.1, H53.3, H53.4, H54, H54.0, H54.1, H54.2, H54.3, H54.4, H54.5, H54.6, H54.7, H59, H59.0, H59.8, H59.9, H90, H91, H93.0, H93.1, H93.2, H93.8, H93.9	b210, b2100, b2101, b2102, b2103, b2108, b2109, b230, b2300, b2301,b2302, b2303, b2304, b2400, b2408, b2409

16.4.2. Personal web content accessibility factor

The personalized assessment takes into account only the relevant success criteria for the selected user dysfunctions. The *Success Criteria Threshold* (*SCT*) threshold of a success criterion, the number of reached and unreached occurrences of a criterion will be used to determine the factor. The final measure of the accessibility of a website in relation to a given dysfunction is assessed according to strict rules. If *SCT* percentage of occurrences of a given success criterion is not met, the component obtained from this criterion is zero, otherwise the *Web Content Accessibility Factor* (*WCAF*) is calculated according to the formula (1).

$$WCAF = \frac{\sum_{j=1}^{n} \begin{cases} f_l & when\ s_j = 0 \\ \frac{a_j}{s_j} f_l & when\ s_j > 0 \end{cases}}{\sum_{k=1}^{n} f_l} \quad (1)$$

where:
f_l – factor for the success criterion level (A – 3, AA – 2, AAA – 1),
a_j – sum of cases where a success criterion is reached,
s_j – sum of all cases where the success criterion applies
n – number of success criteria analysed.

For A level, the highest multiplier value is proposed, as this level deals with the removal of the most significant barriers that prevent the use of the functionality offered by the website. The next levels received decreasing values. If a guideline is not applicable (i.e. $s_j = 0$, e.g. provision of video audio description, on non-video pages), the criterion is scored with the maximum value (3, 2 or 1, depending on its level).

16.5. Evaluation and discussion

16.5.1 Methodology

The study was designed to experimentally validate the feasibility of using automated website accessibility tools to determine the adaptation of a website to specific impairments. The experiment consisted of collecting data from *www.pacjent.gov.pl* using pre-selected tools. Due to the proposed final factor of accessibility assessment, tools were selected to include information on passed and failed success criteria in the

reports. These were: *Axe core* (version 4.2.3-alpha) and *IBM Equal Access Accessibility Checker* (version 3.1.8). These studies did not involve users, so the results were grouped according to disability groups. Based on mapping WCAG to ICD and ICF, and considering data showing the percentage of specific dysfunctions among adults in the United States of America, collected in 2016 (a sample of 458,881 people) [11], obtained results were categorized into groups of disabilities including:

a) All dysfunctions,
b) Mobility dysfunctions,
c) Cognitive disorders (memory, attention, thinking, language),
d) Disorders related to independent living (intellectual, decision-making),
e) Hearing disorders (deafness, hearing impairment),
f) Vision disability (blindness, colour blindness),
g) Reading disabilities,
h) Disorders resulted in epilepsy.

In addition, three values for the SCT parameter were also used: 100%, 90% and 80%. The SCT parameter defines the limits of the percentage of implemented instances of a given guideline relative to all possible instances of its application. The reason for examining a threshold of less than 100% is to provide an assessment of a site where a particular guideline has been omitted in a few cases, e.g. by an oversight of the developers. Values of 100%, 90%, 80% were chosen experimentally. Then, one value was selected to look at the WCAF values for different dysfunction groups.

16.5.2. Discussion of results

Table 3 shows the number of passed and failed success criteria for the selected web site. The information contained in the reports of the automated audit tools, differs depending on the tool used. In particular, this is the case for the level of detail for certain success criteria (e.g. treating each character in the content independently).

Table 3

Results of guideline application detection at *www.pacjent.gov.pl*

	IBM Checker		AxeCore		Manual audit	
Success Criterion	Passes	Fails	Passes	Fails	Passes	Fails
1.1.1	1450	2	15	0	14	14
1.3.1	1659	3	36	0	107	4

continue tabl. 3

	IBM Checker		AxeCore		Manual audit	
Success Criterion	Passes	Fails	Passes	Fails	Passes	Fails
1.3.2	646	0	0	0	1	0
1.3.3	574	0	0	0	0	0
1.3.5	1	0	1	0	1	0
1.4.1	56	0	0	0	1	0
1.4.3	721	2	120	2	49	1
1.4.4	55	0	0	0	0	0
1.4.5	0	0	0	0	10	0
1.4.10	0	0	0	0	0	0
1.4.11	0	0	0	0	212	0
1.4.12	0	0	7	0	6	0
1.4.13	0	0	0	0	0	0
2.1.1	12	0	0	0	0	0
2.2.2	35	0	0	0	0	0
2.4.1	296	4	1	0	0	0
2.4.2	2	0	1	0	2	0
2.4.4	99	0	69	0	92	3
2.4.6	23	1	0	0	0	1
2.4.7	26	0	0	1	0	1
2.4.10	0	0	0	0	3	2
2.5.3	6	1	0	0	0	1
3.1.1	1	0	2	0	2	0
3.1.2	3	0	2	0	0	0
3.2.2	5	0	0	0	0	0
3.3.2	3	0	1	0	4	0
4.1.1	21	1	26	1	9	3
4.1.2	78	2	129	2	142	4

Figure 1 shows the combined results for all separated disability groups. This means that all success criteria contained in the WCAG 2.1 document were taken into account. In the graph it can be seen that as the SCT parameter decreases the results increase, this is the expected result. A value of 100% means that there can be no omission of a possible success criterion. Lower values (90% and 80%) mean that, despite the occurrence of minor faults (no application of the expected success criterion), the criterion is taken into account when calculating the WCAF. The similar results obtained for 80% and 90% led to the decision to drop the analyses for the 80% value later in the study.

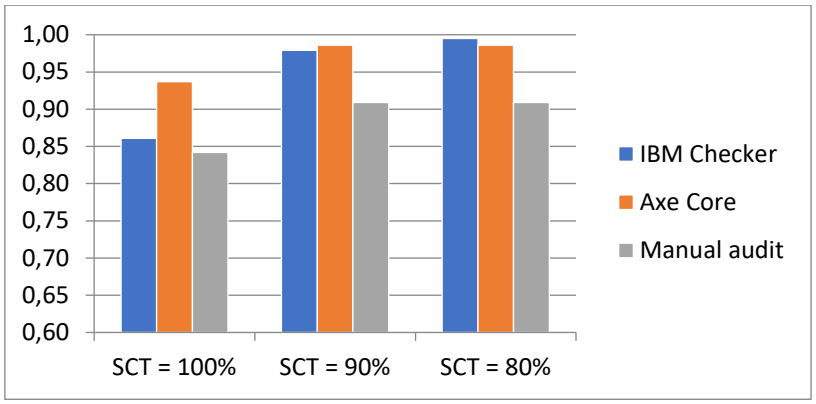

Fig. 1. Value of WCAF for all success criteria depending on SCT
Rys. 1. Wartość WCAF dla wszystkich kryteriów sukcesu w zależności od SCT

A significant difference can be seen between the results obtained using the IBM Checker tool and the manual audit. The difference reaches up to 0.2 of the WCAF. The Axe Core tool gives results similar to those of the manual audit for SCT = 100%, and more similar to the first tool for SCT = 90%. Then, the results were collected together according to the previously defined disability groups and the value of the SCT parameter. Figure 2 illustrates the values obtained for SCT = 100% and Figure 3 for SCT = 90%.

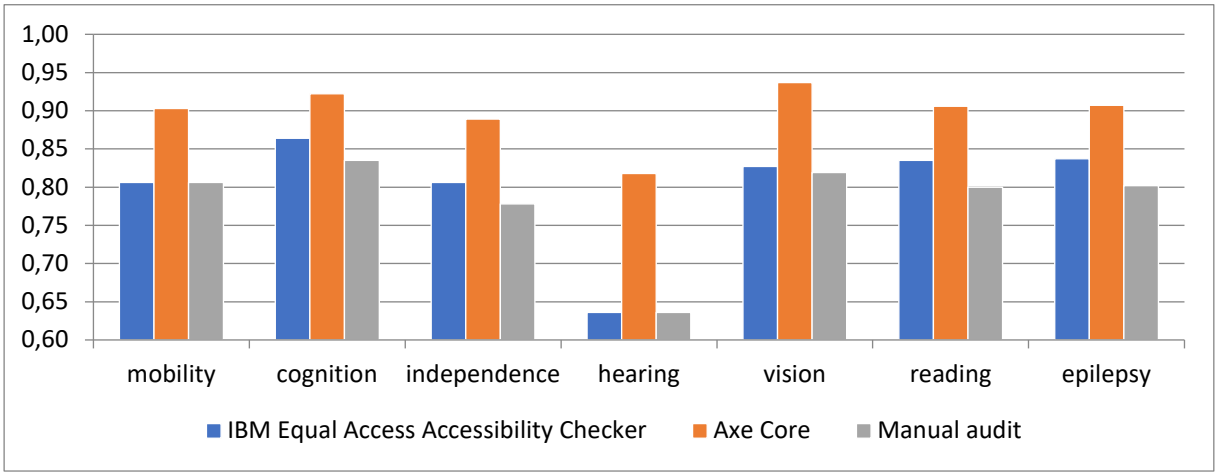

Fig. 2. Value of WCAF for different dysfunction groups (SCT=100%)
Rys. 2. Wartość WCAF dla różnych grup dysfunkcji (SCT=100%)

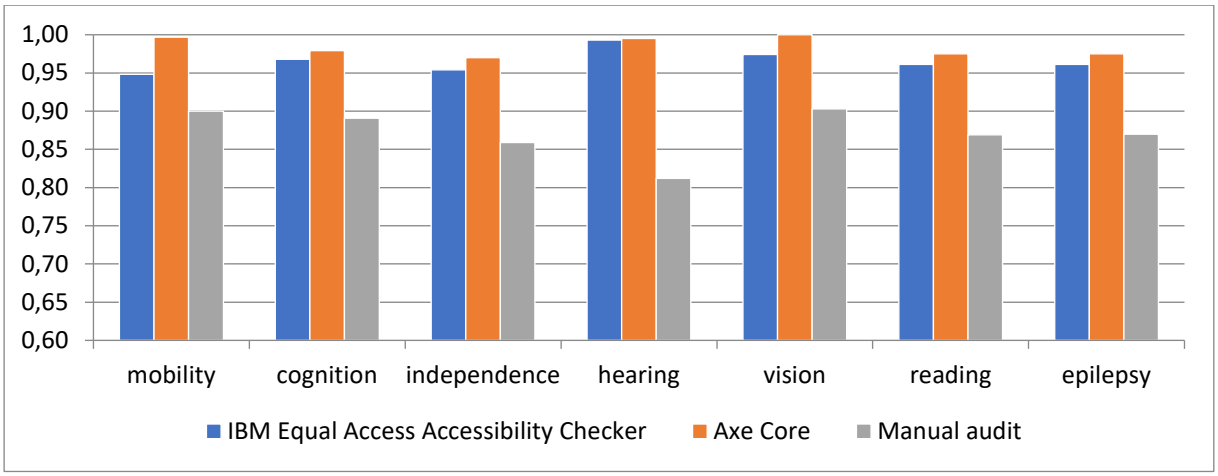

Fig. 3. Value of WCAF for different dysfunction groups (SCT=90%)
Rys. 3. Wartość WCAF dla różnych grup dysfunkcji (SCT=90%)

Although the determined WCAF values are different for the disability groups, as in the summary chart, the correlations between the audit methods are similar. The best value of the r-Pearson correlation coefficient was calculated for the AxeCore tool and the manual audit: 0.972 (SCT = 100%). The results obtained with the AxeCore tool are characterized by high values, which is particularly noticeable for SCT = 100%. This is a result of many small elements of the website (e.g. individual characters) being recognised as correct, and are therefore a very high percentage of all elements verified. IBM Equal Access Accessibility Checker gave results similar to manual audits for SCT = 100%, and the results w0ere similar to those of the AxeCore tool for SCT = 90%. The WCAF for manual audits has always been the lowest, which may mean that they were the most rigorous, although certainly the most time-consuming.

16.6. Conclusions

In the study, we described how to make a personalized assessment of website accessibility. First, we chose people with special needs as the target group. The main government patient website (*www.pacjent.gov.pl*) was chosen as the source material. It was then assumed that all guidelines defined in the WCAG do not need to be taken into account for a personalized assessment. A description of the user's personal deficits given in the form of a list according to the ICD or ICF can be used to select guidelines. However, it should be noted that the ICF seems to be more appropriate as it relates directly to functioning and disability. In the next step, a method for calculating the accessibility index is proposed in order to present the assessment numerically. Finally,

the WCAF values for the different disability groups and the two SCT threshold values were calculated. Although we did not involve users, we showed that, depending on personal needs, using mainly the ICF to WCAG mapping, we are able to select which guidelines should be assessed.

An observation resulting from the research is that automated testing does not give a complete view of a page's accessibility due to the number of cases requiring contextual assessment of elements. However, it is a quick and easy way to verify whether a page will be accessible at all to a person with special needs. A site evaluated positively by automatic tools may therefore meet the basic criteria, breaking down the most difficult barriers for people with impairments, but a high automatic audit score does not ensure a comfortable use of the site, for which an expert audit is needed. Thus, tools allowing automatic web accessibility audits can be used for initial verification, but cannot be fully relied upon, due to the different ways of validation and the incomplete coverage of verification of success criteria.

Bibliography

1. A. Arch. Web accessibility for older users. *Proceedings of the 2009 International Cross-Disciplinary Conference on Web Accessibility* (W4A) – W4A '09, ACM Press (2009) 1–6.
2. S. Schmutz, A. Sonderegger, J. Sauer. Implementing recommendations from web accessibility guidelines. Human Factors: *The Journal of the Human Factors and Ergonomics Society* (2016), 58(4):611–629.
3. S.L. Henry, S. Abou-Zahra, J. Brewer. The role of accessibility in a universal web. *Proceedings of the 11th Web for All Conference on – W4A '14*. ACM Press (2014) 1–4.
4. International Organization for Standardization, ISO 9241-11:2018 Ergonomics of human-system interaction – part 11: Usability: Definitions and concepts, https://www.iso.org/standard/63500.html, [access: 30.01.2023].
5. T. Frazão, C. Duarte. Comparing accessibility evaluation plug-ins. *Proceedings of the 17th International Web for All Conference*. ACM (2020) 1–11.
6. J. Brewer. Web accessibility highlights and trends. *Proceedings of the international cross-disciplinary workshop on Web accessibility – W4A*. ACM Press (2004) 51–55.
7. D. Sloan, A. Heath, F. Hamilton, B. Kelly, H. Petrie, L. Phipps. Contextual web accessibility – maximizing the benefit of accessibility guidelines. *Proceedings of the 2006 international cross-disciplinary workshop on Web accessibility (W4A) Building the mobile web: rediscovering accessibility? – W4A*, ACM Press (2006) 121–131.

8. M. Vigo, J. Brown, V. Conway. Benchmarking web accessibility evaluation tools. *Proceedings of the 10th International Cross-Disciplinary Conference on Web Accessibility – W4A '13,* ACM Press (2013) 1–10.
9. R. Calvo, F. Seyedarabi, A. Savva. Beyond web content accessibility guidelines. *Proceedings of the 7th International Conference on Software Development and Technologies for Enhancing Accessibility and Fighting Infoexclusion*, ACM (2016) 77–84.
10. World WideWeb Consortium. Web Content Accessibility Guidelines (WCAG) 2.1. https://www.w3.org/TR/WCAG21/ [access: 30.01.2023].
11. G. Brajnik. A comparative test of web accessibility evaluation methods. *Proceedings of the 10th international ACM SIGACCESS conference on Computers and accessibility – Assets '08*, ACM Press (2008) 113–120.
12. L. Keen S. Abou-Zahra, N. Steenhout. Selecting web accessibility evaluation tools, https://www.w3.org/wai/test-evaluate/tools/selecting/. [access: 03.07.2021].
13. G. Brajnik, A. Mulas, C. Pitton. Effects of sampling methods on web accessibility evaluations. *Proceedings of the 9th international ACM SIGACCESS conference on Computers and accessibility – Assets '07*, ACM Press (2007) 59–66.
14. M. Cooper, Q. Limbourg, C. Mariage. Integrating universal design into a global approach for managing very large web sites, http://ui4all.ics.forth.gr/ui4all-99/cooper.pdf. [access: 30.01.2023].
15. C. Power, A. Freire, H. Petrie, David Swallow. Guidelines are only half of the story. *Proceedings of the SIGCHI Conference on Human Factors in Computing Systems*. ACM (2012) 433–442.
16. M. Vigo, G. Brajnik. Automatic web accessibility metrics: Where we are and where we can go. *Interacting with Computers* (2011) 23(2):137–155.
17. World Health Organization. International Statistical Classification of Diseases and Related Health Problems 10th Revision. https://icd.who.int/browse10/2019/en [access: 22.03.2023]
18. World Health Organization. ICF. International classification of functioning, disability and health. https://icd.who.int/dev11/l-icf/en [access: 22.03.2023]
19. C. Okoro, N. Hollis, A. Cyrus, S. Griffin-Blake. Prevalence of disabilities and health care access by disability status and type among adults – united states, 2016. *Morbidity and Mortality Weekly Report* (2018) 67(32):882–887.
20. World Wide Web Consortium. Essential Components of Web Accessibility. https://www.w3.org/WAI/fundamentals/components/ [access: 10.01.2023].
21. World Wide Web Consortium. User Agent Accessibility Guidelines (UAAG) Overview. https://www.w3.org/WAI/standards-guidelines/uaag/ [access: 10.01.2023].

22. World Wide Web Consortium. Authoring Tool Accessibility Guidelines (ATAG) Overview. https://www.w3.org/WAI/standards-guidelines/atag/ [access: 10.01.2023].
23. World Wide Web Consortium. W3C Process Document. https://www.w3.org/2004/02/Process-20040205/tr.html [access: 10.01.2023].
24. World Wide Web Consortium. Web Content Accessibility Guidelines (WCAG) 2.2. https://www.w3.org/TR/WCAG22/ [access: 10.01.2023].
25. World Wide Web Consortium. WCAG-EM Report Tool. https://www.w3.org/WAI/eval/report-tool/ [access: 10.01.2023].
26. World Wide Web Consortium. Web Accessibility Evaluation Tools List. https://www.w3.org/WAI/ER/tools/ [access: 10.01.2023].

PERSONALIZED ASSESSMENT OF WEB CONTENT ACCESSIBILITY FOR PEOPLE WITH SPECIAL NEEDS

Abstract

In the study, we described how to make a personalized assessment of website accessibility. First, we chose people with special needs as the target group. The main government patient website (*www.pacjent.gov.pl*) was chosen as the source material. It was then assumed that all guidelines defined in the WCAG do not need to be taken into account for a personalized assessment. A description of the user's personal deficits given in the form of a list according to the ICD or ICF can be used to select guidelines. However, it should be noted that the ICF seems to be more appropriate as it relates directly to functioning and disability. In the next step, a method for calculating the accessibility index is proposed in order to present the assessment numerically. Finally, the WCAF values for the different disability groups and the two SCT threshold values were calculated. Although we did not involve users, we showed that, depending on personal needs, using mainly the ICF to WCAG mapping, we are able to select which guidelines should be assessed.

Keywords: accessibility, assessment, personalization, web