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Danger, danger! Evaluating the accessibility of Web-based emergency alert sign-ups in the northeastern United States

Brian Wentz [a,*], Jonathan Lazar [b,c], Michael Stein [d], Oluwadamilola Gbenro [e], Edwin Holandez [e], Andrew Ramsey [e]

[a] Department of Management Information Systems, Shippensburg University, 1871 Old Main Drive, Shippensburg, PA 17257, USA
[b] Radcliffe Institute for Advanced Study, Harvard University, 8000 York Road, Towson, MD 21252, USA
[c] Department of Computer and Information Sciences, Towson University, 8000 York Road, Towson, MD 21252, USA
[d] William & Mary Law School, Harvard University, 1515 Massachusetts Avenue, Cambridge, MA 02138, USA
[e] Frostburg State University, 101 Braddock Rd, Frostburg, MD 21532, USA

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ABSTRACT

People with disabilities need access to emergency-related information at the same time that the general public receives that information. Many county and municipal-level governments suggest that citizens sign up on a Web page to receive emergency alert information. While the messages being sent out via e-mail or text message might be accessible, the sign-up processes are often inaccessible, preventing people with disabilities for signing up for these important information services. In this paper, all of the county-level emergency alert sign-ups in Massachusetts, New York, and Maryland, were evaluated for accessibility. A total of 156 evaluations took place (6 evaluations for each of the 26 counties evaluated). Of the 26 counties evaluated, 21 of them had accessibility violations. Legal, policy, and design-related implications are presented in the following discussion.

1. Introduction

Many municipal, county, and state governments offer emergency alert services, where citizens can sign up to receive an e-mail or text message with information about weather, flooding, or other emergency events. Access to this emergency information is vital for public safety. The most convenient approach to register to receive emergency alerts is through a Web-based registration form. Some local and state governments use third-party Web interfaces to manage the registration and account information for their citizens. It is important to evaluate the accessibility of the Web-based registration processes for people with disabilities, since historically, people with disabilities are often not considered when electronically communicating emergency information to the public (Waterstone & Stein, 2006). When planning for emergencies, the technologies used by government and emergency respondents (such as GIS mapping), often do not include any information about the location of people with disabilities, disability-related barriers, or organizations that serve people with disabilities (Enders & Brandt, 2007).

It has been informally reported that many emergency alert systems have sign-up processes that are inaccessible to many people with disabilities. In one high-profile instance, the home page of FEMA, the Federal Emergency Management Agency, had been inaccessible to blind people who use screen reader technology (Olalere & Lazar, 2011), but it has since been fixed. The purpose of this paper is to discuss the legal status of accessibility of Web-based emergency alert sign-ups, and then evaluate all of the county-level emergency alert sign-ups of three states in the Northeastern US.

1.1. Background literature on Web accessibility

People with various disabilities often use different types of assistive technology to access Web-based information. For instance, blind users may utilize a screen reader, which will take what appears on the computer screen, and provide computer-synthesized speech output. Deaf or hard of hearing users may utilize captioning or transcripts instead of audio. People with motor impairments that limit use of their hands may use a keyboard, but not use a pointing device (such as a mouse), may use an adaptive keyboard or may use no keyboard at all, instead using speech recognition or head tracking to control their computer (Lazar, 2007). Web site designers are not expected to design different Web site versions for each disability population, nor are they expected to add different features for each disability group. A set of international technical standards for making Web sites accessible for people with disabilities, called the Web Content Accessibility Guidelines (WCAG), has been in existence

* Corresponding author.
E-mail addresses: bwentz@ship.edu (B. Wentz), jlazar@towson.edu (J. Lazar), mastein@law.harvard.edu (M. Stein).

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since 1999. These technical standards cover all perceptual and motor impairments as well as some cognitive impairments, and are internationally considered the "gold standard" for making Web sites accessible (Loiacono, Romano, & McCoy, 2009). Most countries have laws or regulations related to disability access to Internet content, which either are technically identical to the WCAG, or are derived from the WCAG with only minor differences (Lazar & Wentz, 2012). For instance, in the United States, the US Access Board defines engineering specifications (and the related regulations) for disability access, including both physical architectural access and also access to Web content. The first versions of the technical specifications for US federal government Web content, which are the regulations for Section 508 of the Rehabilitation Act, were derived from WCAG 1.0. A new version of WCAG, 2.0 was officially released in 2008, and the US federal Government is currently going through a rulemaking process to update the Section 508 regulations (Olalere & Lazar, 2011). In the most recent draft, the US Access Board has indicated the new version of Section 508 (known as the "508 Refresh") will refer directly to the international standard WCAG 2.0.

Technical guidelines for Web accessibility have existed for over a decade, and there is currently a wealth of information available to Web developers to explain how to make their Web sites accessible. Furthermore, making Web sites accessible is not technically hard to do, especially for the simple Web-based forms typically used for emergency alert sign-ups. However, numerous studies have reported that U.S. government Web sites, at state and federal levels, are inaccessible (Fagen & Fagen, 2004; Jackson-Sanborn, Odess-Harnish, & Warren, 2002; Jaeger, 2006; Lazar et al., 2010; Loiacono, McCoy, & Chin, 2005; Olalere & Lazar, 2011; Yu & Parmanto, 2011). Governments around the world have had varying levels of success with Web accessibility (Goodwin, Susar, Nietzio, Snaprud, & Jensen, 2011), and the approaches that seem to lead to higher levels of compliance include either massive automated monitoring of government Web site accessibility (Mirri, Muratoir, & Salomoni, 2011) or public posting of accessibility results on a regular basis (Gulliksen, Axelson, Persson, & Goransson, 2010).

Given the gap between existing knowledge and technical ability, and actual practice, Vint Cerf, the president of the Association for Computing Machinery, even wrote an article asking "Why is Accessibility So Hard?" (Cerf, 2012). Numerous reasons have been presented as possible explanations for such a low level of government Web accessibility. These explanations include: a gap of almost 10 years in compliance activities at the US federal level, a lack of a requirement to document activities related to accessibility compliance, clear technical guidelines but no guidelines related to process or procedures, and accessibility compliance responsibilities being added on to government employees who already have full-time jobs (no resources or time provided for compliance activities) (Olalere & Lazar, 2011).

There is often more expertise about IT accessibility at federal and state levels, as compared to local levels of government, such as towns, cities, and counties. Yet, the average citizen interacts more often with their local government (for water bills, fire and ambulance service, public schools, public libraries, trash collection, etc.) than their state or federal government (Lazar & Wentz, 2012). Although state IT accessibility can sometimes be similar to federal IT accessibility (Yu & Parmanto, 2011), at no point has there been any documentation of local (city or county) IT being superior in accessibility. So, in some ways, it is not surprising that local governments may have challenges in IT accessibility.

While there is a lot of published research about inaccessible Web sites in general, there are no published studies about accessibility of emergency-related information via electronic means. However, in the following section, there are references to research relating to the more general topic of legal issues related to providing emergency-related information to people with disabilities.

1.2. Background literature on emergency information access for people with disabilities

Both the Rehabilitation Act and the Americans with Disabilities Act (ADA) prohibit state and local governments in the US from discriminating against individuals with disabilities. Section 504 of the Rehabilitation Act bans "any program or activity receiving Federal financial assistance" from excluding equal participation by people with disabilities in funded programming (US Department of Justice, 2012). Title II of the ADA declares that "public services and programs must be accessible to people with disabilities" (US Department of Justice, 2008).

Consequently, courts have found that not including people with disabilities in disaster preparation and evacuation plans violates both those federal laws. For example, in two recent federal court cases, a California district court held that the City of Los Angeles violated both federal laws by failing to adequately serve the needs of some 800,000 individuals with disabilities through its emergency preparedness program (US Department of Justice, 2011), and a New York district court certified a class action against the City of New York on behalf of some 900,000 people with disabilities who were not sufficiently accommodated within disaster plans (US District Court, 2012).

Nevertheless, state and local governments have been sorely remiss as far as including people with disabilities in disaster preparedness. In April 2005, for instance, before either hurricane Rita or Katrina, the National Council on Disability released a report that examined the disaster experiences of people with disabilities and concluded that access to emergency public warnings did not satisfactorily include individuals with visual or hearing impairments. The report noted specific examples of such failures – including the lack of closed captioning during the September 11 attacks – and underscored that, although emergency e-mail and wireless network alerts can be helpful, they were not being used (Frieden, 2005). This situation existed despite an Executive Order issued by then-President Bush requiring state and local governments to design and implement emergency evacuation plans for persons with disabilities (Lord & Stein, 2010).

The glaring gap in inclusive preparedness for the disability sector tragically manifested in grievous harm following hurricanes Rita and Katrina. People with disabilities were not adequately warned of the impending disasters, were not taken sufficiently into account as part of emergency evacuation plans, and were not accommodated post-disaster in government sponsored relief efforts (Waterstone & Stein, 2006). The federal government has subsequently responded to this egregious oversight by establishing an Interagency Coordinating Council on Emergency Preparedness and Individuals with Disabilities, periodic reviews of emergency preparedness by the Department of Homeland Security, and the creation by President Obama of a disability focal point position at FEMA (Federal Emergency Management Agency). The change in FEMA is obvious when you consider that since 2010, the Office of Disability Integration and Coordination has grown from one disability coordinator to a staff of over 70 disability integration advisors working to improve coordination and communication for people with disabilities, before, during and after emergencies. While FEMA is a US federal-level agency, it is important to clarify that the emergency alerts referred to in this report are implemented at the local government level, not the federal level (Federal Emergency Management Agency, 2013).

2. Research methods

There are typically two different approaches for evaluating the accessibility of Web sites accurately: expert inspections and user testing. Expert inspections involve experts in accessibility, using a structured method to inspect a series of Web pages against guidelines (Lazar, Olalere, & Wentz, 2012; Lazar, Wentz, et al., 2012; Lazar et al., 2010, 2011; Wentz, Bittle, Hidey, & Vickers, 2013, Wentz, Cirba, Kharal, Moran, & Slate, 2012). Usability (user) testing involves people with disabilities attempting to complete representative tasks. User testing is