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The Accessibility Diagnosis on Jordan E-Government Website

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ABSTRACT

The aim of this paper is to evaluate Jordan E-Government website from the accessibility perspective. An evaluation was made to diagnose the website accessibility using online-automated tool named TAW to provide in-depth technical direction on HTML issues relating to accessibility. The results showed significant issues and the website lacks accessibility. Therefore, the website needs further improvements to improve its quality in order to make this website accessible to everyone including people with certain disabilities.

Key words: Accessibility, WCAG 2.0, E-Government, TAW.

1. INTRODUCTION

The web is playing a major role in diverse application domains such as business, education, industry and entertainment. Thus, it is essential that the Web be accessible in order to provide equal access and equal opportunity to people with disabilities. According to W3C [1] Web accessibility means that people with disabilities can perceive, understand, navigate, and interact with the Web, and that they can contribute to the Web. Developing a website should pass through several design guidelines to ensure that the website can achieve the purposes and goals intended to be accomplished such as usability and accessibility.

The Government of Jordan's national e-Government initiative, launched by His Majesty King Abdullah II, aims to drive the nation's transformation into a knowledge society founded on a competitive, dynamic economy. Jordan remains committed to this national vision [2]. As part of its efforts to transform its society, economy and government, Jordan is pursuing a national e-Government strategy that one of its aims is to deliver high-quality services to consumers, businesses and organizations; this can be accomplished by delivering an accessible e-Government website.

As more accessible Web sites and software become available, people with disabilities are able to use and contribute to the Web more effectively. Evaluating accessibility of websites can help designers and developers to improve their websites based on the results of the evaluation.

Here, an evaluation was conducted using TAW tool to observe if there is significant issues in the website accessibility. This could give a light indication about the accessibility condition of Jordan E-Government website. In addition, the evaluation reveals the awareness about accessibility issue when designing their websites. In this paper, we checked the conformance to WCAG 2.0

2. WCAG 2.0

The World Wide Web Consortium (W3C, 2016) is an international community that aims to develop Web standards. In 1997, W3C launched the Web Accessibility Initiative (WAI) with endorsement by the White House and W3C members to increase awareness of web accessibility issues. WAI has developed a set of universal guidelines for Web development which are Web Content Accessibility Guidelines (WCAG 1.0 and WCAG 2.0). The WCAG 1.0 was published and became a W3C recommendation in 1999; it was superseded by WCAG 2.0 in 2008. The difference between WCAG 1.0 and 2.0 is the basis for determining conformance to the guidelines. While the basis for determining conformance to WCAG 1.0 is the checkpoints, it is the success criteria (SCs) for WCAG 2.0.

WCAG 2.0 is organized around four design principles that provide the foundation for web accessibility

(perceivable, operable, understandable, and robust) [3]. Under these principles there are 12 guidelines. Each guideline has one or more testable success criteria (SCs). There are 61 SCs at levels A (lowest), AA (medium), and AAA (highest). Table I demonstrates the WCAG 2.0 conformance levels. Other optimization techniques can be used [7-13].

Table 1: WCAG 2.0 conformance levels

Conforman ce Level	Explanation
A	All SCs of level A are satisfied. This is the "minimum standard" which a website must meet to be considered accessible for any significant disability groups.
AA	All SCs of Level A and AA are satisfied. This is a "professional practice standard", which a website should meet to be accessible to a broad range of disability groups.
AAA	All SCs (at all conformance levels) are satisfied. This is a "gold standard" of maximum accessibility which some websites may choose.

3.AUTOMATED EVALUATION TOOL

An automatic evaluation tool plays a major role in assisting developers to evaluate websites for accessibility and help determine if a Web site meets accessibility guidelines. An automatic evaluation tool can help in finding certain types of design difficulties, such as pages that will load slowly, missing links, use of jargon, potential accessibility problems, and other problems. Many tools were suggested by W3C [4], yielding different results with different levels of quality [5].

TAW [6] – Test de Accesibilidad Web, was developed by the CTIC Centro Tecnólogico (Spain). It is available as standalone multiplatform software, web-based application for checking online and as Firefox add-on. TAW uses WCAG 2.0 and its own set of heuristics for mobile accessibility as a reference. This tool supports three languages, namely English, Spanish and Catalan. TAW allows the user to select the priority level he/she wants to meet then submit the webpage URL for evaluation. The discovered accessibility violations (barriers) are listed along with their frequencies and priority level.

4.FINDINGS

In 19th March, 2019 we checked the accessibility for the homepage of E-Government (https://jordan.gov.jo/wps/portal/Home#/) using TAW tool. Table II illustrates the violations to WCAG 2.0 conformance levels. The results indicate 325 problems, which found in 11 different success criteria. Moreover, 1535 warnings were raised and need human review. The majority of problems due to (4.1.1) success criterion violation. This means, major HTML errors were detected by the tool like start and end tags that are missing a critical character in their formation were found, such as a closing angle bracket or a mismatched attribute value quotation mark are not complete. Furthermore, many problems were found relating to priority level (A) which is the minimum standard. For example, 41 violations to (1.1.1) was reported due to the absence of   text alternative for many non-text content that serves the equivalent purpose. WCAG 2.0's emphasis on perfect score on all SCs for a level to get the level conformance logo, which makes Jordan E-Government homepage not accessible at all because it does not meet priority level (A).

Table 2: TAW violations report

Guideline	Level	Problems	Warnings
Perceivable			
1.1 Text Alternative			
1.1.1 Non Text Content	A	41	79
1.3 Adaptable			
1.3.1 Info and Relationships	A	31	57
1.3.2 Meaningful Sequence	A	0	3
1.4 Distinguishable			
1.4.4 Resize Text	AA	0	1242
Operable			
2.1 Keyboard Accessible			
2.1.1 Keyboard	A	0	1
2.1.3 Keyboard (No Exception)	AAA	1	0
2.4 Navigable			
2.4.1 Bypass Blocks	A	0	6
2.4.2 Page Titled	A	0	1
2.4.4 Link	A	35	38

Purpose (In Context)			
2.4.6 Headings and Labels	AA	0	25
2.4.9 Link Purpose (link Only)	AAA	38	0
2.4.10 Section Headings	AAA	6	0
Understandable			
3.1 Readable			
3.1.1 Language of Page	A	1	0
3.2 Predictable			
3.2.2 On Input	A	2	0
3.2.5 Change on Request	AAA	0	23
3.3 Input Assistance			
3.3.1 Error Identification	A	0	6
3.3.2 Labels or Instructions	A	19	0
3.3.3 Error Suggestions	AA	0	3
3.3.4 Error Prevention (Legal, Financial, Data)	AA	0	9
3.3.5 Help	AAA	0	3
3.3.6 Error Prevention (All)	AAA	0	3
Robust			
4.1 Compatible			
4.1.1 Parsing	A	130	36
4.1.2 Name, Role, Value	A	21	0

5.CONCLUSION

Web accessibility is one of the most crucial issues facing the online community. This article has evaluated Jordan E-Government website. The website is inaccessible and thus an improvement is needed to increase the accessibility level. A total collaboration between web team, stakeholders, individual industries and countries is essential to ensure equality and human rights in using the web without illegal discrimination. We suggest the need for accessibility legislation enforcement by countries rather than following voluntary guidelines. In addition, a

project manager has the responsibility to make his web team adhere to accessibility principles. Without a managerial impact on accessibility, it is quite normal for the web team to ignore the accessibility issue or to pretend they have taken care of it. We also need to train and change the web team mind-set regarding how they code to take into consideration the accessibility issue when they program.

REFERENCES

1. W3C/WAI. Retrieved 15 March 2019, from http://www.w3.org/WAI/intro/accessibility.php.

2. N. AbuAli, A. Obedidat, and H. Abuaddous. **Accessibility as an Indicator of Jordanian E-Government Website Quality,** *Fourth International Conference on eLearning Best Practices in Management, Design and Development of eCourses:Standards of Excellence and Creativity*. Manama, Bahrain: IEEE Computer Society, Washington, DC, USA, .2013, p. 156-160.

3. WCAG 2.0*.* **Web Content Accessibility Guidelines (WCAG) Overview,** 2008, Retrieved 12March 2019, from < http://www.w3.org/TR/WCAG20/>.

4. W3C/WAI. 2005. Retrieved 16 February 2019, from http://www.w3.org/WAI/RC/tools/complete.

5. S. Abou-Zahra. (2008). *Web accessibility evaluation*. In Web Accessibility: A Foundation for Research 1st Ed., pp. 79–106. S. Harper and Y. Yesilada, Eds., Human-Computer Interaction Series, Springer, 2008, ISBN 978-1-84800-049-0.
   https://doi.org/10.1007/978-1-84800-050-6_7

6. TAW Tool. 2019. <http://www.tawdis.net/>. accessed : 3 February 2019. K. Elissa, "Title of paper if known," unpublished.

7. Abualigah, L. M. Q. (2019). Feature selection and enhanced krill herd algorithm for text document clustering. Berlin: Springer.

8. Abualigah, L. M., Khader, A. T., & Hanandeh, E. S. (2019). Modified Krill Herd Algorithm for Global Numerical Optimization Problems. In Advances in Nature-Inspired Computing and Applications (pp. 205-221). Springer, Cham.
   https://doi.org/10.1007/978-3-319-96451-5_9

9. Abualigah, L. M., & Khader, A. T. (2017). Unsupervised text feature selection technique based on hybrid particle swarm optimization algorithm with genetic operators for the text clustering. The Journal of Supercomputing, 73(11), 4773-4795.

10. Abualigah, L. M., Khader, A. T., Hanandeh, E. S., & Gandomi, A. H. (2017). A novel hybridization strategy for krill herd algorithm applied to clustering techniques. Applied Soft Computing, 60, 423-435.
https://doi.org/10.1016/j.asoc.2017.06.059

11. Abualigah, L. M., Khader, A. T., & Hanandeh, E. S. (2018). Hybrid clustering analysis using improved krill herd algorithm. Applied Intelligence, 48(11), 4047-4071.

12. Abualigah, L. M., Khader, A. T., & Hanandeh, E. S. (2018). A new feature selection method to improve the document clustering using particle swarm optimization algorithm. Journal of Computational Science, 25, 456-466.

13. Abualigah, L. M., Khader, A. T., & Hanandeh, E. S. (2018). A combination of objective functions and hybrid Krill herd algorithm for text document clustering analysis. Engineering Applications of Artificial Intelligence, 73, 111-125
https://doi.org/10.1016/j.engappai.2018.05.003