

Accessibility of Ethiopian First Generation Public University Websites

Gezahegn Mulusew Delele^{1*}, Gizatie Desalegn Taye², Moges Tsegaw Melesse³

¹Department of Information Technology, Debre Tabor University, Debre Tabor, Ethiopia

²Department of Computer Sciences, Debre Tabor University, Debre Tabor, Ethiopia

³Department of Computer Sciences, Debre Tabor University, Debre Tabor, Ethiopia

Corresponding author: moges.dtu@gmail.com

Abstract. This paper assesses the level of web availability offered by the advanced education establishment of the Ethiopian 1st generation public university websites. The accessibility of website evaluation was done by using the automatic website evaluation tool AChecker. Based on the World Wide Web Consortium (W3C) evaluation standards and Web content Accessibility guidelines 1.0 (WCAG 1.0) and 2.0 (WCAG 2.0) with different levels such as level A, AA, and AAA. The outcomes of the website accessibility evaluation show no university websites meet the minimum requirements of website accessibility except Hawassa university's website.

Keywords:- Website accessibility, Public University, Ethiopian 1st generation

1. Introduction

Currently, the web becomes an important part of our day-to-day life to make life easier by using different web technologies, and the web technologies are enhanced rapidly to meet the interest of the users or stakeholders. Due to the current situation (COVID19), or other reasons university stakeholders use the web extremely to access important information whether academic or non-academic issues [7]. Concerning the above advantages, it's common to deliver university services by using websites and the students also use websites to get different services such as registration, access to their grades, and other related activities.

Individuals with handicaps have similar requirements as non-handicapped individuals in utilizing the web. University assets counting on the web administrations ought to be accommodated to every individual with no segregation. Lamentably, individuals with handicaps are not ordinarily considered as a customary web client bunch by the vast majority of the web engineers and consequently don't give any thought to their necessities in web planning measures. The web engineers and university administrators must be touchy about the online administrations' convenience that will facilitate the existence of individuals with incapacities.

At this time, a vital instrument is to gather the information and disseminate it to the intended stakeholders like students, teachers, administrators, and other staff of the university. In addition to this, websites are a very important medium to reach the students without any physical distance limitations by using different ways of communication devices [11]. However, the designer and

developer of websites should be highly emphasized, to make the university websites for all students with different types of disabilities and without disabilities because every student has equal rights to accessing the websites to gain all the necessary information. Due to the above reasons, we are intended to evaluate Ethiopian First Generation Public University Websites. After we evaluate the university websites we determined which one is accessible for all types of users with disabilities and without disabilities. And this paper is an input to all the evaluated universities because based on the output we gained they can redesign and redevelop the websites and make them accessible. to evaluate the websites we used W3C such as WCAG 2.0, UAAG 2, and ATAG 2.0[8].

2. Methodology

As the examination goal characterized in the main part of the investigation is to assess the accessibility of Ethiopian university sites. Along these lines, the examination technique is recognized and chosen as relevant for the exploration targets. Subsequently, a quantitative examination technique was used to decipher and investigate the outcomes that got from the assessment of the Ethiopian university sites' on-premise line of web openness rules. Since, this examination strategy communicates the information in numbers and finishes or breaks down the outcomes, fundamental to explicitly gauge the issues and appropriate to show the outcomes in table structure, diagram, and chart (Rahi, 2017). I utilized this examination technique to direct the web availability assessment and address the finding of the investigation as indicated by the outcomes produced by the programmed assessment apparatuses. In addition, quantitative exploration techniques, and subjective examination strategies were used to assess the sites as indicated by the web availability strategy and rules. Accordingly, this amounts strategy is significant to the active nature of web availability understanding to the conformance of the web openness and utilized for availability assessment of the sites on the gauge of W3C rules[5].

2.1 Identification and Selection of Ethiopian University Website

Ethiopian universities use sites to offer assistance and resources to the residents effectively in various areas for instruction, the executives, social and so forth Estimating the openness of the sites is fundamental to affirm it is available to individuals or not. Therefore, choosing to lead the exploration of university sites offers support at the national level. These sites are overseen and controlled by university service levels and office levels. There are 42 universities in Ethiopia and they are categorized into three categories. They are categorized based on the year of launch, therefore, first-generation, second generation, third generation, and fourth generation[10]. Hence, 9 universities were selected for this research because when the year of launch differs the infrastructure is also different that is why I have selected the only first-generation university as a target group and the name of the university and website address are listed in table 1.

Table 1: List of Selected University Name and Website Address

No	Name of University	Website Address
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1	Adiss Ababa	www.aau.edu.et
2	Bahirdar	www.bdu.edu.et
3	University of Gondar	www.uog.edu.et
4	Adama Sciences and Technology	www.astu.edu.et
5	Hawassa	www.hu.edu.et
6	Mekelle	www.mu.edu.et
7	Haramaya	www.haramaya.edu.et
8	Arba Minch	www.amu.edu.et
9	Jimma	www.ju.edu.et

2.2 Selection of Accessibility Testing Tool

The determination of mechanized testing instruments contrasts from one to the other analyst that depends on individual intrigued and highlights of these devices. A few of the WCAG guidelines can as they were being checked by a human. Robotized evaluation devices can offer assistance to distinguish potential issues but can't check all availability angles.

There are diverse automatic web assessment apparatuses that have diverse functions and features. Each organization, web designer/developer/content author, venture, and the group has differing needs for different features to require under consideration when selecting an assessment tool. Several tools are available on the world wide web to analyze web accessibility assessment instruments [9, 6]. In this work, AChecker [1] was utilized previously in a few inquiries chosen to assess the web availability of Ethiopian university websites' homepages.

These instruments named AChecker [1], are too assessed by themselves and in each other to check their domestic page openness. In this think about websites assessed with WCAG 2.0 and Level AA examination level alternatives of these apparatuses. AChecker is an open-source web openness assessment system planned by Comprehensive Plan Inquire about Center, which was at first known as Versatile Innovation Asset Center. You can assess availability by entering a URL or by uploading an HTML file. AChecker gives choice for choosing openness rules such as follows WCAG 2.0 in level (A, AA, AAA) and WCAG 1.0 in level (A, AA, AAA) and you can organize the report as per your requirements[8]. The outcomes of the evaluation tool are recognized as Likely problems, Potential problems, and Known problems.

3. Research Results

In this section, the results of the Ethiopian public university websites that were tested automatically with an automatic evaluation tool were given. Figures 1,2,3, 4,5, and 6 show the numerical data obtained from the evaluation of Ethiopian public university websites with AChecker. The testing results of the Ethiopian government websites with AChecker are shown below Figures. the total problems found in Ethiopian public universities' websites were identified based on the guideline numbers found by, AChecker. The testing results of the evaluation tool are organized and shown in the figure below.

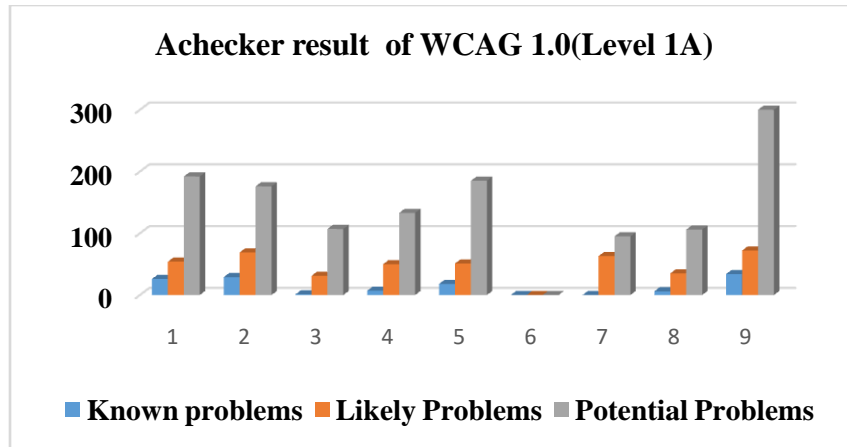


Figure. 1 Known, Likely, and Potential problems results of Achecker WCAG 1.0(Level 1A) test.

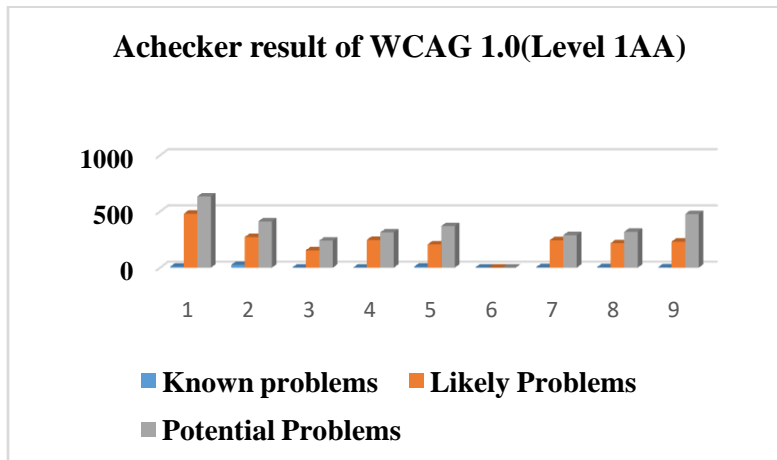


Figure.2 Known, Likely, and Potential problems results of Achecker WCAG 1.0(Level 1AA) test.

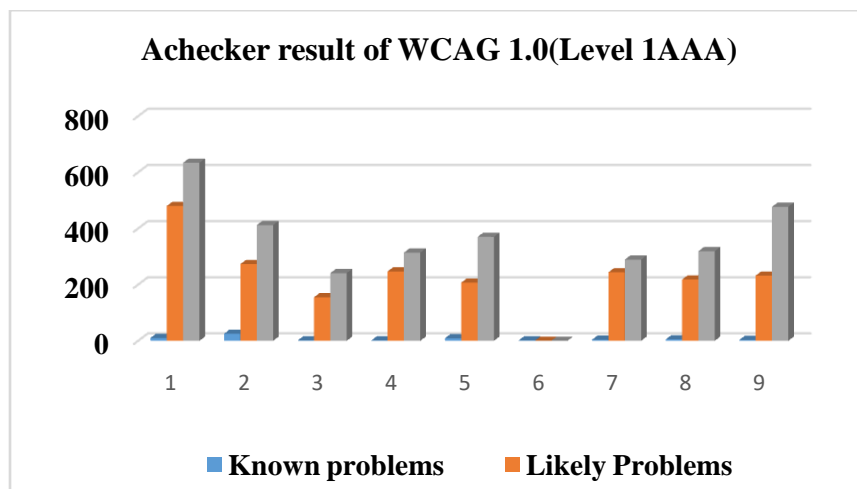


Figure3 Known, Likely and Potential problems results of Achecker WCAG 1.0(Level 1AAA) test.

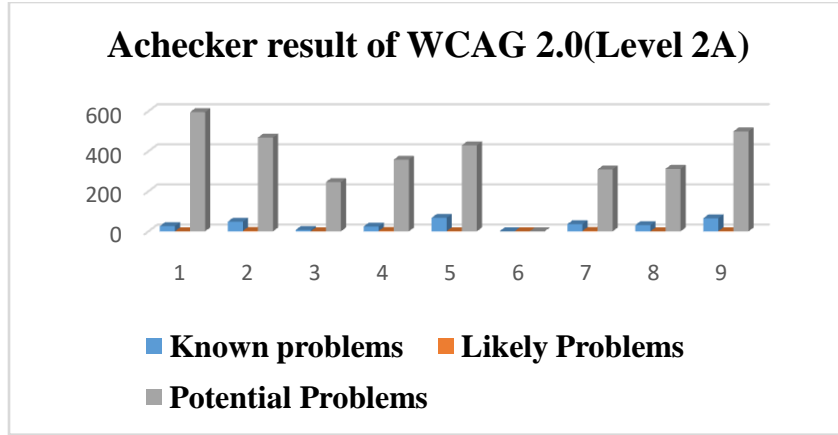


Figure4 Known, Likely and Potential problems results of Achecker WCAG 2.0(Level 1A) test.

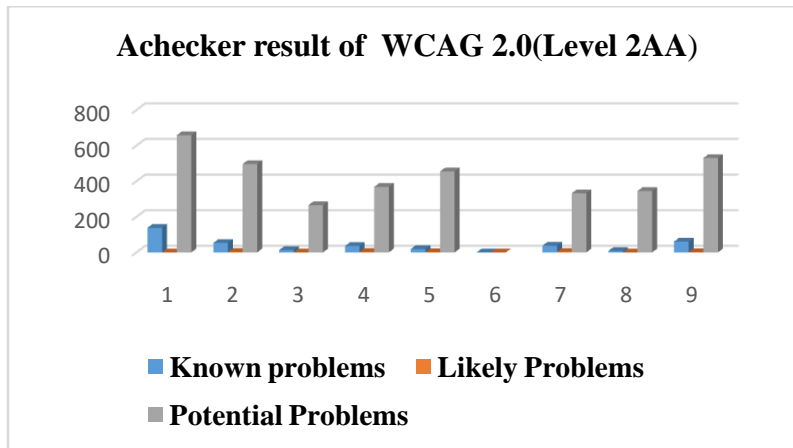


Figure. 5 Known, Likely and Potential problems results of Achecker WCAG 2.0(Level 1AA) test.

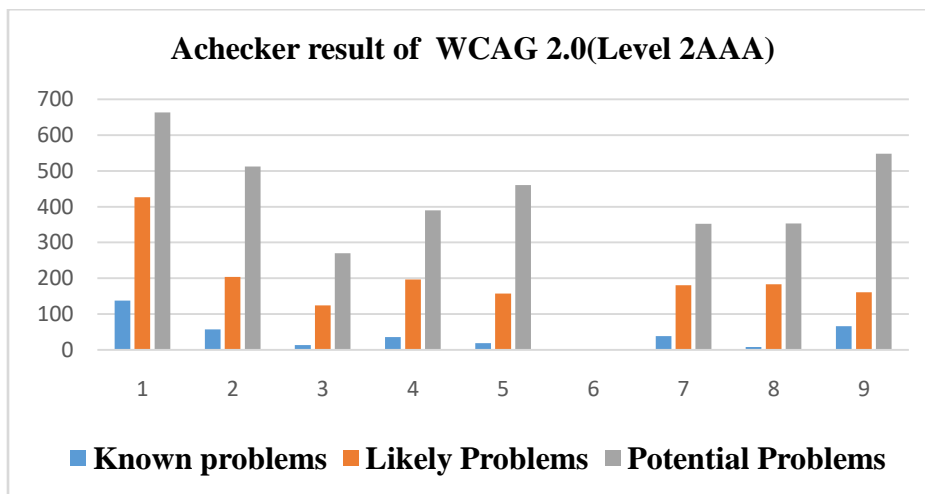


Figure. 6 Known, Likely, and Potential problems results of Achecker WCAG 2.0(Level 1AAA) test.

4. Discussion

None of the sites meets the base prerequisite of website availability conformance rules and no site was identified as mistake-free as per the AChecker automatic evaluation results. According to the evaluation results generated from AChecker, the Hawassa university website meets the requirements based on the guidelines of Web Content Accessibility Guidelines(WCAG). On the other side, Adama Sciences and Technology university website does not meet the requirements based on the guidelines of Web Content Accessibility Guidelines(WCAG). Because when I was evaluating the accessibility of the Adama Sciences and Technology university website by AChecker, it generates more than 100 Known problems, Likely Problems, and Potential Problems. The other university websites' accessibility result lies between higher accessibility Hawassa university website result and lower accessibility result Adama Sciences and Technology university website.

5. Conclusion

This investigation pointed toward making mindfulness about the level of accessibility of the Ethiopian higher education 1st generation public organization websites dependent on the global principles. All recorded sites bombed one or more tests dependent on WCAG 2.0 Level A,AA, AAA rules. Indeed, even the most essential standard requirements of individuals with incapacities that are recognized by the AChecker are not met. All sites overall are not agreeably open by individuals with disabilities. Specialized rules and the utilization of site availability tests are simply used to assist with distinguishing the issues for the web designers. University heads and site engineers should offer the need to plan web pages as per the norms recorded in WCAG 2.0 rules during their site advancement system. There ought to be some association of individuals with incapacities themselves in plan and testing interaction to guarantee that they have the right access highlights on the sites. Ethiopian 1st generation higher education public organization websites should be accessible and role models for the other 2nd, 3rd,4th and private universities.

References

- [1] Achecker website. Retrieved from <http://achecker.ca>
- [2] Arasid, W., Abdullah, A. G., Wahyudin, D., Abdullah, C. U., Widiaty, I., Zakaria, D., Amelia, N., & Juhana, A. (2018). An Analysis of Website Accessibility in Higher Education in Indonesia Based on WCAG 2.0 Guidelines. IOP Conference Series: Materials Science and Engineering, 306, 012130. <https://doi.org/10.1088/1757-899x/306/1/012130>
- [3] Aizpurua, A., Arrue, M., Vigo, M., & Abascal, J. (2011). Validating the effectiveness of EvalAccess when deploying WCAG 2.0 tests. Universal Access in the Information Society, 10(4), 425–441. <https://doi.org/10.1007/s10209-011-0226-z>
- [4] Greg Gay,Cindy Qi Li. (2010). AChecker: Open, Interactive, Customizable, Web Accessibility Checking. International World Wide Web Conference.
- [5] Information technology. W3C Web Content Accessibility Guidelines (WCAG) 2.0. (n.d.). <https://doi.org/10.3403/30255561>

- [6] J. Lopez-Zambrano, J. Moreira-Pico and N. Alava-Cagua, “Methodology to evaluate and classify web accessibility evaluation tools,” *E-Ciencias de la Información* 8(1), pp.172-189, 2018. DOI:10.15517/eci.v8i1.30012.
- [7] Lin, Y. (2020, September 28). 10 Internet Statistics Every Marketer Should Know in 2020 [Infographic]. Retrieved November 12, 2020, from <https://www.oberlo.com/blog/internet-statistics>.
- [8] Web Accessibility Initiative (WAI) website. Retrieved from <https://www.w3.org/WAI>
- [9] V.L. Centeno, C.D. Kloos, J.A. Fisteus and L.A. Á lvarez, “Web Accessibility Evaluation Tools: A Survey and Some Improvements,” *Electronic Notes in Theoretical Computer Science* 157(2), pp.87-100, 2006. DOI:10.1016/j.entcs.2005.12.048.
- [10] Wikimedia Foundation. (2020, December 14). List of public higher institutions in Ethiopia. Wikipedia. https://en.wikipedia.org/wiki/List_of_public_higher_institutions_in_Ethiopia.
- [11] Fathema, N., Ross, M., & Witte, M. M. (2014). Student acceptance of university web portals. *International Journal of Web Portals*, 6(2), 42–58. <https://doi.org/10.4018/ijwp.2014040104>