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EVALUATION OF WEB ACCESSIBILITY FOR LEARNING AND DEVELOPMENT COMPANY WEBSITES

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ABSTRACT

Present, website shows a dynamic role in all day's life time for communication, finding data, etc. Web accessibility provides a method to access web assets for dissimilar persons with no need on age, linguistic, practice, physical condition and so on. Universal ease of access of websiterests a better-quality test for web designers and investigation persons. Manyeducations have beencompleted to evaluate the web accessibility of various websites. Newly, learning and development company websites increases status since the learning procedure creates with these styles of websites. A small number of of these companies include Harvard business, safety media, degreed, Lynda, etc. Since learning and development company domain is very helpful for scholars across a number of levels, it is needed to access those websites for accessibility. In this study, top 25 learning and development company websites are assessed using two evaluation tools namely TAW, and Hera. The presentation assessment shows that the websites should be improved so that it can be accessible worldwide.

Keywords: *Web accessibility, WCAG 1.0, WCAG 2.0, Hera, TAW.*

I. INTRODUCTION

Currently, the fastimprovement in the part of communication systems offersinternet accessibility to whollysingularpersons. Constructed on a study implemented in intermediate 2017 (MM Group, 2016), nearly 50% of world's persons are loving internet in regular activities. International Telecommunication Unit (ITU) known that about 3200 million persons has used internet in 2017. From 3200 million, more than half of thepersons are from developing countries and 38% of personsbelong to developed countries W3C created a process called Web Accessibility Initiative (WAI), and then it is known as Web Content Accessibility Guidelines (WCAG). All individual website should seethese guidelines to achieve accessibility. These guidelines are represented as de-facto standard to evaluateweb accessibility (Rømen and Svanæs 2012). WCAG 1.0 standard is hosted in the middle of 1990; it provides guidelines to make websites where it will be easy to access by differenttypes of persons. It contains of 14 guidelines, 67 checkpoints with 3 levels of priorities inevery checkpoint. They are working to find the conformity to WCAG 1.0. Thethree level of priorities are Priority 1, Priority 2, and Priority 3.Lately, learning and development company websites improvementsstatussubsequently the educationprocedurecreates with these styles of websites. A small number of these companies contain Harvard business, safety media, degreed, Lynda, etc. Since learning and development companies' area is very helpful for scholars across various levels, it is important to access those websites for accessibility. Theremainder of this paper is arranged as follows. The associated on web accessibility is described in Section2. Research question are given in section3. The evaluation tools are given in Section 4. The web pages are evaluated and the results are examined in Section 5. The highpoints of the education are known and the paper is conclusion in Section 6.

II. RELATED WORK

The educationsexposed that the web accessibility of higher education institutions. (Adepoju and Shehu, 2014) offerssubstantialacquiescent of 36 Nigerian federal university websites on accessibility guidelinesusing HERA and WAVE tools. A test is done on (Li et al. 2016) whichoffer the current condition of32 Chinese public websites and collected different characteristics to develop web accessibility. The study showed that mainstream of the websites needed to improve accessibility. (Hayfa et al. 2016) carried out aneducation to provideendorsements to escape the

problems to access websites. They also pointed out to properly train the website designers to think the problems of accessibility in the method of developing. Jordanian University websites are examined in (Kamal et al. 2016); metrics form differentaccessibilitytechniques are incorporated to conduct this study. Indian universities homepages are evaluated under WCAG guidelines using two traditional evaluationtools (Ismail and Kuppusamy, 2016). Theresult of this study shows the basicguidelines should be followed to improve web accessibility. In (Leporini and Paternò, 2008), the writers selected 15 chosen ways to develop website usability in the quantifiable and qualitative way. It reduces the time to navigate by 37% and it creates websites to access easily by individuals with visual impairment.Many studies keen out that the public are easy to access when compared to private websites (Yu and Parmanto, 2011; Hackett et al. 2004). The writers in (Hanson and Richards, 2013) completed a study in the extended of 14 years from 1999 to 2012, it exposed that the public websites are developed significantly in the current years with smaller number of accessibility violations. (Ismailova, 2017; IsmailovaandKimsanova, 2017)offers the presentcondition of Kyrgyz Republic public websites and collected dissimilarcharacteristics to develop web accessibility. It displayed that main websites reacheslesser usability error rate compared to other websites with lesser security.

III. RESEARCH QUESTION:

In this paper we have tried to test the accessibility of the top learning company websites on differentnations. Our main assistances of this paper are:

- Learning and development companies theexisting situation of web accessibility compliance in the nationscrosswise the world, with special focus on India.
- Examining selected websites of top 25 learning and development company websites in different countries.
- Based on the examination, results have been created to designate to the web accessibility of the websites.
- Proposals to development of the web page design of the learning company websites have been given thereafter.

IV. WEB ACCESSIBILITY TOOLS FOR DATA COLLECTION AND ANALYSIS

The top 25 learning and development company websites are collected from internet in the duration of September to November 2017. The subsetsexamines the accessibility outcomes of the below mentioned25 websites using two popular web accessibility evaluation tools such as TAW, and Hera are examined. The website URLs are examined by twoevaluation tools to find out the problems and make a report under WCAG 1.0, WCAG 2.0 and Section 508 guidelines. The websites are evaluated by these tools by easily providingURL of the website to the home page of the evaluation tools.

Table 1. List of Top 25 Learning Company Websites with URLs and Name

Urls	**Learning company Website Name**
https://elearning.adobe.com/	Adobe eLearning Learning Technologies
http://eu.wiley.com	Wiley Learning Technologies
https://www.cipd.co.uk	CIPD Learning Technologies
http://www.lynda.com	lynda.com Learning Technologies
http://www.mindtools.com	Mind Tools Learning Technologies
http://www.alison.com	Alison Learning Technologies
http://www.onefile.co.uk	Onefile Learning Technologies
http://www.pluralsight.com	Plural sight Learning Technologies
http://www.goanimate.com	Go Animate Learning Technologies
http://www.articulate.com	Articulate Learning Technologies
http://www.bcs.org/	BCS The Chartered Institute for IT Learning Technologies
http://www.ilxgroup.com	ILX Group Learning Technologies

http://www.webanywhere.co.uk	Web anywhere Learning Technologies
http://www.infor.com	Infor Learning Technologies
http://www.pebblepad.co.uk	Pebble Pad Learning Technologies
http://www.virtual-college.co.uk	Virtual College Learning Technologies
http://www.ispringsolutions.com	iSpring Solutions Learning Technologies
http://www.successfactors.com	SAP SuccessfactorsLearning Technologies
http://www.learningpool.com	Learning Pool Learning Technologies
http://www.skillsforhealth.org.uk	Skills for Health Learning Technologies
https://www.findcourses.co.uk/	Findcourses.co.uk Learning Technologies
http://www.lumesse.com	Lumesse Learning Technologies
http://www.saba.com	Saba Learning Technologies
http://www.desire2learn.com	Desire2Learn Learning Technologies
http://www.tribalgroup.com	Tribal Group Learning Technologies

a. TAW

It is developed by CTIC Centro Tecnólogico using foraccessibility testing toolthat evaluates accessibility of website under WCAG 1.0 and 2.0.guidelines. It proposals TAW3. Analysis Engine many tools with dissimilar uses such as TAW3 Standalone for Desktop, TAW3 Web Start for Java-based software and TAW3.The websites homepageshas to be tested by using this tool. By pressing the button of the form, an analyzing the result and also the report will be generated with the number of problems, warnings and not reviewed in terms of perceivable, Operable, Understandable and Robust. The snapshot of the TAW tool webpage is shown in Fig. 1.

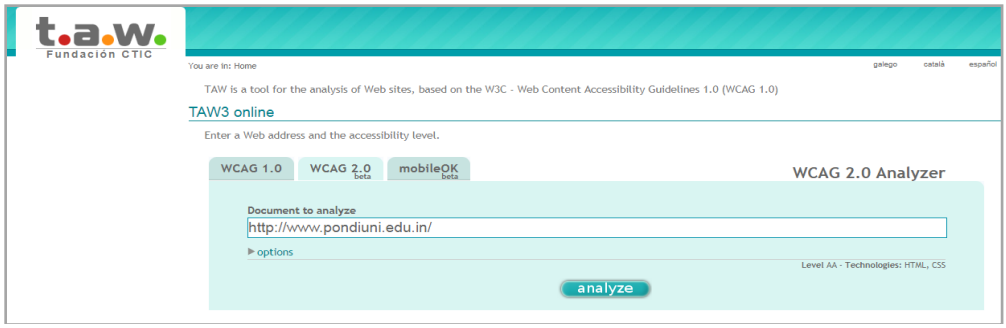

Fig. 1. Home page of TAW tool

b. Hera

It is used to assessment the accessibility of Web pages following WCAG1.0guidelines. Some testsare implements on the webpage and discoveriesmistakes or barriers, and checkpoints needextra human valuation. Human interference is needed to check whether a page is accessible. It assistances in manual review by specifying the chunks of the page that need testing, providing instructions to do the proof and provide two outlooks of the piece of paper with the mainfundamentals for checking highlighted through colors and icons. It is also accessible to generate the report to print or save in (XHTML, RDF / EARL and PDF) formats. The screenshot of the Hera tool webpage is shown in Fig. 2.This tool can be used by providing the website's URL has to be tested. By pressing the click button of the form, the report will be generated with the number of pass, fail and not available items in terms of three priorities P1, P2 and P3

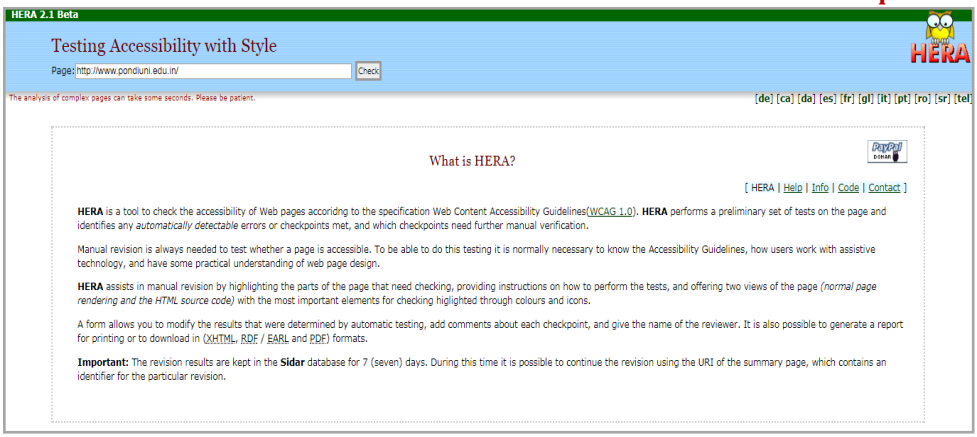

Fig. 2. Home page of Hera tool

V. RESULTS AND ANALYSIS

This section analyses the accessibility results of the above mentioned 25 websites using twostandard web accessibility evaluation tools namely TAW, and Hera are analyzed. The website homepages are examined by twoevaluation tools to discovery theproblems and produce a report under WCAG 1.0, WCAG 2.0 and Section 508 guidelines. The obtained outcomes of 25 websites are described in the subsequent sections. The statistical results of these tools are tabulated in Table 2-3.Comparative analysis on errors under different priorities for 25 websites are shown in Fig 3-4.

a. Performance analysis using TAW

This sectiondescribes the accessibility results of 25 websites by using TAW tool. The websites are validated for errors, warnings and not reviewed for three levels of priorities. The comparison of problem, warning and not reviewed items under AAA conformance level for websites as shown in Figs. 3.The statistical results of TAW tool for AAA is tabulated in Table 2 with the total number of problems, warnings and not reviewed pages. The outcomes are given on the beginning of P, O, U,R and S.The table shows that the maximum number of problems appeared is 1995 with the average value of 21.22 and DS of 21.01. Similarly, the total number of warnings occurred are 74728 with the average and SD of 794.97 and 844.32 respectively. The maximum number of not reviewed items found is 1000 with the average and SD of 10.63 and 1.54 respectively.

b. Performance analysis using Hera

This sectiondescribes the accessibility results of 25 websites which are confirmed by Heratool is given. The comparison of achieved results in terms of needs checking, pass and fail for websites areshown in Figs. 4. The statistical results of Hera tool is given in Table 3 which provides the total number of pages needs checking, pass, fail and not available under three priorities (P1, P2 and P3). The highest value of pages needs checking appears at P2 with the value of 1468, mean 16.87 and SD of 2.48. The highest pass value occurred at P2 with the value of 225, mean 2.58 and SD of 1.176. Similarly, the maximum fail value occurred at P2 with the value of 283, mean 4.453 and SD of 1.642 respectively.

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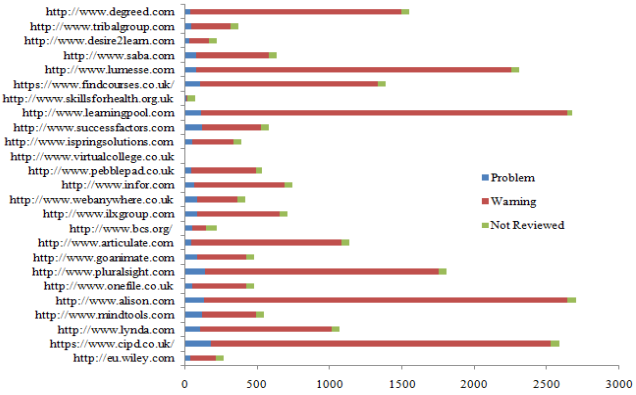

Fig. 3. Comparative analysis on errors under three priorities for 25 websites

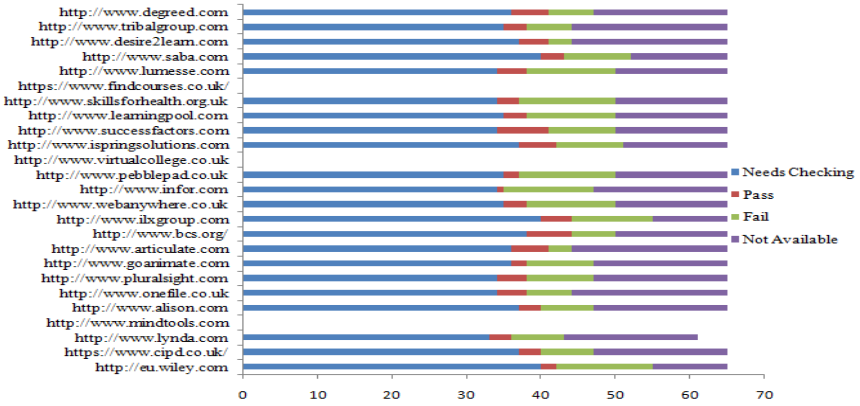

Fig. 4. Comparative analysis on errors under four priorities for 25 websites

Table 2 Statistical results of TAW tool for A

	PROBLEMS P, O, U, R, S					WARNINGS P, O, U, R, S					NOT REVIEWED P, O, U, R, S				
TOTAL	1995	858	195	1405	529	2760	1698	257	74728	635	284	540	172	41	1000
AVG	21.22	9.12	2.07	14.94	5.62	29.36	18.06	2.73	794.97	6.75	3.02	5.74	1.82	0.43	10.63
STDEV	21.01	15.17	2.12	13.64	1.50	59.97	20.12	2.49	844.32	1.82	0.14	0.76	0.63	1.60	1.54

Table 3 Statistical results of HERA tool

	Needs checking			Pass			Fail			Not available		
	P1	**P2**	**P3**	**P1**	**P2**	**P3**	**P1**	**P2**	**P3**	**P1**	**P2**	**P3**
TOTAL	632	1468	936	9	225	93	101	383	214	720	408	366
AVG	7.268	16.87	10.883	1	2.58	1.309	1.530	4.453	2.45	8.372093	4.744186	4.255814
STDEV	1.145	2.48	1.384	0	1.176	0.523	0.684	1.642	0.93	0.895039	1.617449	0.856615

VI. CONCLUSION

More than a few studies have been done to evaluate the web accessibility of different websites. Newly, learning and development company websites achievements popularity since the learning process creates with these styles of websites. A small number of these companies include Harvard business, safety media, degreed, Lynda, etc. Since e-learning domain is very helpful for students across different levels, it is important to access those websites for accessibility. In this study, 25 learning and development company websites are assessed using two evaluation tools namely TAW and Hera. Comparative analysis on errors under different priorities for 25 websitesand the result indicates that the websites should be improved so that it can be accessible worldwide.

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