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Accessibility of Indian universities' homepages: An exploratory study

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Abstract Websites have evolved into an excellent medium of information dissemination and visibility. Hence governments and organizations around the world have websites as primary medium for information communication. The universal accessibility of this web medium remains a major challenge for both web developers and accessibility researchers. Conformance of WCAG 2.0 guidelines by web pages is a significant factor in measuring universal accessibility. This paper presents an exploratory study about the accessibility of Indian university website homepages. We have analyzed the homepages of 302 Indian universities under different conformance levels of WCAG 2.0 recommendation using automatic accessibility evaluation tools to find accessibility report of websites and then classified them comparatively into three groups namely low accessible websites called Tier-III, medium accessible websites called Tier-II and high accessible websites called Tier-I. Statistical classification and accessibility report of websites shows that an array of further improvements have to be made in order to make them more accessible and usable in terms of WCAG 2.0. Based on the results of the analysis, this paper proposes the necessary steps which shall be taken to further enhance the accessibility of the websites.

1. Introduction

In the last 15 years (2000–2015), internet user base has undergone a phenomenal increase from 361 million users in the year 2000 to the present value which is greater than 3270 million.[1] In 2015, Asia's internet users are 47.8% and rest of world is 52.2%. As the web has become the primary information access resource, the web accessibility has evolved into a critical issue in the present scenario. Web accessibility is the measure of ease and comfort with which, a person with disability would be able to access the web resources similar to the manner a typical user would access. In addition to persons with disabilities, the special needs of elderly persons while accessing the information is also under the purview of web accessibility. The accessibility can be measured in three layers according to levels of conformance of *WCAG 2.0 (Web Content Accessibility Guidelines)* as fully accessible, partially accessible, and inaccessible one. When the contents are easily accessible to users regardless of disability then website is said to be accessible.

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[1] Internetworldstats [WWW Document], 2015. URL http://www.internetworldstats.com.

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Access by everyone is an essential aspect and the power of web is in its universality.[2] According to W3C, the designers should take into consideration all different types of disabilities like Visual disabilities, Audio Disabilities, Speech, Cognitive and Learning disabilities, etc. when designing and building websites.[3] Also, according to W3C, *the web is fundamentally designed to work for all people, whatever their hardware, software, language, culture, location or physical or mental ability* and the element which is critical for the World Wide Web is Accessibility.[4]

The main motive of e-Accessibility Toolkit for Policy Makers is to measure the accessibility of product or service which are used by persons with disabilities as effectively as used by persons without those disabilities. People with different disabilities have different needs for accessing a technology so accessibility guidelines or standards have been formulated for different technologies to ensure the product or service is accessible to all persons in one or other.

The WCAG 2.0 standard formulated by the World Wide Web Consortium (W3C) is the universally adopted standard for designing or making websites that are fully accessible (Olalere and Lazar, 2011). Hence Governments (Patr et al., 2014) around the World have formulated their customized accessibility policies on this standard. The fundamental accessibility principles – POUR of WCAG 2.0 are as given below:

- **Principle 1:** All content, including text information, multimedia, video and audio must be presented to users in a way they can perceive easily *(Perceivable)*.
- **Principle 2:** The components of user interface and navigation must be operable *(Operable)*.
- **Principle 3:** User interface information and operation must be understandable *(Understandable)*.
- **Principle 4:** Enable contents which are to be interpreted reliably by a wide variety of user agents including assistive technologies, must be robust*(Robustness)*.

The conformance levels which are used by WAI Guidelines for assigning priority based mechanism for measurement of website are given below:

- **Priority 1:** Conformance to this priority level is described as *A* level conformance. In this priority, the guidelines of WCAG 2.0 must be satisfied by web developers, otherwise it will be impossible for one or more groups to access the web content easily.
- **Priority 2:** Conformance to this priority level is described as *AA* level conformance. In this priority, the guidelines of WCAG 2.0 should be satisfied by web developers, otherwise some groups will find it difficult to access the web content.
- **Priority 3:** Conformance to this priority level is described as *AAA* level conformance. In this priority, the guidelines of WCAG 2.0 may be satisfied by web developers in order to make it easier for specialized groups to access the web content.

The accessibility of web pages is one of the important criteria for disseminating information to a wider group of audience. This paper focuses on measuring the accessibility of *Homepages of Indian Universities*. The university web sites serve as the primary information source for both the aspiring candidates who want to join or the existing students to better harness the resources hosted in the University web page. With the phenomenal increase in adaptability of digital medium for information delivery in countries like India, measuring of accessibility is mandatory, as it provides key insights for improving it further.

Another key aspect of performing the accessibility study is that a number of people who get benefited by such an effort is very significant. According to the United Nations report, there are around 1 Billion persons with disabilities which is 15% of the world population. In order to create an inclusive ambience, the requirements of these persons in accessing information resources on the digital ecosystem needs to be given higher priority. This study is a step towards achieving such a goal.

2. Motivations

The products and environments which are designed for all categories of people should be usable and accessible is the main aim of Universal Design. When we use universal design strategies to web interfaces, most of the persons with disabilities who already use web feel better and easier in accessing the contents of web than before (Laux, 1998). So, for achieving better accessibility of web pages we have to follow universal design standards completely. Web accessibility means that *anyone using any kind of web browsing technology must be able to visit any site and get a full and complete understanding of the information as well as have the full and complete ability to interact with the site if that is necessary* (Chisholm et al., 2001). Keeping track of the accessibility level of pages and the need of accurate methods and tools for measurement of accessibility is the main aim of International accessibility observatories like *European Internet Accessibility Observatory (EIAO)*, *Vamola project in Italy*.

Various studies have been conducted on analyzing specific group of websites across a spectrum. When analyzed, state level websites of Maryland by Lazar et al. (2013), it was found that there was tremendous a need for longitudinal studies of state level website accessibility and then the role of the web page template which was introduced in Maryland state government web pages and the template has been performed background check for accessibility and the result showed an improvement in accessibility and often a tremendous one (Lazar et al., 2013). An exploratory study on accessibility of Chinese local government websites were examined to find how much they are accessible in terms of WCAG 2.0 and it has identified many accessibility issues for persons with disabilities. Recommendations were also provided to improve the accessibility levels (Shi, 2007).

The Spanish University websites were analyzed and evaluated to check the validity of websites in terms of web

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