ASSESSING THE WEB ACCESSIBILITY COMPLIANCE OF MUNICIPALITY WEBSITES IN ALBANIA WITH WCAG 2.2 STANDARDS

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Abstract

Web accessibility refers to the equal use of web platforms among persons with and without disability. Accessibility is considered a human right, and the European Union, along with many other countries, has implemented mandatory regulations to guarantee that government websites and applications meet accessibility standards. This paper examines the accessibility of municipality's websites in Albania. The authors have used AccessibilityChecker as an evaluation tool to explore whether the websites comply with Web Content Accessibility Guidelines (WCAG) 2.2. The results show that average accessibility score was evaluated at 60.58, a notable difference from 85, the threshold where websites are considered partly compliant. All the websites have prevalent critical issues that make them less accessible, difficult to use, and create barriers for people with visual, hearing, mobility, and cognitive impairments. This study is significant to public officials, advocacy groups, policymakers, website developers, and other stakeholders in understanding the current state of accessibility across local government websites and creating solutions that ensure equitable access to information and services and promote inclusive design.

Key words**:** *Web accessibility, disability, municipalities, Albania, WCAG 2.2, inclusivity.*

Përmbledhje

Aksesueshmëria në Web i referohet përdorimit të barabartë të platformave të internetit midis personave me dhe pa aftësi të kufizuara. Aksesueshmëria konsiderohet një e drejtë dhe Bashkimi Evropian, së bashku me shumë vende të tjera, ka zbatuar rregullore të detyrueshme për të garantuar që faqet e internetit dhe aplikacionet qeveritare të përmbushin standardet e aksesueshmërisë. Ky punim shqyrton aksesueshmërinë e faqeve web të

bashkive në Shqipëri. Autorët kanë përdorur AccessibilityChecker si një mjet vlerësimi për të eksploruar nëse faqet e internetit përputhen me Udhëzimet për Aksesueshmërinë e Përmbajtjes së Web-it (WCAG) 2.2. Rezultatet tregojnë se vlerësimi mesatar i aksesueshmërisë është 60.58, me një diferencë të dukshme nga 85, pragu ku faqet e internetit konsiderohen pjesërisht të pajtueshme. Të gjitha faqet web kanë problematika kritike që i bëjnë ato më pak të aksesueshme, të vështira për t'u përdorur dhe krijojnë pengesa për njerëzit me dëmtime vizuale, dëgjimi, lëvizshmërie dhe njohëse. Ky studim është i rëndësishëm për zyrtarët publikë, grupet e interesit, politikëbërësit, zhvilluesit e faqeve të internetit dhe palët e tjera të interesuara për të kuptuar gjendjen aktuale të aksesueshmërisë në faqet web të qeverisjes vendore dhe krijimin e zgjidhjeve që sigurojnë akses të barabartë në informacion dhe shërbime, si dhe promovojnë dizajnin gjithëpërfshirës.

Fjalë kyçe: *Aksesueshmëria në Web, aftësia e kufizuar, bashkitë, Shqipëri, WCAG 2.2, përfshirja.*

Introduction

Web Accessibility is concerned with the use of websites, applications, and other digital products by disabled people. It implies that people with limitations should use the web equally to those without them. For many disabled people who have vision impairment, hearing difficulties, cognitive abilities, or other limitations, web information remains inaccessible or difficult to understand, which creates barriers to making informed choices, participating in community life, and more. Thus, web accessibility refers to creating websites, tools, and technologies that disabled people can perceive, understand, navigate, operate, and contribute to the web. In that regard, the World Wide Web Consortium (W3C) has created standards such as the Web Content Accessibility Guidelines (WCAG), to address the needs of disabled persons and make websites and other digital products more accessible. (W3C, 2024).

According to the World Health Organization (WHO), around 16% of the population experiences a permanent or temporary disability, with the number continuing to increase due to the aging of the population. (WHO, n.d.) In Albania, the results from Cens 2023 for population and household, conducted by the National Institute of Statistics (INSTAT) and published in 2024, indicate that disability in the population over five years old is 6.5%. 59.5% of them are over 65 years old, reiterating the association between older age and disability. Among the disabled population, 14,8% are illiterate. The difference

between the general values reported by WHO and those provided by INSTAT may come because disability was measured along six core functional domains: seeing, hearing, walking or climbing stairs, cognition, daily self-care, and communication. The respondent was classified as a disabled person if reported 'A lot of difficulty' or 'Cannot do at all' to at least one of the six functioning questions (INSTAT, 2024, pp. 124-126). The total number of difficulties reported is 302 480, an average of 2 difficulties for a disabled person. (INSTAT, 2024, p. 86).

The Convention on the Rights of Persons with Disabilities (CRPD), designed and developed by the United Nations (UN), underscores the need for institutions to facilitate access for disabled persons to new information and communication technologies (United Nations, 2006). Since 2016, the EU has also implemented mandatory regulations for all its member states that guarantee accessibility to government websites and applications (EU, 2016).

Albania also ratified the convention in 2012 as a first step in creating a significant base of strategic documents that address the needs of disabled persons (Republic of Albania, 2012). Law nr. 93/2014, titled 'For the inclusion and accessibility of persons with disabilities', states that government policies, as one of the elements for independent living, should support disabled persons in having access to communication and information, as well as providing them with the necessary means to achieve this goal (Republic of Albania, 2014). The National Plan for Persons with Disabilities 2021-2025 recognizes the accessibility to information as one of three core components of accessibility. (Ministry of Health and Social Protection, 2021, p. 17).

However, studies on web accessibility in Albania and their compliance with accessibility standards remain scarce and unexplored in the academic literature. Moreover, empirical research focused on the accessibility of e-government systems or the official websites of public institutions in Albania is limited. The authors have evaluated the official websites of municipalities in Albania to determine whether they adhere to the guidelines and recommendations of WCAG 2.2.

This study has positive implications and could serve a variety of stakeholders, such as municipal public officials, policymakers, disability organizations and other advocacy groups, legal experts, website designers, developers, citizens, and researchers. It raises awareness of the current state of accessibility across local government websites in Albania, encouraging officials to take measures to create inclusive services and ensure quality access to these services and

information. Moreover, this study offers information on common errors based on standards and best practices, helping developers create inclusive websites.

The paper continues with a literature review on related research, evaluation types, the need for websites to be accessible, and WCAG guidelines. It then describes the research methodology and proceeds to discuss the results, focusing on accessibility scores, common errors, and how to solve them. The study ends with limitations, future work, and concluding remarks.

Related literature

The Web Content Accessibility Guidelines, developed by W3C, offer a set of guidelines and recommendations for web accessibility that primarily help web content developers, web authoring tool developers, and web accessibility tool developers. They also provide a common standard to address the requirements of organizations, governments, and individuals regarding web accessibility (W3C, 2024). The guidelines are grouped around four fundamental principles: perceivable, operable, understandable, and robust. The first principle, perceivable, ensures that users can identify content and interface elements successfully. Operability refers to interacting with elements such as buttons, menus, links, and other controls. Understandable means that users can easily comprehend the content and how the page works or appears. Lastly, the robust principle highlights the need for accessible elements to accommodate a range of devices and assistive technologies (W3C, 2023).

The necessity of web accessibility has been acknowledged by many countries around the world that have ratified the CRDP and, since then, passed legislation and regulations on how websites should be designed for easy use by disabled people. However, even though the legislation is a factor and has a positive effect on improvements in accessibility, there is still a lot to be done to make web content more accessible, and other means are needed to raise awareness on this issue (Kešelj et al., 2021). A study conducted on the Hungarian government institutions' websites showed that none of them adhered to the WCAG recommendations regarding accessibility while meeting only the basic requirements of usability (Csontos & Heckl, 2020). Brazil is a country that has dedicated a lot of effort and resources to accessibility, such as developing appropriate legislation, creating its own accessibility models like e-MAG, and building evaluation tools. Nevertheless, despite the progress made, its government websites' overall compliance score

remains low (Oliveira et al., 2020). Independent studies in Saudi Arabia and Ecuador also indicate that government websites have significant problems that create barriers for people with disability to access them and fail to fully comply with accessibility guidelines (Al-Sakran & Alsudairi, 2021) (Sanchez-Gordon et al., 2020).

Another study conducted in Norway evaluating the accessibility of municipal websites found that none of the websites passed the accessibility test. Compliance with robust and perceivable principles appeared to be more problematic, and common violations included very low contrast, non-text content, empty buttons, missing form labels, link purpose, and more (Inal et al., 2022). Similar results were found in a cross-country analysis of G7 and BRICS countries, where most of the government websites were non-compliant with WCAG guidelines. The robust principle resulted in the most significant number of problems and the understandable principle the least, which indicated a lack of proper design to run on different devices. The study noted that the reason for noncompliance could come due to the lack of awareness of the guidelines or the fact that there are no mandatory regulations to comply with. (Kesswani & Kumar, 2022)

Compliance with accessibility standards is also essential because browsers like Google Chrome have integrated many features supporting accessibility, like access to screen readers, live captions, full page zoom, font adjustments, and increased compatibility with various assistive technologies (Accessibility.com, 2022). Google Chrome has a very different flow for users who use screen readers. It detects when an assistive technology is used, and presents the website based on the accessibility tree, a modified and a simplified version of the DOM (Document Object Model) tree. (Google, 2016).

Automated testing, expert inspection, and user evaluation could all be used to evaluate websites if they adhere to the accessibility standards. Although automated evaluation tools are fast and efficient, they still cannot detect all website issues and provide only an overall score regarding accessibility compliance. Expert inspections are usually used to identify problems that automated tools have not found or list as issues needing manual audits. However, this kind of inspection requires significant time and resources. User evaluations are considered the most effective because they are based on real user experiences and usually can identify relevant accessibility problems overlooked by the other two methods. Nevertheless, if the user's familiarity with assistive technologies is not at the right level, the outcomes of the

evaluations could be affected (Mateus et al., 2021).

Methodology

The authors analysed the official websites of municipalities using test criteria from WCAG 2.2 guidelines to determine the overall level of compliance of websites, identify the main errors, and understand how these errors impact disabled people. The authors focused only on municipality websites as nearly all government services have migrated to the E-Albania platform developed by NAIS, which has taken many initiatives towards unification and standardization. Meanwhile, each local government website maintains a unique design and delivers information and services for its local population.

There are 61 municipalities in Albania, meaning there is a population of 61 official municipality websites. Since there is a finite population, using the modified Cochran formula (Cochran, 1977) with a confidence level of 90% and a margin of error of 10%, the sampling size, rounded up to the upper value, is 33. To choose which website to evaluate, the authors used the judgmental sampling technique, which means selecting elements based on special characteristics (Taherdoost, 2016). The authors initially selected the official websites of the 33 largest municipalities, determined by total population, to evaluate the websites that serve the most people.

According to the Census 2023, in these municipalities live 2 120 963 persons, or approximately 88,3% of the population (INSTAT, 2024, pp. 66-67). However, the websites of Tirana, Patos, and Malësi e Madhe municipality could not be loaded by the tool selected for testing, probably due to the implementation of firewall or antispam services. These websites were replaced by the websites of municipalities next in the list, Mat, Belsh, and Peqin. In the final selection, the number of people who live in these municipalities is 1,533,984, or approximately 63,9% of the population. 63,7% of the total population of people over 15 also live in the final set of the municipalities. The removed websites were tested with other tools provided in the WCAG tool list, and the same results and problems were identified. Nevertheless, the results from these three municipalities are not included in the dataset created for the study.

For the evaluation, the authors utilized the AccessibilityChecker online tool (AccessibilityChecker, n.d.), which is included in the tool list provided by the W3C and, at the time of writing, is the most recently updated tool on the list.

AccessibilityChecker detects web accessibility issues and provides instructions on how to fix them (W3C, n.d.). It assesses websites for compliance with WCAG 2.2 guidelines, the latest standard published by the W3C, in October 2023. The tool analyzes only the URL given and not the subpages of the website. For each of the official websites, the authors entered only the homepage, as it is the page that usually has the most content and interactive elements, and also where the navigation further in the website starts.

The tool runs automated testing on the webpage based on predefined test criteria from WCAG 2.2 guidelines and accessibility best practices. It scans the website's structure, the missing alt text from images, the contrast of website colors, label problems on buttons and links, ARIA attributes on elements, and more. After the scan, it provides a list of the unique[1] critical issues - errors that need to be attended to immediately, passed audits - the elements that are implemented correctly based on the recommendation, required manual audits - issues that need another look by an accessibility expert, for example, access keys or custom controls, and not applicable - accessibility test cases that could not be applied to the given page because they are not applicable, for example, video caption checks could not be applied if the page does not contain any video.

The tool also calculates the accessibility score, a number between 1 and 100, sometimes displayed as a percentage where 100% means to be fully compliant. AccessibilityChecker categorizes websites as Compliant if they score 100, partly compliant if they score higher than 85, and not compliant if they score less than 85 (Accessibility Checker, 2024). The aggregated results of the study are discussed in the following chapter.

Data analysis and results

A. Compliance Rate

The authors analyzed 33 official websites of the local municipalities with the accessibilitychekcer.org online tool. The results from scanning the 33 selected

[1] The tool identifies distinctive critical issues. For example, the page could have five different links without a description and three images without alt text. The tool summarizes these as two unique critical issues rather than eight.

websites are presented in Table 1. As indicated from the result, none of the websites comply with the WCAG 2.2 guidelines, showing a low level of accessibility to the information and services presented, making them difficult to use and creating barriers for people with disability.

Further analysis show that the mean accessibility score is 60.58, a notable difference from the minimum value to be partly compliant. This value is very close to the average accessibility score of European websites. A study conducted by AccessibilityChecker organization, using the same tool, showed that Europe has an average accessibility score of 62 from 100. Other regions of the world have similar values on average, except for Asian countries, which scored 52 on aggregate (Accessibility Checker, 2024). The similarity in the values of compliance may come due to the use of similar frameworks for developing websites, and the low value could be related to the absence of mandatory laws and regulations on accessibility.

The minimum and maximum scores are 39 and 73, respectively, and the standard deviation is 9.47, which shows a variability in accessibility scores among websites. The range of the accessibility score is 34, which again indicates how spread the dataset is. The first quartile is 57, the median is 64, and the third quartile is 67. These metrics show that values are left-skewed or negatively skewed, which suggests that most websites have a relatively high accessibility score, but the average score is pulled down by extreme website scores like 39 and 42.

Table 1. Accessibility score of municipalities official websites. The table summarizes the accessibility assessment of 33 selected municipal websites, listing each municipality and its homepage URL. The table includes the accessibility score (maximum 100), compliance status, number of detected errors, number of passed audits, number of audits requiring manual checks, and cases deemed not applicable.

Nr.	Municipality	Homepage URL	Accessibility Score	Complience	Errors	Passed Audits	Require Manual Audits	Not Aplicable
1	Durrës	https://durres.gov.al/	63	Not Compliant	5	21	10	31
2	Elbasan	https://elbasani.gov.al/	64	Not Compliant	4	27	10	26
3	Shkodër	https://bashkiashkoder.gov.al/	67	Not Compliant	4	25	10	28
4	Fier	https://bashkiafier.gov.al/	45	Not Compliant	7	16	10	34
5	Kamëz	https://kamza.gov.al/	49	Not Compliant	9	22	10	26
6	Vlorë	https://vlora.gov.al/	72	Not Compliant	3	21	10	34
7	Lushnje	https://bashkialushnje.gov.al/	73	Not Compliant	3	24	10	31
8	Berat	https://bashkiaberat.gov.al/	56	Not Compliant	4	16	10	37
9	Korçë	https://bashkiakorce.gov.al/site/	39	Not Compliant	7	14	10	36
10	Lezhë	https://lezha.gov.al/	65	Not Compliant	3	18	10	36
11	Krujë	https://kruja.gov.al/	58	Not Compliant	5	15	10	38
12	Dibër	http://dibra.gov.al/	60	Not Compliant	3	14	10	40
13	Pogradec	https://www.bashkiapogradec.gov.al/	42	Not Compliant	6	9	10	42
14	Kukës	https://kukesi.gov.al/	39	Not Compliant	11	19	10	27
15	Kurbin	https://www.bashkiakurbin.gov.al/	64	Not Compliant	5	23	10	29
16	Kuçovë	https://bashkiakucove.gov.al/	68	Not Compliant	4	25	10	28
17	Maliq	https://bashkiamaliq.gov.al/	59	Not Compliant	8	26	10	24
18	Kavajë	https://kavajajone.al/	57	Not Compliant	6	22	10	29
19	Dimal	https://bashkiadimal.gov.al/	71	Not Compliant	3	22	10	33
20	Bulqizë	https://bulqiza.gov.al/	67	Not Compliant	5	26	10	27
21	Devoll	https://www.bashkiadevoll.gov.al/	68	Not Compliant	4	21	10	33
22	Cërrik	https://www.bashkiacerrik.gov.al/	65	Not Compliant	5	25	10	27
23	Divjakë	https://www.bashkiadivjake.gov.al/	67	Not Compliant	5	27	10	26
24	Librazhd	https://bashkialibrazhd.gov.al/	67	Not Compliant	3	19	10	35
25	Gjirokastër	https://bashkiagjirokaster.gov.al/	70	Not Compliant	3	25	10	29
26	Sarandë	https://bashkiasarande.gov.al/	63	Not Compliant	5	25	10	27
27	Shijak	https://www.shijak.gov.al/	69	Not Compliant	4	24	10	30
28	Vorë	https://bashkiavore.gov.al/	66	Not Compliant	3	19	10	35
29	Vau I Dejës	https://www.vaudejes.gov.al/	50	Not Compliant	4	12	10	41
30	Prrenjas	https://www.bashkiaprrenjas.gov.al/home/	68	Not Compliant	4	26	10	27
31	Mat	https://bashkiamat.gov.al/	58	Not Compliant	5	22	10	30
32	Belsh	https://bashkiabelsh.al/	53	Not Compliant	7	25	10	25
33	Peqin	https://peqini.gov.al/	57	Not Compliant	4	14	10	39

Source: Data provided by AccessibilityChecker scan, Processed by Authors

B. Critical Issues

The number of unique critical issues or errors found on the tested websites was 4.9 per website, while passed audits were 21 per website. Around 93% of errors found came from testing criteria from WCAG 2.2 guidelines, while around 7% resulted from accessibility best practices. For each of the issues under WCAG 2.2, the tool also listed the intended level of compliance (Level A or Level AA). In the summary audits, the issue "Ensures the order of headings is semantically correct" is not listed as required by WCAG 2.2 but from Accessibility Best Practices. However, the recommendation is also part of the WCAG 2.2 guidelines and has been present since the earlier standards WCAG 2.0 and WCAG 2.1. It falls under success criterion 1.3.1: info and relationships (Level A) (W3C, 2024).

The same goes for "A user is not able to freeze GIFs and other moving objects," which is part of success criterion 2.2.2: pause, stop, hide (Level A) (W3C, 2024). In the following analysis, these two issues were considered part of WCAG 2.2. Meanwhile, "Ensure image alternative is not repeated as text," which occurs only once, even though it could be implied by the success criteria 1.1.1: non-text content (Level A) was excluded from the analysis because it was not clearly specified (W3C, 2024).

Overall, 70,6% were issues related to Level A accessibility, while 29,4% were related to Level AA accessibility. Level A addresses the basic Level of accessibility, and related issues to this level are the most critical to accessing web content. Compliance examples include images with alternative text, keyboard navigation for web elements, and no content movement or flashes to prevent seizures.

For a website to be considered accessible, it should comply with these Level A requirements. Level AA refers to mid-range accessibility, where the majority of users can access and use the website. Examples include consistent structure, correctly labeled forms, clear headings, and appropriate contrast ratio (W3C, 2024). A summary of all critical issues found on evaluated pages and their number of occurrences are presented in Table 2.

Table 2. Critical Issues. The table lists all the accessibility issues identified during the assessment of municipal websites, along with the number of occurrences for each one, the associated accessibility principles, and the relevant Web Content Accessibility Guidelines (WCAG) success criteria.

Critical Issues	**Nr. Occurrence**	**Principle**	**Success Criterion**
Ensures links have discernible text	33	Operable	SC 2.4.4
Ensures the contrast between foreground and background colors meets WCAG 2 AA minimum contrast ratio thresholds	31	Perceivable	SC 1.4.3
Ensures <iframe> and <frame> elements have an accessible name	16	Robust	SC 4.1.2
Ensures the order of headings is semantically correct	11	Perceivable	SC 1.3.1
Ensure touch target have sufficient size and space	10	Operable	SC 2.5.8
A user is not able to freeze GIFs and other moving objects	9	Operable	SC 2.2.2
Ensure links are distinguished from surrounding text in a way that does not rely on color	8	Perceivable	SC 1.4.1
Ensures elements with an ARIA role that require child roles contain them	7	Robust	SC 4.1.2
Ensures <meta name = "viewport"> does not disable text scaling and zooming	6	Perceivable	SC 1.4.4

Ensures buttons have discernible text	5	Robust	SC 4.1.2
Ensures <img> elements have alternate text or a role of none or presentation	5	Perceivable	SC 1.1.1
Ensures aria-hidden elements are not focusable nor contain focusable elements	3	Operable & Robust	SC 2.4.3 & SC 4.1.2
Ensures every ARIA button, link and menuitem has an accessible name	3	Robust	SC 4.1.2
Ensures every ARIA input field has an accessible name	3	Robust	SC 4.1.2
Ensures every form element has a label	2	Understandable	SC 3.3.2
Ensures every HTML document has a lang attribute	2	Understandable	SC 3.1.1
Ensures elements with an ARIA role that require parent roles are contained by them	2	Robust	SC 4.1.2
Ensures that lists are structured correctly	1	Perceivable	SC 1.3.1
Ensures <dl> elements are structured correctly	1	Perceivable	SC 1.3.1
Ensures elements are used semantically	1	Perceivable	SC 1.3.1
Ensures all ARIA attributes have valid values	1	Robust	SC 4.1.2

Source: Data provided by AccessibilityChecker scan, Own processing & categorization

C. Affected Disability and Best Practices

Each of the above issues impacts a number of disabilities that, include visual impairments, hearing impairments, and mobility impairments as the more frequent, together with neurological and cognitive impairments which are less frequent. Figure 1 shows the number of times a distinct disability is related to a critical issue found on the website's homepage.

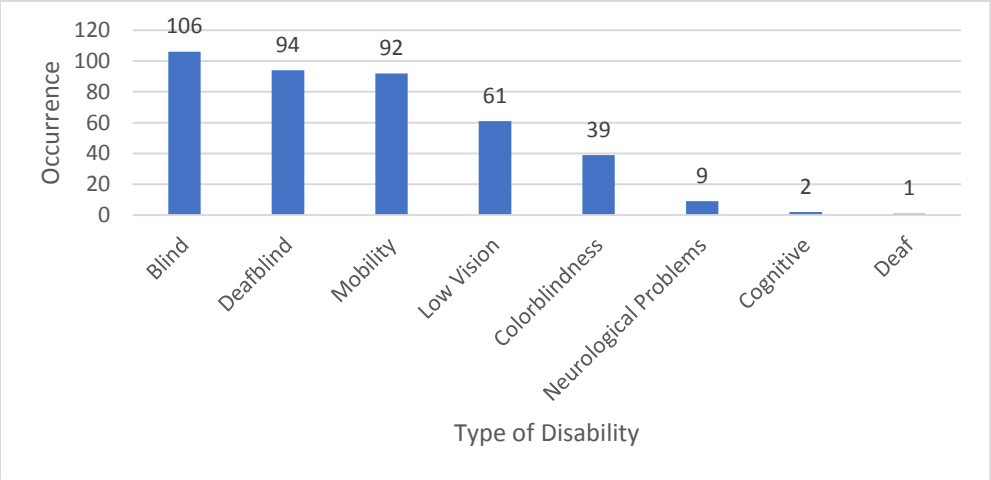
The type of disability was determined by the AccessibilityChecker tool.

Errors related to visual impairments such as total blindness, low vision, or color blindness affect users who interact using assistive technologies like screen readers or need high-contrast visual content or features. Errors related to hearing impairment disabilities affect users who use technologies like speech-to-text or, in the case of deafblind users, braille-based assistive technologies. Issues related to mobility impairment affect users who need keyboard navigation or alternative input methods. Issues regarding cognitive impairment or other neurological problems are less frequent, but their existence could affect users who find it hard to focus due to nonpredictable website structure or may experience seizures in case of flash and moving objects on the screen.

The authors categorized the errors based on the principle they affect. The categorization was solely based on criteria from the WCAG 2.2 guidelines, and no other standard was taken into consideration (W3C, 2024). Table 2 also shows that the Perceivable and Robust principles accounted for eight unique errors, followed by Operable with four unique errors each and Understandable with two. Figure 2 illustrates the total number of errors found across websites for each principle, with the Perceivable, Operable and Robust principles showing the highest number of errors.

Issues with the Perceivable principle indicate that parts of the site's content are difficult to access, and people with disabilities struggle to perceive the information. Problems with the operable principle suggest that users have trouble navigating and interacting with websites, particularly through assistive technologies or keyboards. Finally, issues with the robust principle show that content is not compatible with assistive technologies, making it hard to interpret. When these principles are significantly affected, it can lead to user frustration, abandonment of the site, and, more importantly, exclusions of people with disabilities from crucial information that the local government conveys through their website.

Figure 1. Number of times a distinct disability is related to a critical issue. A critical issue could affect one or more disability at the same time.

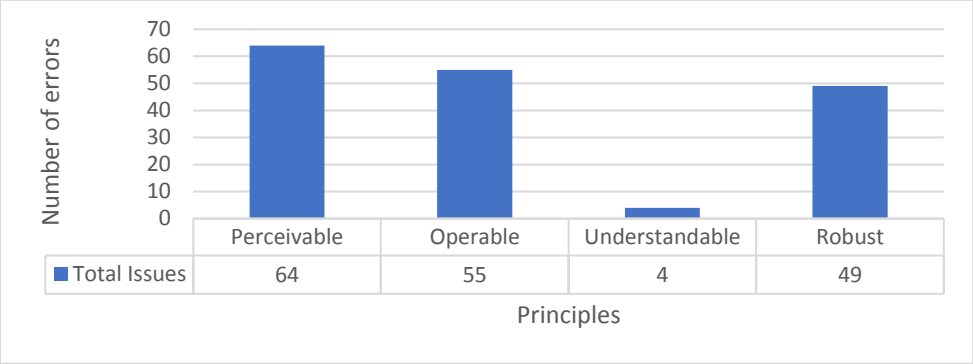


Source: Data provided by AccessibilityChecker scan, Own processing and visualization

As recommended by the audit reports that AccessibilityChecker provides with each scan, the link should include a short description that conveys information about the destination. For people who use screen readers, link descriptions like “here” or “link” will not have any contextual meaning. Low contrast ratio is another problem that affects people with visual impairment or colorblindness who are not able to read characters with a low-contrast ratio or distinguish specific colors in a picture.

Following the recommendation of WCAG, the minimum color contrast ratios for all text should be 3:1 for text that is 18 pt, or 14 pt and bold, and 4.5:1 for all other text. People who rely on assistive technologies need unique and descriptive title attributes for all frame and iframe elements; otherwise, it will confuse users when navigating between the frames.

Figure 2. Number of errors for each WCAG principle



Source: Data provided by AccessibilityChecker scan, Own processing and visualization

Furthermore, the heading structure should logically represent the structure of the website, and the heading text should deliver the content of that specific section because screen readers have commands that jump between heading sections. Touch targets should also have space between them to allow the user to interact correctly.

They should be at least 24x24 CSS pixels in size and not intersect with other targets. Certain types of content that display movements, like gifs, could affect photosensitive people. This type of content should either be removed or be provided with a feature to stop the moving parts. Moreover, images should have descriptive alt attributes to help people use screen readers to access content that is displayed visually.

Limitations and future work

AccessibilityChecker tool gives an overall accessibility score based on automation testing on predefined checks by WCAG 2.2 guidelines. It also summarizes the most critical issues, what disability category they affect, and how they can be resolved. This study provides an excellent starting point for disability organizations, policymakers, municipality mayors, web designers, and developers regarding the accessibility compliance of official municipality websites.

As the above results come from analysing data provided by an automation testing tool, future studies on the topic could focus more on accessibility expert

inspections or user evaluation. This would provide more detailed analyses and clearly define the compliance score. The study was focused only on analysing the homepage of each website, as indicated also by the large number of not-applicable tests. Further analyses should be made on inner pages to get an aggregate result for the whole website. For this paper, the authors focused only on official local municipality websites. In the future, the study could be expanded to all government websites, centralized platforms like e-Albania, business-owned websites, e-commerce websites, and more to thoroughly understand the accessibility level across many domains. Finally, time-based research could be conducted to study the evolution of accessibility regulations and compliance in Albania.

Conclusion

The authors studied the web accessibility compliance with WCAG guidelines of municipalities' official websites in Albania. Out of 61 municipalities' websites, a sample of 33 was selected based on a 90% confidence level and 10% margin of error. The websites were evaluated using the AcessibilityChecker tool, an automated testing tool suggested by W3C. The evaluation was made against WCAG 2.2 guidelines, which is the most recent published update. The evaluation was solely based on criteria from the WCAG 2.2 guidelines, and no other standard was considered.

The results showed that none of the Albanian websites comply with WCAG 2.2. standard. The average accessibility score was evaluated at 60.58, a notable difference from 85, the threshold where websites are considered partly compliant. The number of errors was 4,9 per page. 70,6% of the issues were related to Level A accessibility and 29,4% to Level AA accessibility.

The issues found affect people who are visually impaired, hearing impaired, mobility impaired, or have neurological or cognitive impairments. Among the four principles of WCAG guidelines, the perceivable, operable and robust principles accounted for most of the errors. The results show that Albanian municipality's websites have many accessibility problems, which pose many challenges to disabled people accessing the content, thus creating barriers and potentially excluding them from critical information published by the local government.

This study could help raise awareness of the state of web accessibility in Albania and encourage developers, policymakers, accessibility advocates, and public officials to further improve the websites and other digital products in

order to accommodate the needs of disabled people. To address these problems, institutions and other stakeholders should conduct periodic accessibility audits and provide staff training on accessibility standards. Furthermore, as technology changes, regular updates on web design are needed to comply with WCAG guidelines.

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