

Website Accessibility Performance Evaluation in Malaysia

Handaru Jati
CIS Department
Universiti Teknologi PETRONAS
Email : handaruj@yahoo.com

Dhanapal Durai Dominic
CIS Department
Universiti Teknologi PETRONAS
Email : dhanapal_d@petronas.com.my

Abstract

Website accessibility is one of the most important issues in improving internet usage. Website accessibility is defined as the ability of the website to serve user with disabilities, especially blind people in accessing the internet. Nowadays, a variety of websites accessibility test tools are provided on-line.

This research aims to evaluate the websites accessibility in Malaysia using Tawdish, an on-line accessibility test tool which provides relatively complete analysis of website accessibility. The totals of 90 websites are studied in this research which includes education, government, and business websites, with the assumption that those websites should have good accessibility.

The results of this study show that majority of Malaysian websites did not meet Web Content Accessibility Guidelines (WCAG) criteria.

1. Introduction

Internet provides information, entertainment, news and can be used as communication channel. Only by using a mouse, all of the information from all around the world will be available in the short time. Unfortunately, people with disabilities especially blind people have limitation in accessing information through the internet as many of the websites are not user friendly according to their need. Even, in 2004, Stuggorn found that more than half of the websites run by disability organisations can not meet the level of criteria set up by Web Content Accessibility Guidelines (WCAG) [1]. Loiacono *et al* also found that less than 20% of Fortune 100 websites meet the accessibility criteria according to the need of people with disabilities [2]. This situation creates problem for people with disability as their need on internet

access is not less than people without disabilities. In term of purpose, 75% of them use internet for searching products, while 50% of the users access the internet for online transaction [2].

Another definition of the website accessibility is the ability of the website to be accessed by user using all of the existing browser technology. The website accessibility also refers to the capability of user to understand all of the information contained in the website and the ability of user to interact with the website if it is needed [3]. In relation with this, the World Wide Web Consortium (W3C) developed specification, rules, procedure, software, and mechanism to increase the websites accessibility. Web Accessibility Initiative (WAI), which is part of the W3C, implement 14 rules in the Web Content Accessibility Guidelines (WCAG) that should be followed by website developer. The W3C rules are divided into three priority levels which will influence the level of website accessibility. First Level (priority 1) is a requirement which has to be meet by the website to make the websites can be accessed by blind people [4]. Second Level (priority 2) includes the some items that should be provided in the web page for user with disability to be able to access more information in the web. Third Level (priority 3) requires more items than in the level priority 2 for the user with disabilities to be able to access more complete information in the web. On the other word if the website cannot fulfill the first priority, then user with disability will not have an opportunity to access information in the web. If a website can not satisfy second priority then users will have some problems to access the web, while if the website already satisfied the third criteria then user will have a little difficulties to access the web [2].

Accessibility Assessment

Accessibility assessment consists many items that should be tested in every web page [5]. Those items are the following:

- **Validation of HTML code in every web page.** The validator will assess whether every HTML code used in web page HTML is a standard HTML code for the web.
- **Validation toward accessibility.** The software for testing accessibility will determine whether there is any other factor related with accessibility beside HTML code validation. Software tester will not have any capabilities for testing all of the item listed and need more than one software or equipment for testing the web site.
- **Validation of the navigation in the web page using tab key in the keyboard.** User with disability should be able to access all link in the web and fulfill the entire form provided using tab key.
- **Reading web page using screen reader.** This tool should be able to read all the web page, including picture, visual aids, and form label.
- **Matching of web page with WCAG rules.** Every page should be in line with priority 1 and priority 2 rules, and try to fulfill priority 3. Software tester for accessibility has the capability to give explanation about the item, which is not already fulfilled in a webpage.
- **Validation of web page with the participation of disability people.** This is conducted in order to get the responds and feedbacks about the drawbacks of the tested webpage.

Several web accessibility software available online includes Accessibility Valet Demonstrator (WebThing), AccMonitor Online (HiSoftware), Bobby Online Service (Watchfire), Cynthia Says (HiSoftware), Torquemada (WebxTutti), Wave 3.5 (WebAIM), and WebXact (Watchfire), and Tawdis [2]. This study will use Tawdis which is considered as the web accessibility test tool which able to provide relatively complete analysis of website accessibility.

2. Method

2.1 Design

This research will be conducted using Tawdis software for testing whether the web page meet the criteria in order to be accessed by people with disabilities. This software has an ability to conduct an online test for webpage which is referring to the criteria setup by W3C-WCAG. Tawdis software can

be downloaded from www.tawdis.net. Testing using Tawdis consist of test for HTML code for knowing whether the webpage can be read by screen reader, and testing for knowing whether there are any alternative text for every single picture, animation, video, and audio in the webpage. Tawdis software tester can cover almost 90% of the items demanded by WCAG (watchfire). In every test, Tawdis will give an assessment report of the website accessibility. Among of the information are the number of items which does not meet the requirement, the number of mistakes in every item and the number of line error of the HTML code. This report will assist software developer to improve their website to meet the requirement set by WCAG.

2.2 Material

The material for this research consists of:

- The randomly collected websites from Malaysian government, university (education) and e-business websites.
- Online Tawdis software.

2.3 Procedure

In order to meet the W3C-WCAG criteria and able to pass the Tawdis examination, every website should:

- Provide a text which is equivalent for every picture and multimedia (animation, audio, and video).
- Guaranty that every information in the picture can be understood.
- Identify header section for data in the table format and have the ability to read in every row data inside the table.
- Give a summary for every picture and diagram.
- Provide an explanation about language used in the website.
- Arrange contain of the web clearly, include headings, element, link, and navigation bar.
- Provide the alternative execution for applets, plug in.

Tawdis divides the errors of the accessibility into 3 categories:

- Error Priority 1 which is an error that has a big impact for the user who is having disabilities related with the requirement from WCAG. This error causes the user unable to read the website. Tawdis software will give an approval if the website does not have any priority 1 error. This

improvement is equivalent with Conformance Level A for WCAG.

- Error Priority 2 which is an error that has small impact to the accessibility. If some of the items required by WCAG are present and the website also pass the verification from the user then the website will receive the Conformance Level AA from WCAG.
- Error Priority 3 which is an third-tier error. If all of the required items are present and the website pass the verification from the user then the website will receive the Conformance Level AAA from WCAG.

3. Data Obtained

The results of the websites accessibility test based on the error priority 1, 2, 3 are showed in table 1. The data in table 1 shows that most of the websites in Malaysia can not meet the requirement of WCAG. The table 1 showed that 28, 26 and 26 out of 30 education, government and business websites contained error priority 1, while all of the websites contained error priority 2 and 3.

Table 1. Testing Result for Websites Accessibility Based on Error Priority (EP) 1,2,3 (n=90 Websites)

Website Category	N	Σ of websites contain EP 1 (%)	Σ of websites contain EP 2 (%)	Σ of websites contain EP 3 (%)
Education	30	28 (93%)	30 (100%)	30 (100%)
Government	30	26 (87%)	30 (100%)	30 (100%)
E-business	30	26 (87%)	30 (100%)	30 (100%)

Table 2 illustrates the most frequent error item in each error priority. From the table 2 it can be seen that the majority of the error in priority 1 is error item 1.1. According to Web Content Accessibility Guidelines (WCAG), these error occurs when the website does not provide a text equivalent for every non-text element, includes: images, graphical representations of text (including symbols), image map regions, animations (e.g., animated GIFs), applets and programmatic objects, ascii art, frames, scripts, images used as list bullets, spacers, graphical buttons, sounds (played with or without user interaction), stand-alone audio files, audio tracks of video, and video.

Table 2. The Most Frequent Error Item in Each Error Priority (n=90 Websites)

Website Category	N	EP 1 Item (Σ websites/ %)	EP 2 Item (Σ websites/ %)	EP 3 Item (Σ websites/ %)
Education	30	1.1 (23/77%)	3.4 (27/90%)	4.3 (28/93%)
Government	30	1.1 (27/90%)	11.2 30/100%	4.3 & 5.5 (28/93%)
Business	30	1.1 (22/73%)	11.2 (29/97%)	5.5 (27/90%)

Accessibility testing for error priority 2 shows two main error items, which are error item 3.4 and 11.2. These errors exist because website use relative rather than absolute units in markup language attribute values and style sheet property values. Accessibility testing for error priority 3 shows two main error items, which are error item 4.3 and 5.5. Error item 4.3 occurs because the websites do not identify the primary natural language of a document, and error item 5.5 exists because the websites do not provide summaries for tables.

4. Conclusion

The accessibility level of Malaysian websites is very low as 93%, 87% and 87% of education, government and business websites, respectively, contain error priority 1, whilst, all of the websites surveyed in this study contains error priority 2 and 3. This research should be followed by further research using more reliable tool for measuring the compliance and involving user in the accessibility assessment.

5. References

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