

Evaluating Accessibility of Jordanian E-Government Websites for People with Disabilities

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Abstract:

This research evaluates the accessibility of major E-government Websites in Jordan by people with disabilities with conformance to Web Content Accessibility Guidelines (WCAG) 1.0. The evaluation is conducted using two methods, namely automatic testing tools and manual checking of target Websites. Twenty five Websites representing ministries and other agencies of Jordanian government, such as Ministry of Agriculture, Ministry of Water and Irrigation, Ministry of Transport ...etc. are used for evaluation. Results showed that all tested Websites did not address the issue of disability-accessibility and they have many Web accessibility problems. Therefore, they are violating the e-government standard which says that all citizens must have equal accessible opportunities to all e-government recourses.

Keywords-component; Web Accessibility; E-governement; WCAG.

INTRODUCTION:

The rapid development of World Wide Web increases the number of online users, causing many governments around the world to take advantage of facilities offered by the Internet. They used these facilities to provide public with electronic services under what is called e-governments. On the other hand, the availability of internet technology changed the way people communicate and work as well as the process in which they obtain information. Nevertheless, the introduction of e-government faced many problems, not only for small countries but even in developed ones, where everything is available for such development [1].

E-government can be viewed as the use of emerging Information and Communication Technology Services like World Wide Web, Internet and mobile phones to deliver information and services to citizens and businesses [2]. Also, e-government can be defined as an internet driven activity that

improves people's access to government services, information and expertise to ensure that they participate in, and satisfied with the government process [3]. The adopted definition of e-government in Jordanian initiative is the ability to submit governmental transactions on-line and make payments electronically where they are required [4].

Availability and accessibility are two main and crucial requirements for e-governments to succeed [5]. Therefore e-government Websites must be equally accessible and available to all citizens. But, what about people with disabilities? Disability is permanent or temporary restrictions that affect some people and prevent them from the proper usage of sight, sound or motor skills. People with disabilities have the right to gain access to e-government resources without obstacles. In Jordan, the total numbers of disabled citizens is 54,747 overall in 2004 [6].

This research assess the accessibility of a number of Jordanian e-government Websites for people with disabilities using two methods, automatic testing tools and manual checking of target Websites.

RELATED WORKS:

Many studies have been conducted in the field of Web accessibility. These studies used different techniques and different measures for assessing the accessibility of different Websites, especially the government ones. Also these studies found that large percentage of Websites have serious problems in their accessibility. In this section we briefly mention some work that has been done in the field of Web accessibility.

Choudrie et al. [7] investigated the problem of global e-government Websites evaluation using Web diagnostic tools. Their methodology was based on two important considerations, the Web diagnostic tool and the choice of portals. The authors used only one Web diagnostic tool namely WebXact, which is

based on priority 1, 2 and 3 Accessibility problems. They examined the national Web portals of a selected number of countries such as Singapore, Finland, Canada, Hong Kong and Australia. Results showed that the two portals of Canada and Hong Kong ranked the best, with both portals have no priority1 errors. In addition, Canada's portal had no priority3 errors. On the other hand, all remaining portals have one priority1 error.

The accessibility of Chinese's local government Websites was addressed in [8]. The Author examined 339 Websites to check out how they are accessible with respect to the WCAG published by the World Wide Web Consortium (W3C). The free Bobby online service is used for evaluation under Mozilla Firefox 1.0 or Internet Explorer 6.0. Results showed that only 324 Websites were accessed by both browsers, 14 are inaccessible by both browsers and only one appeared to be under construction. The author reassessed the 15 Websites that were either inaccessible or under construction to check them again, but no changes were found. Finally, none of the 324 accessible Websites provide a text only version to homepages.

Potter [9] addressed Alabama government Websites accessibility, a Websites that encompasses a broad range of state government services and organizations. Watchfire Bobby 4.0.1 was used to collect Website accessibility data. Bobby's evaluations are based on two accessibility standards: the W3C's Web Accessibility Initiative (WAI) and Section 508. After Potter conducted the experiments, he evaluated each site for conformance to WAI standards and Section 508 as reflected in the Bobby automated test. As indicated, 19% of the evaluated sites rated conformance level A, and 16% achieved section 508 approvals as measured by Bobby.

Abanumy et al. [5] evaluated e-government Website accessibility for two Arabian countries namely; Saudi Arabia and Oman depending on general accessibility guidelines and following the Web content accessibility guidelines (WCAG). The process of evaluation was divided into five stages where a tool called MultiWeb was used. Results showed that all of the Websites failed inaccessibility tests.

New Zealand's governmental Websites were addressed in [10] in terms of providing equivalent and appropriate accessibility to information to all people. Examining 52 Websites; authors demonstrated that the disability access on the sites was not correctly handled; they showed that the problems are due to the fact that some critical points of Web and information design affect considerably the issues of accessibility and accountability.

Another research addressed the disability-accessibility of 11 Websites in UK higher education sector [8]. The authors discussed some drawbacks of the most popular method in assessing the accessibility of the Website which involves the checking of resources against accessibility guidelines depending only on automatic validation tools. The most common accessibility barriers addressed was the failure to provide equivalent alternative to graphical information, in addition to the fact that most targeted Websites do not incorporate consistent and efficient navigational system.

METHODOLOGY:

Figure 1 demonstrates the overall methodology used in order to evaluate the accessibility of e-government Websites by people with disabilities.

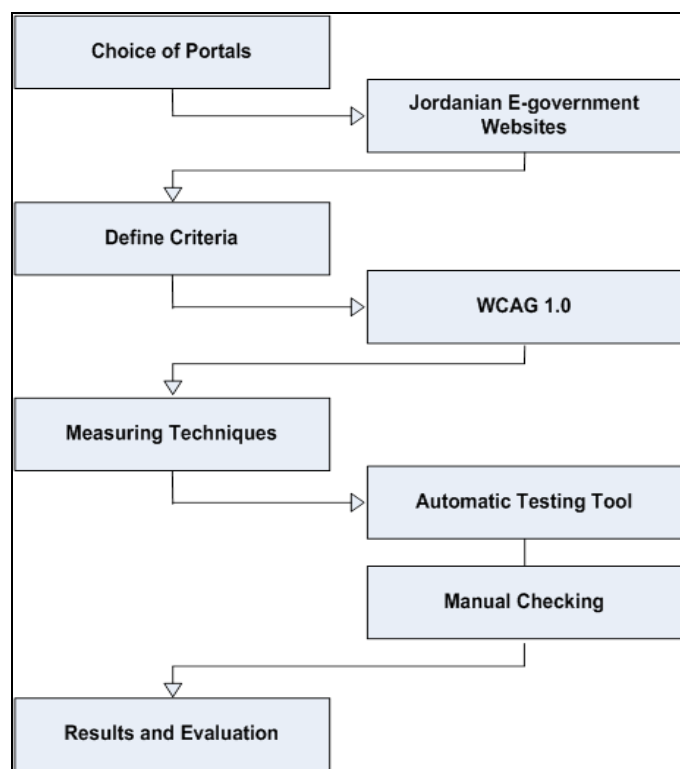





Figure 1. Methodology for Accessibility Evaluation

The first step in the methodology is choosing the portals to be tested for accessibility for people with disabilities. Twenty five governmental Websites were chosen to undergo the test for accessibility. Tests are based on the WCAG 1.0 accessibility criteria; which are described in table 1. Most research papers use the homepage for their assessments. This is because the homepage is the main page of any Website and which serves as an index or table of contents to the documents stored at the Website. Therefore, this research examines only homepages of Jordanian e-government Websites to check if they conform and pass all the WCAG Priority 1, Priority 2 and Priority 3 accessibility checkpoints.

TABLE1. WCAG ACCESSIBILITY CRITERIA DESCRIPTIONS

Priority	Description	Symbols
Priority 1	A Web content developer must satisfy this checkpoint. Satisfying this checkpoint is a basic requirement for some groups to be able to use Web documents.	
Priority 2	A Web content developer should satisfy this checkpoint. Satisfying this checkpoint will remove significant barriers to accessing Web documents.	

Priority 3	A Web content developer may address this checkpoint. Satisfying this checkpoint will improve access to Web documents	
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For automatic testing; TAW, a tool for accessibility analysis of Websites based on WCAG 1.0, is used. Manual checking involves turning off all images using more than 30 browsers and answer the following question; is the same information available through the text browser as it is available through the GUI browser?. Finally, results collected and an overall evaluation of e-government Websites is conducted.

RESULTS AND EVALUATION:

After selecting the portals and specifying guidelines to be followed, TAW is applied to examine whether Websites do have Accessibility errors or not. The results obtained are summarized in figure 2.

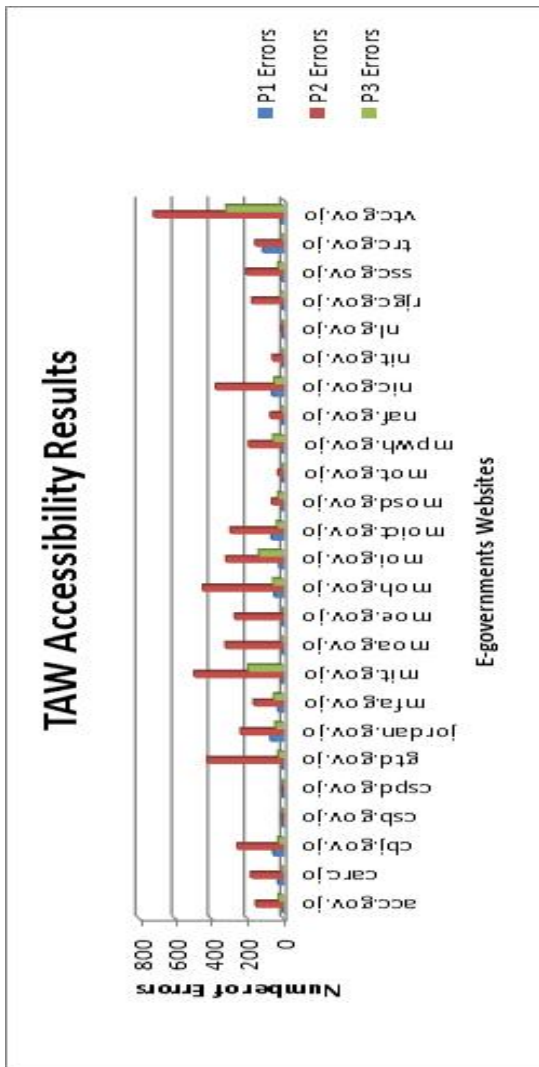


Figure 2. Accessibility Results Obtained Using TAW

Figure 2 shows that none of the 25 Jordanian e-government Websites passed all the W3C Priority 1, 2 and 3 accessibility checks, which means that someone will find it difficult to

access information on these Websites. Out of the 25 Websites, three of them failed because of just less than 20 violations in total of W3C Priority 1, 2 and 3; furthermore, 88% of the sites that failed the accessibility test due to more than 20 violations in total. In addition, above 96% of the main homepages had accessibility errors.

Figure 3 shows that 96% of the targeted Websites had at least one Priority 1 error on their main pages, while almost all the main pages had Priority 2 and 3 errors.

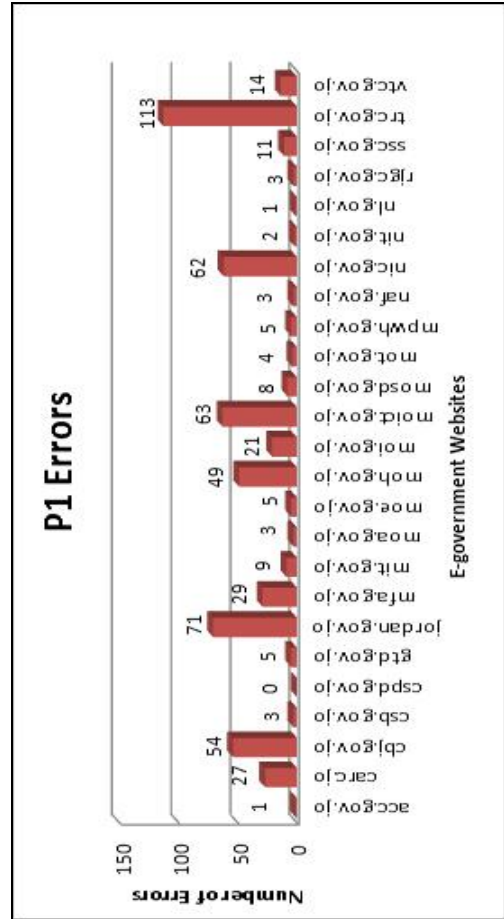


Figure 3. Priority 1 Errors.

The results of checking Priority 2 errors are shown in figure 4. It is clear that all the targeted Websites had at least four errors on their main page. On the other hand figure 5 shows that 92% of the targeted Websites had at least one Priority 3 error of all the viewed pages. In conclusion, there is no Website that is clear of disability accessibility errors.

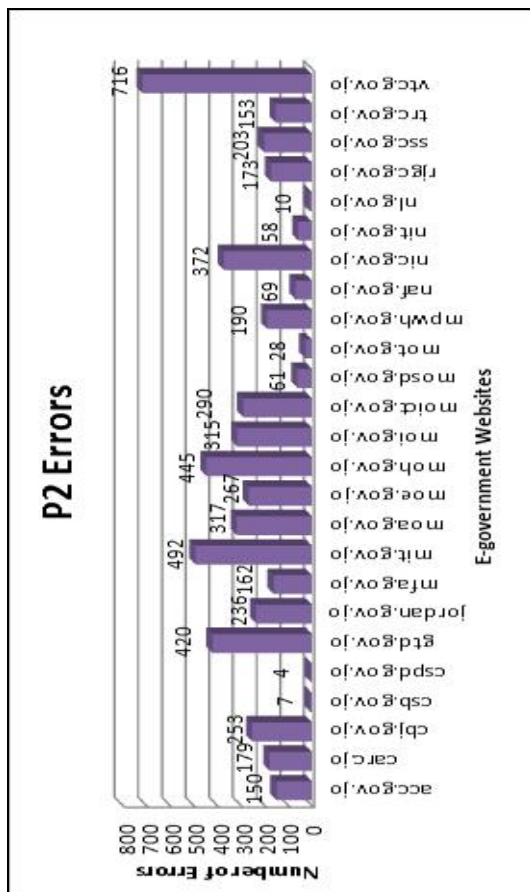


Figure 4. Priority 2 Errors.

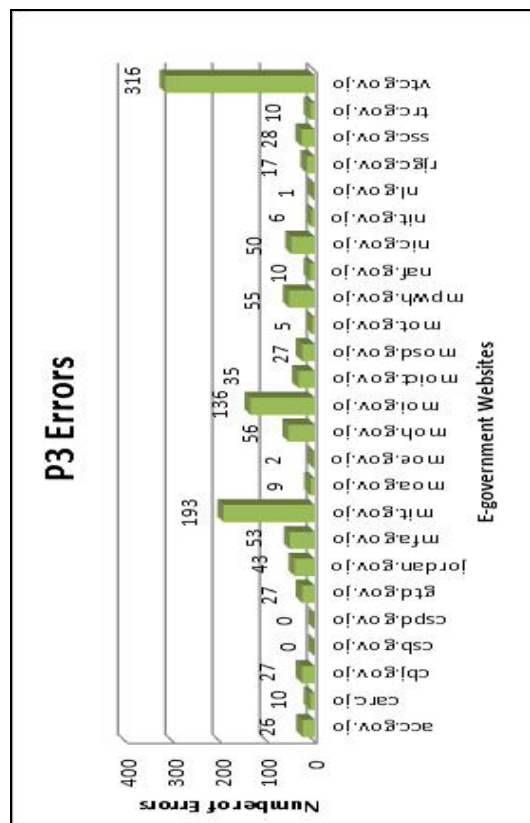


Figure 5. Priority 3 Errors.

From the previous results we can reveal that all the tested Websites have some kind of disability accessibility error in its home page. But, analyzing the numbers presented in the previous three figures we can conclude that the site with the highest level of accessibility was the department of civil Status and passport (www.cspd.gov.jo) which have the minimum number of violations in total of W3C Priority 1, 2 and 3 which is four Priority 2 accessibility problems. On the other hand, the site with the lowest level of accessibility was vocational Training Corporation (www.vtc.gov.jo) which has the maximum number of violations with respect to W3C Priority 1, 2 and 3 with 1046 errors. Table (2) shows the best and worst 5 Websites by total error instances.

TABLE 2. BEST AND WORST 5 WEBSITES

Best and Worst 5 Websites			
Best		Worst	
URL	No. of error instances	URL	No. of error instances
cspd.gov.jo	4	moi.gov.jo	472
csb.gov.jo	10	nic.gov.jo	484
nl.gov.jo	12	moh.gov.jo	550
mot.gov.jo	37	mit.gov.jo	694
nit.gov.jo	66	vtc.gov.jo	1,046

All the targeted Websites have an average of 65.33 errors. This means that these Websites will not be interpreted properly by different Web browsers, like Internet Explorer (IE), FireFox ...etc. Almost all the targeted Web pages indicated that their Websites are best browsed and viewed by a resolution of 1024 x 867, and recommended using IE5.0 at least. Setting a certain resolution or asking for a specific version of browser limits Web accessibility. So, there is a need for manual checking to assess accessibility.

Since automatic accessibility testing is not enough, we carried out a manual check for Websites accessibility. So, we viewed the same Websites on more than thirty browsers using Browsershots which makes screenshots of your Web design in different browsers. Using Browsershots, we noted that almost all of the screenshots were not appearing in correct form; because of this, we reveal that almost all of the targeted Websites are designed only for specific browsers and ignored others. The manual checking results verifies the results obtained from the W3C Validator, which says that the entire targeted Websites were not written in a valid HTML. In addition, a text based browser was used through turning off images and examining the Websites by answering the question about whether the same information are available through the text browser as it is available through the GUI browser? Tests showed that all of the targeted websites failed. This means that

there was no equivalent information available through the text browser to the one available through the GUI browser.

CONCLUSION:

IN THIS PAPER WE ADDRESSED JORDANIAN E-GOVERNMENT WEBSITES ACCESSIBILITY FOR PEOPLE WITH DISABILITIES. 25 WEBSITES WERE TESTED USING TWO METHODS, AUTOMATIC TOOL AND MANUAL CHECKING OF WEBSITES. RESULTS FROM THE TWO METHODS SHOWED THAT ALL JORDANIAN E-GOVERNMENT WEBSITES DO NOT ADDRESS THE ISSUE OF DISABILITY-ACCESSIBILITY, AND ALMOST ALL OF THEM HAVE SIGNIFICANT WEB ACCESSIBILITY PROBLEMS. AS A RECOMMENDATION, WEBSITES DESIGNERS ARE ENCOURAGED TO CONSIDER THE W3C GUIDELINES BECAUSE OF THE INCREASING NUMBER OF PEOPLE WITH DISABILITIES AND IN ORDER TO GIVE THEM THEIR RIGHT IN ACCESSING WEBSITES INFORMATION EQUALLY WITH OTHER. AS A FUTURE WORK, DIFFERENT TOOLS MIGHT BE USED TO CHECK GOVERNMENTAL WEBSITES TO SEE WHETHER ANY DIFFERENCES IN THE ACCESSIBILITY DEGREE WILL BE CAPTURED.

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