Chapter 16
Evaluation of Web Accessibility:
A Combined Method

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ABSTRACT

The Web is present in all fields of our life, from information and service Web pages to electronic public administration (e-government). Users of the Web are a heterogeneous and multicultural public, with different abilities and disabilities (visual, hearing, cognitive, and motor impairments). Web accessibility is about making websites accessible to all Internet users (both disabled and non-disabled). To assure and certify the fulfillment of Web accessibility guidelines, various accessibility evaluation methods have been proposed, and are classified in two types: qualitative methods (analytical and empirical) and quantitative methods (metric-based methods). As no method by itself is enough to guarantee full accessibility, many studies combine these qualitative and quantitative methods in order to guarantee better results. Some recent studies have presented combined evaluation methods between qualitative methods only, thus leaving behind the great power of metrics that guarantee objective results. In this chapter, a combined accessibility evaluation method based both on qualitative and quantitative evaluation methods is proposed. This proposal presents an evaluation method combining essential analytical evaluation methods and empirical test methods.

INTRODUCTION

Nowadays, the Web is present in all fields of our life, from access to information and service Web pages to electronic public administration (e-government). The social and economic impact of the Internet cannot be denied. Many people cannot imagine their lives without the Internet these days. However, many users of the Web can encounter various problems if websites do not accomplish a minimum level of Web accessibility. Therefore, Web accessibility is becoming increasingly criti-

cal to the Internet experience. Tim Berners-Lee, inventor of the World Wide Web, once noted, "*The power of the Web is in its universality. Access by everyone regardless of disability is an essential aspect*" (W3C, 2011).

Traditionally, accessibility is a term more associated with architectural thought, rather than website development. With websites, the term traditionally refers to the development of websites accessible to all users who may want to access them, independent of the abilities or disabilities of the users. When websites are correctly designed and developed, all users can have equal access to information and functionality. A simple definition of Web accessibility is "*the property of a site to support the same level of effectiveness for people with disabilities as it does for non-disabled people*" (Slatin & Rush, 2003). An alternative definition of accessibility id "making Web content available to all individuals, regardless of any disabilities or environmental constraints they experience" (Mankoff, Fait, & Tran, 2005).

Web accessibility primarily benefits people with disabilities. However, as an accessible website is designed to meet different user needs, preferences, technical knowledge, and situations, this flexibility can also benefit people without disabilities in certain situations, "*such as people using a slow Internet connection, people with temporary disabilities such as a broken arm, and people with changing abilities due to aging*" (W3C, 2011). Moreover, an accessible website can also help people who have limited access to certain technology, such as slow computers or slow Internet connections.

To provide access to all possible users represents a huge challenge. Web accessibility aims to address the needs of heterogeneous users with different impairments, such as visual impairments, mobility impairments, hearing impairments, cognitive impairments, and learning impairments.

In 1999, the Web Accessibility Initiative (WAI), a project by the World Wide Web Consortium (W3C), published the Web Content Accessibility Guidelines (WCAG) version 1.0 (W3C, 1999a). These guidelines have been widely accepted as the definitive guidelines on how to create accessible websites. On 11 December 2008, the WAI released the WCAG version 2.0 (W3C, 2008) to be up to date while being more technology neutral. Conformance to the WCAG is based on four ordinal levels of conformance (none, A, AA, and AAA).

Nevertheless, verifying a website's accessibility can be a time-consuming task and needs expert evaluators to validate. If the intention is to fulfill Web accessibility guidelines WCAG 1.0 and WCAG 2.0 or other national and international guidelines and laws (Jefatura del Estado de España, 2002; Ministro per l'Innovazione e le Tecnologie de la Repubblica Italiana, 2005; US Government, 1998) regulating and protecting the rights of disabled users to access information, the task can be very complex and time consuming.

To assure Web accessibility, several studies have suggested numerous evaluation methods (Brajnik, 2006; Bühler, Heck, Perlick, Nietzio, & Ulltveit-Moe, 2006; Vigo, Arrue, Brajnik, Lomuscio, & Abascal, 2007) as a means to verify, measure and certify the fulfillment of the accessibility guidelines and therefore to supply full accessibility to disabled people. Currently, there are two types of evaluation methods: analytical and empirical qualitative methods and quantitative methods.

The qualitative methods have been the most used until now, specifically the analytical ones, which are characterized by their low cost and ease of use. Automatic evaluation tools such as AChecker (ATutor, 2011), A-Prompt (University of Toronto, 2011), Cynthia Says (HiSoftware, 2003), EvalAccess 2.0 (Universidad del País Vasco, 2011), eXaminator (2005), TAW (Fundación CTIC, 2011), and WAVE 4.0 (Web Accessibility

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