Accessibility of E-Government Web Sites

A

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INTRODUCTION

The Internet has emerged as one of the most prevalent forms of communication. The gathering and sharing of electronic information are becoming essential elements of modern life. Therefore, it is important to ensure that people, especially those with disabilities, have equal opportunities to benefit from the Web, especially from online public services.

While many people describe the Web as a low cost, all encompassing, and far-reaching medium (Parker, 1997), it is really not accessible to everyone. The proportion of people with disabilities in society has been increasing due to the demographic trends long documented by many researchers (Barth, McNaught, & Rizzi, 1993; West, 1998). Nevertheless, government leaders have paid little attention to the needs of people with disabilities when planning and implementing Web projects, and hence many critical online public activities and customer services are not readily available to the disabled. In short, a critical challenge facing all governmental agencies is how to make the massive volume of information being published on public sector Web sites accessible to every citizen they serve.

BACKGROUND

The Web can be considered as a multifaceted mass medium that contains many different configurations of communication (Morris & Ogan, 1996). As Lynch and Horton (1999) pointed out, the originators of the Web intended the Web to be a device-independent method for exchanging documents across many different platforms. The glue that holds the modern Internet world together is the Web programming language, namely HTML (Hypertext Markup Language). The term "Hypertext" was first coined by Theodor Holme Nelson, a recognized ideologist of Hypertext, in reference to a radically new way of storing and viewing information. Instead of gathering or retrieving information sequentially, information recorded with Hypertext is fashioned in multiple layers. An automated index is built into the Web document. The intertextuality and non-linearity of HTML enable Web pages to connect various virtual contents with specific "links" which allow online users to move among points and "nodes" (Howell, 1992).

The use of Web technology often has particular potential benefits for many people with disabilities. For example, for people who are visually impaired, the earlier text-based Internet sites opened a world of information that was previously off-limits. "For the first time in history, it is now possible for many people with disabilities to get information right from its original source (rather than waiting for Braille translations, etc.)" (Christensen, 2001, p. 30).

Unfortunately, with their focus on structuring and sharing documents, the originators of the Web ignored the visual logic or graphic design aspects of Web information delivery that are now stymieing blind users today. Due to the fact that the Web continues to increasingly embrace colors, graphics, motion pictures, audio, and the other dynamic elements, the current Web design practices have caused more difficulties for disabled individuals trying to benefit equally from society. A recent study shows that the usability of most current Web sites is on average three times higher for users without disabilities than for those who are blind or have low vision (Nielsen, 2001). Another research project published by Forrester Research (Souza & Manning, 2000) found that only one in four e-commerce sites it surveyed met even minimum requirements provided by the Web Accessibility Initiative (www.w3.org/WAI/) for disabled Web users, such as providing text descriptions of images for the blind. Waddell (1998) calls the Web "the growing digital divide in access for people with disabilities." Even in the public sector of the U.S., where Web accessibility is legally mandated, a significant number of official Web sites still contain features that do not provide reasonable access to disabled users (Gant & Gant, 2002).

Web pages are more than printed pages posted electronically. The Web offers many new opportunities as well as challenges to modern organizations (Mitra & Cohen, 1999; Parker, 1997). First of all, the Web makes it easy to transmit information in a timely fashion. Changes to a Web site can be published in a relatively short time when compared to the lengthy processes of redesigning, production, and distribution processes that are necessary for most printed media. Secondly, Web pages can

include larger amounts and a greater variety of information without incurring major printing and distribution costs. On the Web, costs do not necessarily increase as the amount of information being communicated increases. Furthermore, multimedia objects, including drawing, photographs, animation, sound, video, and computer applications, can be incorporated into Web pages at a low cost to enhance the Web's communication effects.

One Web characteristic that sets Web development apart from traditional media design is the lack of control. Unlike designers of printed media, a Web designer somewhat loses control over how online users will browse through the pages, the appearance of the fonts and colors used on a page, and the size, proportions, and exact locations of the different Web texts. On the Web, users largely determine their own navigation paths, and they are free to "jump" to any location that interests them. In addition, designers cannot know the exact computer equipment that the various potential users have, or what fonts and software have been installed in the users' computers. The exact way WWW pages present information would be partly determined by the users' own environment.

Therefore, Web content should ideally be designed in a way that the users using different agents (for example, desktop computers, mobile phones, televisions, PDA, etc.), with different Web browsers (for example, Lynx, Netscape Navigator, Internet Explorer…), and under different constraints can all access. In short, Web accessibility is not only concerned with disabilities, but also with the ideal that anyone using any kind of Web browsing technology can access and get full and complete information within it (Letourneau, 2000).

REASONS FOR PROVIDING WEB ACCESSIBILITY

There are more than 750 million people with disabilities worldwide. As noted earlier, at a time when the number of people with disabilities is increasing as the population ages, our society has become one that depends more and more on computers and digital technology for work, education, and entertainment. Participating in the digital economy by definition requires the ability to access and use the Web. It is hence important to make every possible Web site accessible. As the director of World Wide Web Consortium and inventor of the Web, Tim Berners-Lee (http://www.w3.org/WAI/), stated, "the power of the Web is in its universality. Access by everyone regardless of disability is an essential aspect."

In addition to common human decency, the most obvious reason to make governmental Web sites accessible to the disabled is to comply with the law. The Americans with Disabilities Act (ADA), Section 508, and similar laws and regulations in other countries (Paciello, 2000, p. 39-44) often mandate the establishment of means to allow the disabled access to the same information and use of the same tools as anyone else on the Web. For example, the ADA requires "reasonable accommodations" and "effective communication" in areas of employment, public services, and telecommunication services. With the popularity of e-government and e-commerce, the foci of the law have changed to include the Internet (Sager, 2000). Section 508 of the Rehabilitation Act defines the processes used by the federal government to procure electronic and information technology. One of the most important foci of the law is to ensure access to electronic and information technology made available to people with disabilities who are federal employees or members of the general public. In Canada, the Equity and Diversity Directorate of the Public Service Commission was the first national institution to publish Web accessibility guidelines to ensure that all governmental Web pages and associated electronic data was accessible to every Web user.

Although most countries in the world have not yet developed specific laws or regulations regarding Web accessibility, many have enacted legislations and governmental regulations similar to the ADA of the U.S. Until recently these laws and regulations are mainly concerned with the topics of employment, transportation, and public facilities. However, it is only a matter of time before most governmental Web sites worldwide come under political and legal challenges for not being accessible to the disabled. It seems likely that in time the Web-based services will be held to the same standards as the services or facility architecture of the physical world in the courts.

Moreover, making a Web site so accessible could be a competitive advantage economically. Many companies have found that creating accessibility on their Web sites is cost-effective and generally good business practice (Solomon, 2000). According to a report published by Forrester Research (Souza, Manning, & Dorsey, 2001), Global 3,500 companies are estimated to spend $560 million to retrofit their Web sites to meet W3C Web Accessibility Initiative guidelines. E-commerce companies, such as Amazon.com, are making their Web sites accessible so as to gain a share of the $175 billion in discretionary income controlled by consumers with disabilities (Amazon.com's press release December 6, 2001; Prager, 1999). Sixty-eight percent of consumers between 45 and 54 years old are online and nearly one-fourth have a disability (US Census). The authors conclude: "Companies must plan site design projects keeping people with disabilities in mind. Doing so is cost-effective—especially if accessibility is part of the planning, development, and maintenance process."