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Toward an integration of Web accessibility into testing processes

Mary-Luz Sánchez-Gordón[a,] * Lourdes Moreno[a]

[a] *Computer science department,Universidad Carlos III de Madrid, Av. Universidad 30, Leganés 28911,Spain*

Abstract

The goal of this paper is to review the literature in order to understand the implications of accessibility testing processes with the objective to detect potential improvements and developments in the field. Thus, a brief review is presented of the fundamental test processes proposed by the International Software Testing Qualification Board (ISTQB) and the currently available literature about testing processes for evaluating the accessibility of web applications. The result of the review reflects an array of proposals to incorporate accessibility requirements and evaluation tools, but they do not describe a comprehensive testing process at each phase of the development lifecycle of accessible web applications.

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Keywords: testing, accessibility, ISTQB, test process, ;

1. Introduction

Whilst accessibility is widely agreed as an essential requirement for promoting universal access of information, many web sites still fail to provide accessible content. Ensuring to conform to accessibility should be a concern at each phase of the development process and consequently it should be integrated as soon as possible in the lifecycle [1]. Nevertheless, the goal of equal accessibility will not be easy to attain [2]. A way to ensure the achievement of objectives in each phase of the development process is to apply a testing process.

* Corresponding author.
E-mail address: mary_sanchezg@hotmail.com

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In fact, testing is an essential activity in software industry because it allows one to control and improve the quality of the software product. Also, a well-qualified staff is necessary to develop tasks in an efficient way [3]. There's no reason to think those same ideas couldn't be employed in creative ways for web applications [4]. The goal of testing Internet-based applications is no different from that of traditional applications. We need to uncover errors in the application before deploying it to the internet. However, compared with traditional software, web applications have many special properties, such as accessibility. Therefore, additional efforts are needed in web testing [5]. The purpose of the present study is to identify if there is a well-defined test process that it ensures the web accessibility development.

This paper is structured as follows: Section 2 gives a brief introduction on web accessibility. Section 3 describes software testing and several software testing certifications. Section 4 presents an overview on ISTQB certification foundation level. In Section 5 we discuss how to integrate accessibility on testing software process, and finally in Section 6, we present the conclusions and future work.

2. Web accessibility

In web environments, the growth in the number and variety of web applications has placed the Web as one of the most important technologies for the development of the so called "Information Society" [6]. Tim Berners Lee, W3C Director and inventor of the World Wide Web, has stated that "*The power of the Web is in its universality. Access by everyone regardless of disability is an essential aspect*".

Web accessibility encompasses all disabilities that affect access to the Web, including visual, auditory, physical, speech, cognitive, and neurological disabilities [7]. While access to people with disabilities is the primary focus of web accessibility, it also benefits people without disabilities. Thus, accessible technology is technology that users can adapt to meet their visual, hearing, dexterity, cognitive, and speech needs and interaction preferences [7], [8].

In order to achieve comprehensive web accessibility, a significant number of initiatives, legislation and standards exist which identify problems and suggest new, accessible designs. Among accessibility standards, the World Wide Web Consortium (W3C) along with the Web Accessibility Initiative (WAI) both deserve special mention [9] . The Web Content Accessibility Guidelines (WCAG) [10] are the most important component of the WAI and for which two versions currently exist, namely, WCAG 1.0 and WCAG 2.0. While the former version is still that named in many legislative and regulatory frameworks, in other contexts it has been supplanted by WCAG 2.0 since as early as its publication date as a W3C Recommendation in December of 2008. In the European Union and following Digital Agenda and the standardization mandate 376 [11], [12], WCAG 2.0 is considered the official standard. WCAG 2.0 is also referenced in the legislation of many other countries. Australia, Canada, Hong Kong, Japan and New Zealand, for example, have already adopted WCAG 2.0. Other important WCAG 2.0-based initiatives include BITV 2 [13] in Germany, RGAA [14] in France, AODA [15] in Ontario, JIS X 8341-3 [16] in Japan, UNE 139803 in Spain [17] and Section 508 (29 U.S. Code § 794d) in the United States [18]. The requirement to fulfill the WCAG 2.0 has been finally resolved with the recent appearance of the ISO / IEC DIS 40500 which includes the same content as WCAG 2.0 [19]. This web standard can be extrapolated to other software standards [20], since many of its requirements apply to user interfaces in interactive systems software. Moreover, there are general software standards such as ISO 9241-171:2008 (Guidance on software accessibility) [21] which provides specifications for the design of accessible software. Likewise, ISO 9241-171:2008 covers issues associated with designing accessible software for people with the widest range of physical, sensory and cognitive abilities, including those who are temporarily disabled, and the elderly. Furthermore the British Standards Institute developed BS 8878: 2010 Web Accessibility Code of Practice [22]. According [23] this document provides: "... a framework that allows definition – and measurement – of the process undertaken by organisations to procure an optimally accessible web site, but is at present a copyrighted work and not freely available. In comparison to a purely technical WCAG conformance report, the nature of the data being gathered for measurement means that inevitably the measurement process is longer; but it also provides a richer set of data giving context – and therefore justification – to current levels of accessibility."

Although there are many techniques for supporting the development of accessible web applications, many developers are not aware of them [24] and many organizations do not properly apply them. web developers mostly