

Chapter 6

Unified Website Accessibility Assessment Framework

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ABSTRACT

In this chapter, a unified web accessibility assessment (UWAA) framework and its software has been proposed. UWAA framework was developed by considering Web Content Accessibility Guideline 2.0 to evaluate accessibility of web sites by integrating more than one evaluation approach. Achecker tool as an automated evaluation approach and barrier walkthrough (BW) as an expert-based evaluation approach were integrated in the UWAA framework. The framework also provides suggestions to recover from the problems determined to the evaluators. The websites of three universities were evaluated to determine the framework's accuracy and consistency. It was revealed that the results obtained from automated and expert-based evaluation methods were consistent and complementary with each other. Furthermore, it has been demonstrated that problems which cannot be determined by an automated tool but which can be detected by an expert can be identified by BW method.

INTRODUCTION

According to the Global Digital report (2019) published in January 2019, over 7 billion people live worldwide and there are approximately 4.39 billion Internet users. Compared to January 2018 data, it was observed that the number of Internet

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users increased by 366 million (approximately 9%) in a year. Besides, according to Internet live statistics, there are currently more than 1.7 billion websites, and this number is increasing every day (W3C, 2020).

Websites become main mechanism to disseminate information to a variety of audiences for a wide spectrum of organizations from commercial to governmental. Since they operate in all aspects of daily life, people have begun to meet many of their needs by them. Therefore, the importance that organizations place on their websites to sustain their existence is also growing.

Websites are public platforms that are used to present and access to information at the same time. It is used by all user groups, including those with special needs (Shneiderman, 2000). As a result, websites need to be designed to be understandable and accessible to everyone (Henry et al., 2014). At this point, the concept of “universal design” emerges (Zaphiris & Ellis, 2001). Universal design is a very broad concept that includes the concepts of accessibility and usability (Iwarsson & Staahl, 2003; McGuire et al., 2006). It is defined as providing web pages that all people regardless of having any disability or being old can easily access (“KAMIS,” 2019; Laux, 1998).

Although usability and accessibility are the two terms that are closely related, they are not the same. Usability is expressed as the effectiveness, efficiency, and user satisfaction of a product within the context and objectives set by a specific user group (ISO, 2019). Even if usability implies accessibility, it does not correspond exactly to accessibility (W3C_WAI, 2016). On the other hand, Web Accessibility Initiative (WAI) defines accessibility as people with disabilities can perceive, understand, navigate, and interact with the Web and contribute to the Web (W3C_WAI, 2019). Although accessibility primarily focuses on users with disabilities according to this definition, it also aims to be useful for all users. It is sometimes considered as a subset of usability (Henry, 2002; Ma & Zaphiris, 2003). However, to put it together, both are complementary design philosophies and implement methods and techniques of each other (Alexender, 2006).

Web Accessibility Initiative (2019) defines web accessibility as “people can perceive, understand, navigate, and interact with the Web and contribute to the Web”. World Wide Web Consortium (W3C) has developed Web Content Accessibility Guidelines (WCAG) for ensuring web site accessibility. Three versions of these guidelines were developed up until now and these are WCAG 1.0 (W3C, 1999), WCAG 2.0 (W3C, 2008) and WCAG 2.1 (W3C, 2018). Apart from these general guidelines, many countries have made web accessibility mandatory with regulations such as ISO 9241-20 (ISO, 2008) or Section 508 (US Access Board, 2000).

There are several approaches to evaluate the accessibility of websites. These are automated evaluation, expert based / manual evaluation, user tests and some hybrid approaches. Automated evaluation is an evaluation carried out with software tools (W3, 2016) that check websites with respect to accessibility guidelines. Expert

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