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An exploratory study of library website accessibility for visually impaired users

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ABSTRACT

To extrapolate best practices for accessible library website design, the Web-browsing needs of users with visual impairments were investigated. Selected library websites were tested for usability and accessibility with six visually impaired persons who use screen readers. The results were analyzed in terms of accessible coding standards as well as high-level usability issues. The analysis results indicated that these library websites are not accessible for visually impaired screen reader users. The most common accessibility barriers encountered were issues of information architecture and usable Web design, rather than errors in coding. Suggestions to improve accessibility are proposed.

1. Introduction

Within the library and information science (LIS) field and profession, equal access has been emphasized as one of the foundational principles of intellectual freedom and participation for members of society (American Library Association, 2004; International Federation of Library Associations and Institutions, 2015). Now that digital formats are the de facto standard for information exchange, the equitable provision of online information services to all types of users is an increasingly critical part of this mission, with library websites serving as an important access point to online resources for those who are disadvantaged in terms of information accessibility. This study was carried out with people who have visual impairments as an exploratory inquiry into the access challenges of an information-disadvantaged population.[1] The goal of the study was to acknowledge (or better understand) the current status of library website accessibility for an underrepresented user group (in this case, persons with visual impairments) and to explore the implications of the study findings to LIS practice as a means of promoting equity of services. The specific focus was on meaningful accessibility, in other words the usability, of online library resources for users with screen readers in the context of navigating library websites to access information.

2. Problem statement

For libraries, promoting Web accessibility is critical to creating an inclusive environment because it addresses structural information disadvantages experienced by people with disabilities. People with disabilities are one of the largest diverse library user groups who experience information disadvantages, as 18.7% of Americans have at least one disability, and 12.6% have a severe disability that could affect their ability to access the Web (Interactive Accessibility, 2015). However, much of the existing diversity literature in LIS focuses on race and ethnicity (Gabriel, 2013; Jaeger, Subramaniam, Jones, & Bertot, 2011), and there is little attention to the information needs and behaviors of people with disabilities, particularly with regard to technology and library services.

According to Jaeger and colleagues (Jaeger et al., 2011; Lazar & Jaeger, 2011), the rapid growth of information technology has had a marginalizing effect on many groups, including those defined by age, socioeconomic status, literacy, language, culture, geography, and disability. For people with disabilities, a typical example of marginalization through technology is the barriers they experience when trying to access the Web. People with disabilities are one of the largest minority groups not typically considered as a regular user group by Web developers, which means that their needs are not adequately factored into the design of websites and other Internet-based information services. Unfortunately, as access to these services is increasingly required for full participation in society, the impact of the problem on people with disabilities is increasing proportionately.

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[1] This study grew out of an MLIS course, Web Accessibility and Usability, offered at St. Catherine University in the spring of 2013. The course was designed to teach the technical aspects of website usability and accessibility through student testing of websites. The accessibility testing assignment for the course developed into a funded research project when students sought the opportunity to test websites with users of assistive technologies. In April 2013, students in the class received a research grant to conduct accessibility testing of library websites with visually impaired users, resulting in an extended student-faculty research collaboration with additional data gathering and analysis by a subset of the students.

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Libraries do not appear to be an exception to the rule when it comes to Web accessibility. A number of studies reveal that typical library websites are not truly accessible for people with various disabilities (Lazar & Jaeger, 2011; Lewis, 2013; Southwell & Slater, 2012). As library resources continue to migrate online, it is critical that library professionals address this problem more assertively or risk an increasing lapse in their mission to provide a diverse public with broad access to information. To that end, the study described here investigated accessibility problems on three library websites, with a focus on the gap between traditional definitions of Web accessibility, i.e., compliance with various coding standards, and the notion of accessibility as meaningful access, which is defined here as usability for people with disabilities.

3. Literature review

3.1. Web accessibility legislation

Title II of the Americans with Disabilities Act (ADA), passed in 1990, provides general guidelines on the legal protection and equal rights of persons with disabilities and requires the equal treatment of persons with disabilities by public agencies, including public and academic libraries (Vandenbark, 2010). Section 508 of the Rehabilitation Act of 1973, as amended in 2001, more specifically requires that US federal agencies make their information and services, including online information, available to people with disabilities so that they have access to the same information as those without disabilities (Thatcher et al., 2006). In addition, Section 504 extends this provision to all entities funded by federal money, which includes a number of public libraries and their websites (Thatcher et al., 2006).

At present, there is no federal provision requiring accessibility for all websites. Providenti and Zai (2007) investigated whether the legal mandate for website accessibility could apply to academic libraries, and concluded that there is not a clear mandate, although the potential exists for indirect enforcement through Section 508. However, a recent decision by the Department of Justice may result in the introduction of new rules in Title III of the ADA that would extend the website accessibility requirements to all "websites of public accommodations," whether federally funded or not (Federal Register, 2014). These new rules, which are expected to be introduced in 2018 (Department of Justice, 2015), would mandate the accessibility of public accommodations websites such as e-commerce, tax preparation sites, schools, and public libraries (Vu & Launey, 2015).

3.2. Accessibility standards and guidelines

In general, accessible Web design seeks to meet the needs of people with disabilities coming from diverse backgrounds and possessing a wide range of abilities. The WAI (Web Accessibility Initiative) of the World Wide Web Consortium (W3C) is the leading organization establishing standards and requirements for accessible Web development, including the Web Content Accessibility Guidelines (WCAG). Using WCAG as a yardstick, Thatcher et al. (2006) and Horton and Quesenbery (2013) have pointed out many technical barriers to accessibility in current Web design, such as the lack of a basic text alternative (alt text) for images, the use of invalid or poorly structured HTML, which can lead to a cluttered experience for users or misrepresentation of content types by a screen reader, the improper use of color contrast, the inappropriate use of HTML headings, and the absence of skip links that allow blind users to bypass redundant navigation elements appearing on every page.

WCAG 2.0 represents an effort to make accessibility guidelines technology-independent, and in doing so, eliminates many of the specific directives found in version 1.0. The guidelines are broad in scope and can potentially result in a very comprehensive analysis of a site's accessibility; however, Vandenbark (2010) and Rømen and Svanæs (2012) assert that this lack of specificity results in ambiguity for developers using such guidelines as a baseline to create accessible websites.

3.3. Libraries, technology, and accessibility

Providing evidence of the accessibility challenges found on library websites, a study by Comeaux and Schmetzke (2013) found that between the years 1996 and 2006, academic library websites reduced accessibility coding errors from 5 per page to 1.7. However, since 2006, improvement has stagnated, with two out of five academic library websites still plagued by WCAG Priority 1 errors. A study by Oud (2012) confirms libraries' shortcomings in accessibility compliance. Her survey of 64 academic and public libraries in Ontario found that the average library website examined in the survey contained 14.75 accessibility problems per web page.

The impact of inaccessible library websites extends beyond legal compliance or access barriers. Through the use of qualitative interviews, Copeland (2011) found that libraries contribute to the social construction of disability by failing to create accessible websites. Learned attitudes, as well as a lack of research, resources, and training, are seen as barriers to accessible services in libraries. Though libraries have made many strides over the past several decades, accessibility, especially in regard to technology, is far from universal. Including patrons with disabilities in the definition of diversity is a necessary step toward minimizing marginalization. However, as Jaeger, Bertot, and Subramaniam (2013) note, the literature on accessibility in the LIS field is rarely presented in the context of diversity.

3.4. Library website use for people with visual impairments

Visually impaired patrons using assistive technologies encounter many challenges in accessing digital materials on library websites. Southwell and Slater (2012) examined the accessibility of U.S. academic library digital collections and found that only 42% were readable using a screen reader, while 58% were not. The primary reason these digital collections were not screen-readable was the lack of a transcript or otherwise digitally readable text associated with the digitized materials. Southwell and Slater argue that institutional policies and mandates are necessary to achieve consistent accessibility for digital library resources.

3.5. Accessibility testing with tools and users

The W3C (World Wide Web Consortium, 2011) defines Web accessibility evaluation tools as "software programs or online services that help determine if a website meets accessibility guidelines." These tools conveniently allow Web developers to evaluate the conformity of a website to accessibility guidelines with minimal effort; however, such tools cannot verify the accessibility of websites or guarantee their usability in terms of true functionality for disabled users (Section508.gov, n.d.).

In spite of this limitation, accessibility problems are often seen as distinct from usability, which leads to the assumption that a standards-compliant site will function well for people with disabilities simply because it is free from accessibility coding errors. But for meaningful access to occur, accessibility must extend beyond a mere provision of access through standards compliance. It must also ensure that users can achieve the specific goals of their information need and use (Lazar, Olalere, & Wentz, 2012; Walting & Crawford, 2010). In this study, accessibility is defined as the quality of access that allows people with disabilities to actually use the content that is presented in a way that satisfies their information needs.

Nielsen (2005) drew the connection between usability and accessibility by arguing that accessibility testing should involve real users in conjunction with accessibility evaluation tools. In a Web accessibility primer for librarians, Riley-Huff (2012) emphasizes the difficulty of