Automated Accessibility Evaluation Software for Authenticated Environments
A Heuristic Usability Evaluation

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Abstract. Web accessibility has been the subject of much discussion regarding the need to make Web content accessible to all people, regardless of their abilities or disabilities. While some testing techniques require human intervention, accessibility can also be evaluated by automated tools. Automated evaluation tools are software programs that examine the code of Web pages to determine if they conform to a set of accessibility guidelines that are often based on the Web Content Accessibility Guidelines Version 2.0 (WCAG 2.0), developed by the World Wide Web Consortium (W3C). In this context, the purpose of this study is to analyze an automated software program for evaluating authenticated environments and verify the usability of this tool, since automated systems require precision and reliability in terms of both results and use in any type of environment. With this in mind, this paper aimed at evaluating the ASES software by means of a heuristic evaluation carried out by three experts. The analysis revealed major accessibility problems, as well as improper functioning of available tools and inconsistency of results. Furthermore, ASES was found to have problems of efficiency, interaction, validity, and reliability in the results presented. Considering that this is an open-source accessibility testing tool that can be found on a government web site, the correction or improvement of the system’s deficiencies identified in this study is highly recommended, as there is a lack of software available to evaluate authenticated environments.

Keywords: Automated evaluation tool, heuristic evaluation, usability.

1 Introduction

Web accessibility has been the subject of much discussion regarding the need to make web content accessible to all people, regardless of their abilities or disabilities. According to the W3C [1], web accessibility refers to allowing all people to perceive, understand, navigate, interact with and contribute to the web.
In this context, accessibility evaluation encompasses a range of procedures aimed at detecting known accessibility problems, such as violations of guidelines, system failures, errors, or user performance indicators [2]. Several approaches have been used to assess the accessibility of a site. Automated evaluation tools, for example, are software programs that test virtual environments for accessibility by analyzing their code to determine how well they meet the guidelines established for the inspection.

According to [3], evaluation methods differ in terms of their validity, usefulness, reliability, and efficiency. With these considerations in mind, the purpose of this study was to analyze automated software designed to evaluate authenticated environments in order to verify its usability precision and reliability. The software selected for analysis is referred to as ASES (Site Accessibility Evaluator and Simulator) [4]. The criteria used for tool selection focused on the compliance with the WCAG 2.0, subscription to the open-source philosophy, and validation of an authenticated environment – in this case, Moodle [5]. In an initial survey, seven automated accessibility evaluation tools were identified, but only two were selected: WAVE and ASES.

The objective of the first phase of this study was to evaluate WAVE, and the results are described in [6]. The present paper reports on the second phase, which centered on the examination of the ASES software. The analysis was performed by three experts, as suggested by Nielsen [7], and consisted of conducting a heuristic usability test founded on the ergonomic criteria presented in [8]. Each of the experts analyzed the tool according to criteria based on a severity scale. After the individual evaluations were completed, each evaluator verified the arguments used by their colleagues in order for them to reach a consensus and assign a collective score. In doing so, errors found individually could be assessed and reassessed by all experts.

2 Automated Evaluation Software

Automated evaluation software, also known as validator, evaluator and online validator, scans the code of a web page and checks its content for accessibility. These tools help determine if a given interface was developed according to accessibility standards [9].

Some of the automated accessibility validation software tools available online for free meet the minimum requirement for selection – i.e., compliance with the recommendations of both WCAG 1.0 and WCAG 2.0. The initial plan was to choose from the pool of programs suggested by WAI, but the list was found to be outdated1, as none of the tools singled out adhere to the standards for accessibility set forth in WCAG 2.0. Thus, we used the programs picked out by [10] in addition to other tools identified by the authors of the present work. Table 1 presents the selected tools.

1 http://www.w3.org/WAI/ER/tools/complete