Open Source Markup Validation Tools: A Comparative Study

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Abstract-*A website is simply a collection of web pages which includes multimedia content with a common domain name. Websites can be published on at least one web server. A web page is a document or information resource that is suitable for the World Wide Web and can be accessed through a web browser. Validation is an important step towards the quality of a web page. The validation problem in existing web pages has drawn more attention because of the increasing trend of web communication. In the study, ten open source validation tools namely Wave, Atester, AChecker tool, EvalAccess 2.0, HERA, SortSite, W3C Validator, TAW Online, Accessibility Valet and Validator.nu are compared. The tools are compared on the basis of parameters namely are platform, developed by, availability, accessibility, browser support, type of validation, technology supported, cost, GUI, URL address, file upload and HTML source. It can be concluded on the basis of results that AChecker tool is better validation tool among other ten open source markup validation tools.*

Keywords:website, validation of website, validation tools.

I. INTRODUCTION

The most striking technical developments of recent years have been the rapid growth of World Wide Web. Web sites are identified by Uniform Resource Locator (URL) address. The browser access uniform resource locator entered by the user and display the HTML document. Validation is an assessment of an action, decision plan or transaction to establish that it is correct, complete and is ready to be implemented. Validation can act as a debugging tool, as a future-proof quality check, eases maintenance, helps in teaching good practices. . Now-a-days validation is a sign of professionalism [17].While currently web browsers are doing an increasingly good job of parsing even the worst HTML tags, but some errors are not always caught gracefully. Different software on different platforms are not handling errors in a similar fashion, making it extremely difficult to apply style or layout consistently. So, validation is necessary. Validating a site is the way toward guaranteeing that the pages on the site comply with the standards or principles characterized by W3C. It will guarantee that website pages are translated by different machines in a similar way [18]. It is not necessary that all validating tools should check for the same errors. Some only check CSS, others XHTML, and others for accessibility. This study presents the comparison of markup validation tools namely Wave, Atester, AChecker tool, EvalAccess 2.0, HERA, SortSite, W3C Validator, TAW Online, Accessibility Valvet and Validator.nu[7].

II. LITERATURE REVIEW

Edson Rufino de Souza and Claudia Mont Alvao[1] proposed to evaluate a government website with two semiautomatic accessibility evaluation tools namely Hera and DaSilva. The results have demonstrated that the use of more than one semi-automatic assessment tool can provide enhanced results. They analysed that Hera tool gives global view of results than the DaSilva tool.

Wan Abdul Rahim et al. [2] investigated the accessibility of home stay websites in Malaysia. The evaluation was done from 15th April 2014 to 15th June 2014 by using an automated evaluation tool (AChecker) and Web Content Accessibility Guidelines (WCAG) 2.0.

F. Ricca and P. Tonella [3] analysed tools namely ReWeb and TestWeb to discover many anomalies and failures in Web applications. According to them these tools offer the most advanced features such as reverse engineering of high-level models and structure-based testing.

Melody Y. Ivory and Jenifer Mankoff [4] did a survey of automated tools presented in the context of the user abilities supported by the tools. They also discussed the efficacy of a subset of tools based on empirical study along with the ways to improve existing tools and future research areas.

Majed Alshamari [5] evaluated the accessibility of three popular Arab e-commerce websites using accessibility testing tools namely TAW, EvalAccess, MAUVE and FAE. They had found that most accessibility guidelines are covered by TAW tool. They also found that navigation, readability, input assistance and timing are the common accessibility problems while assessing the websites. They also revealed that

HTML can influence accessibility evaluation as HTML errors are considered as accessibility problems.

III. OVERVIEW OF VALIDATION TOOLS

Validation tools are used to detect errors from various websites. There are various validating tools used for validating the website are Wave tool, Atester, AChecker tool, EvalAccess 2.0, HERA, SortSite, W3C Validator, TAW Online, Accessibility Valvet and Validator.nu [12].

Wave Tool

Wave is very useful validation tool. It is created by WEBAIM. It is also an open-source tool used for validating web-sites. By entering URL on the wave tool original web page can be seen with icons and indicators which reveal the accessibility of the page [10]. Wave tool provides other options to upload by just entering HTML code. Wave is a free web accessibility evaluation tool. It is used to aid humans in the web accessibility evaluation process. Rather than providing a complex technical report, Wave shows the original web page with embedded icons and indicators that reveal the accessibility of that page [7]. Figure1 illustrates the main page of Wave tool.

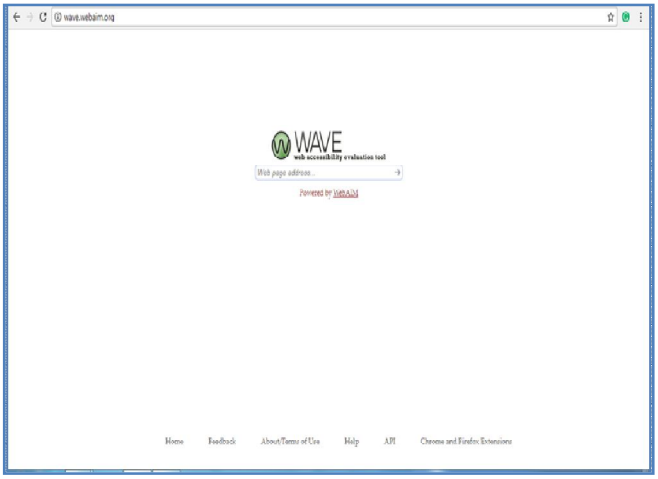

Figure1: Main screen of WAVE Accessibility Tool

Atester

Atester [Beta-version] is an open-source tool to validate a website and also can help to meet WCAG 2.0 for web pages designed with progressive enhancement. Atester is designed to tackle the problems related to the requirements of the website. It is an enhanced version which can find various issues related to a website [13]. Figure 2 illustrates the main screen of ATester tool.

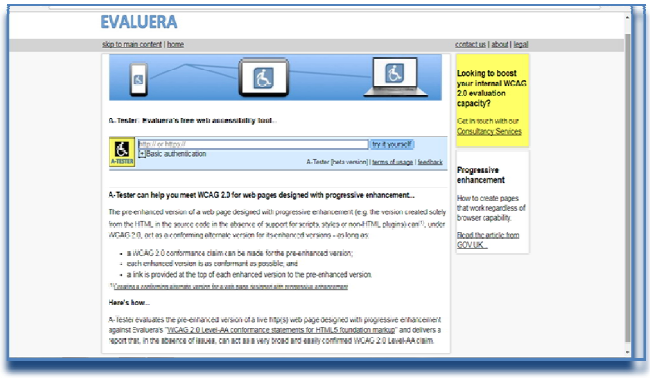

Figure 2: Main page of Atester

AChecker

AChecker is an open source web validation evaluation tool. It can be used to review the accessibility of web pages based on a variety of international accessibility guidelines [14]. It is very useful tool as web accessibility can be examined from AChecker is by entering web page URL or by uploading its HTML file. The characteristics that make this program appealing is that it is interactive, international and customizable, depending on your needs. AChecker provides option to select an international accessibility guideline for accessibility check are Web Common Accessibility Guidelines(WCAG-1.0) (International), WCAG 2.0 (International), BITV 1.0 (Germany), Section 508 (U.S.), Stanca Act (Italy). This tool checks single HTML pages for conformance with accessibility standards to ensure the content can be accessed by everyone [8]. It is an online checker and hosted service that automatically checks single web pages, as well as password protected or restricted pages. Once these are checked, reports are generated with the evaluation results in HTML, PDF, XML and EARL report formats. Figure 3 illustrates the main screen of AChecker.

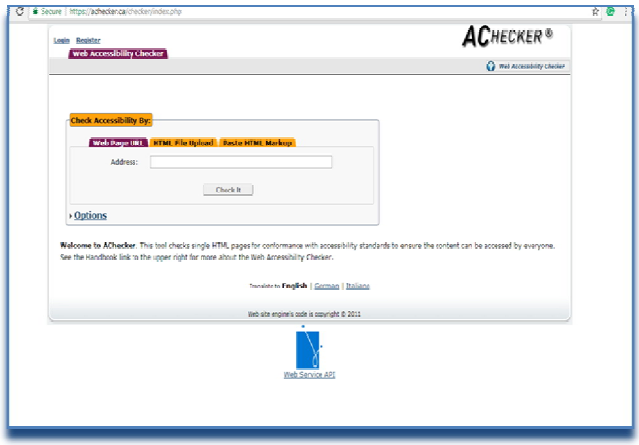

Figure 3: AChecker Web Accessibility Tool

EvalAccess 2.0

EvalAccess2.0 is developed by the University of the Basque Country in Spain. This tool can evaluate a single web page as well as an entire website for WCAG 1.0 and Section508 compliance [11]. Figure 4 illustrates the main page of EvalAccess.

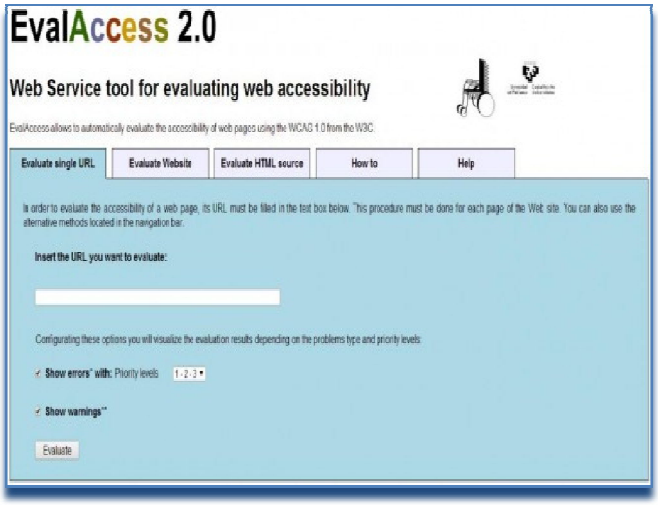

Figure 4: Main screen of EvalAccess 2.0

HERA

HERA is a tool to check the accessibility of web pages according to the specification web content accessibility guidelines [7]. HERA performs a preliminary set of tests on the page and identifies any automatically detectable errors or checkpoints met, and which checkpoints need further manual verification. Figure 5 illustrates the main page of the HERA tool.

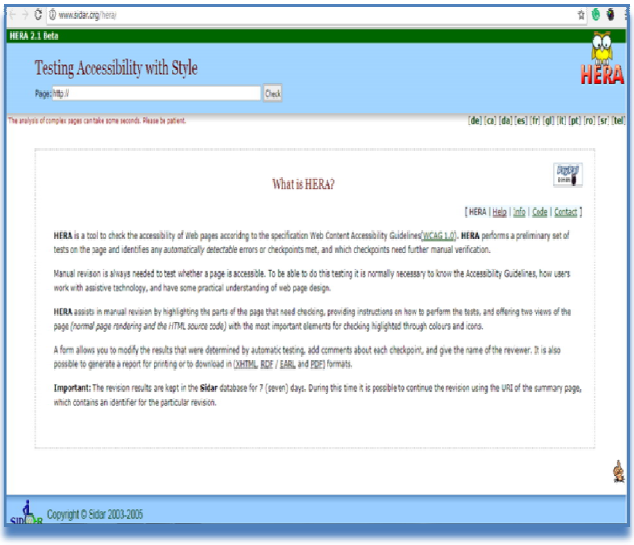

Figure 5: Main screen of HERA Tool

SortSite

It is an accessibility checker and also acts as a validator to validate sites. It is a product of PowerMapper. SortSite is a very good testing tool. It tests all pages it on the site. SortSite checks sites against W3 WCAG accessibility standards, and compliance with Section 508 of the Rehabilitation Act. These checks help to find problems stopping disabled users from using a web site [12]. File formats checked for accessibility include HTML, CSS, JavaScript, PDF, GIF and Flash. In this tool, some accessibility issues require human judgement and cannot be tested automatically. Figure 6 illustrates the main page of SortSite tool.

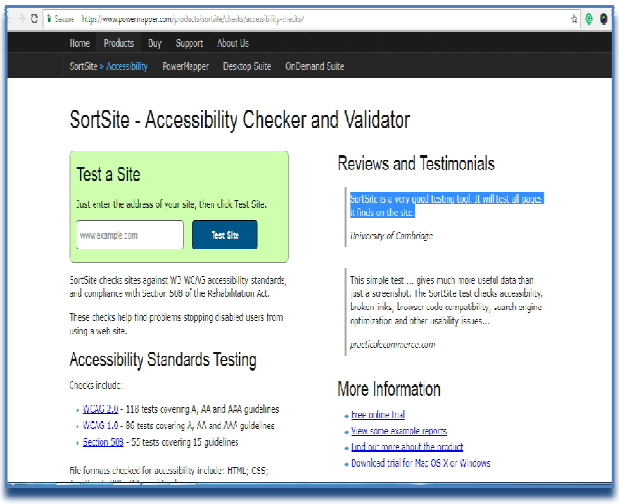

Figure 6: Main screen of SortSite Tool

A. W3C Validator

This validator checks the markup validity of web documents in HTML, XHTML, SMIL, MathML etc [8]. Figure 7 illustratates the main screen of W3C validator.

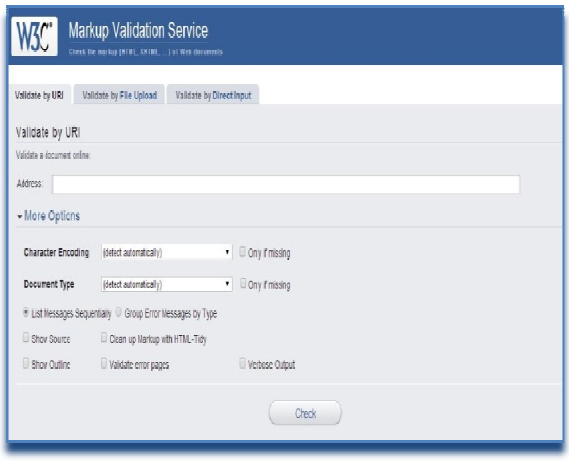

Figure 7: Main screen of W3C Validator

TAW Online

TAW (Web Accessibility Test) is an online tool for the accessibility test of web sites based on the W3C Web Content Accessibility Guidelines. It gives the option to select a guideline WCAG1.0 or WCAG2.0. It also gives the option to select level analysis (Level A, Level AA and Level AA). As per the selected WCAG guideline standard and level, it tests the web site. Figure 8 illustrates the main page of TAW Online tool [15].

Figure 8: Main page of TAW Online Tool

Accessibility Valet

Accessibility Valet is a web accessibility test tool which is designed to confirm accessibility by analyzing markup for W3C Web Content Accessibility Guidelines (WCAG) or Section 508 accessibility compliance. One URL can be verified at a time [9]. Figure 9 illustrates the main screen of Accessibility Valvet.

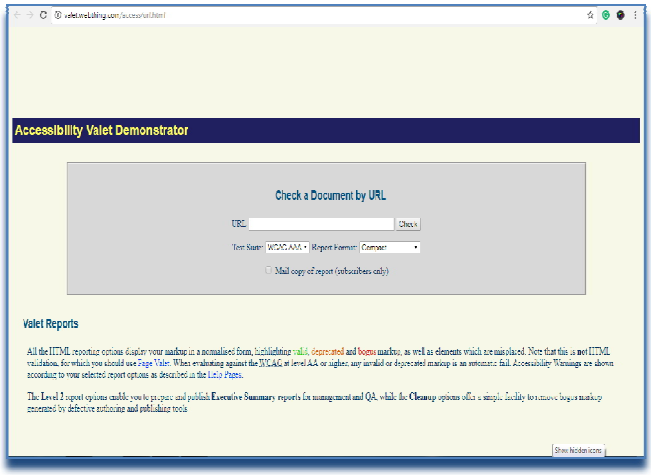

Figure 9 Main screen of Accessibility Valvet

Validator.nu

It is a HTML 5 validator which reports the errors regarding the HTML 5 in a website. It can validate the website using three options namely address, file upload and text field. Through address it simply uses URL address of a website and using file upload option it can simple upload the HTML file and validate it [13]. Figure 10 illustrates the main page of Validator.nu.

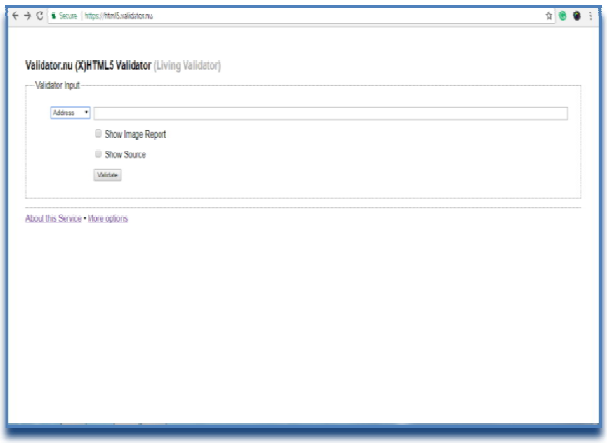

Figure 10: Main page of Validator.nu

IV. OBJECTIVES OF THE STUDY

The objectives of the study is to compare different open-source validation tools used to validate websites. However, the specific objectives are:

- To have an understanding of validation tools on the basis of some parameters.
- To perform a comparison of open-source validation tools namely Wave tool, ATester, AChecker tool, EvalAccess 2.0, HERA, SortSite, W3C Validator, TAW Online, Accessibility Valet and Validator.nu and analyze their performance on the basis of parameters like availability, technology support and browser support etc.

V. RESULTS

There are number of mark up validation tools available in the software market. Although the core functions of these tools are similar, they differ in functionality, features and usability

Parameters for comparison

There are various parameters depends upon which comparison of validation tools will be done. Various parameters are platform, developed by, availability, accessibility, browser support, type of validation, technology supported, cost, GUI, URL address, file upload and HTML source.Table 1 illustrates the comparison of validation tools on the basis of some parameters.

Table 1: Parameters considered for comparison of tools

Sr. No.	Parameters	Wave	ATester	AChecker	EvalAccess2.0	HERA	SortSite	W3C Validator	TAW Online	Accessibility Valet	Validator.nu
1	**Platform**	Windows	Windows	Windows	Windows	Windows	Windows ,MAC	Windows	Windows	Windows	Windows
2	**Developed by**	WebAIM	Evaluera	Web Service API	SIPT07	Sidar.org	PowerMapper	W3C	TAW Foundation	Web thing	Validator.nu
3	**Availability**	Open-source	Open-source	Open-source	Open-source	Open-source	Open-source	Open-source	Open-source	Open-source	Open-source
4	**Accessibility**	Online	Online	Online	Online	Online	Online	Online	Online	Online	Online
5	**Browser Support**	Multi-Browser	Multi-Browser	Multi-Browser	Multi-Browser	Multi-Browser	Multi-Browser	Multi-Browser	Multi-Browser	Multi-Browser	Multi-Browser
6	**Type of validation**	Semi-automatic	Semi-automatic	Semi-automatic	Manual	Semi-automatic	Manual	Manual	Semi-automatic	Semi-automatic	Manual
7	**Technology Supported**	HTML,CSS,XHTML	HTML	HTML,CSS	HTML,XHTML, CSS	HTML,XHTML	HTML	HTML, CSS,XHTML	HTML,CSS,Javascript	HTML	HTML
8	**Cost**	Free	Free	Free	Free	Free	Free	Free	Free	Free	Free
9	**GUI**	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
10	**URL Address**	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
11	**File Upload**	No	No	Yes	No	No	No	Yes	No	No	Yes
12	**HTML Source**	No	No	Yes	Yes	No	No	Yes	No	No	Yes

It is clear from Table 1 that AChecker, W3C alidator and Validator.nu does the validation of a website by entering the URL address or by uploading the HTML file or by just pasting the HTML source code.

VI. CONCLUSION

Validation of a website is important in terms of deciding quality of a web page. There are various open source website validation tools which can be used to decide the quality of a web page. In this study, ten open-source validation tools are compared on the basis of parameters namely platform, developed by, availability, accessibility, browser support, type of validation, technology supported, cost, GUI, URL address, file upload and HTML source. The tools which are considered for the study are Wave, Atester, AChecker, EvalAccess 2.0, HERA, SortSite, W3C Validator, TAW Online, Accessibility Valvet and Validator.nu. It is clear that all the tools taken are open source tool and are free. It is analyzed that AChecker, W3C Validator and Validator.nu does the validation of a website by entering the URL address or by uploading the HTML file or by just pasting the HTML source code. The only feature that makes the AChecker better is that it does the validation semi-automatically and others require manual validation. So, it is concluded that AChecker is a better validation tool for validating websites.

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