Accessibility Requirements for Government Websites

David R. Hankes

School of Computing and Digital Media, DePaul University

243 South Wabash, Chicago, IL, 60604

drhankes@gmail.com

ABSTRACT

The promise through the Obama Administration to the American public was to develop quality government services while striving to become more transparent, therefore leading to more efficient and effective information to all end users. As government strives to attain these goals and focuses on the needs of every citizen; have they been mindful of those users who have accessibility barriers to the same information? It is essential that all citizens have the same equal access to all government resources. In addition, agencies should continue to evaluate their informational service needs while planning and implementing their digital strategies. This paper looks into the history, requirements, technologies, non-accessible material, and best practices of today while also looking at the progression of this movement throughout history.

KEYWORDS

Assistive technologies, government, handicapped persons/special needs, web-based services

INTRODUCTION

In the United States, 54 million people have some type of disability, and that number worldwide is closing in on more than 550 million [20,10]. The number of users with disabilities will continue to grow as our ever-aging baby boomer generation moves into their retirement years. As the general public continues to engage in online experience through web, social, or multimedia; we can only assume the information these services provide should also be accessible by those with disabilities.

The Civil Rights Act of 1964 created federal and state laws that legally protect and prevent discrimination towards groups of people with common characteristics *(protected class)*. However, persons with any condition or disability *(physical, sensory, or cognitive)* that makes it difficult to perform certain activities, have been treated differently than any other protected class in the United States.

Since the inception of the Internet and its emerging technologies, those that helped enact disability rights laws suddenly found the inaccessibility of online services and their enforcement a challenge like no other minority group had experienced. Disability rights laws are built upon a premise that "rights are only available if one is a member of the class. Therefore, people with disabilities are the only group that has active responsibility under the law to enforce their own rights and petition for equality when it is not already available [31]."

Government involvement and collective technologies have made public generating and information gathering simpler by the expansion of the Internet. Through emerging technologies, governmental agencies deliver services and information to citizens through the Internet. This means that paper records that were once locked away in vaults and obscure document warehouses are now digitized and distributed through government resources. These services, that are delivered using a web interface, have become such commonplace in recent years; [5] that one might ask whether accessible websites are designed to meet the user's needs, preferences, skills, and situations. If so, does this flexibility benefit people 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 [30]."

Jaeger describes in his findings "government agencies do not as a rule engage citizens in the development of their e-government services and resources. Rather, many applications are internally driven to meet cost savings and other government mandates regarding efficiency [4]." Since government agencies are not engaging their users for feedback on the desired services and resources, then how are they testing and making all resources accessible to all users within their community?

HISTORICAL REQUIREMENTS

Two federal civil-rights statutes were initiated to guide federal, state, and local agencies into making information technology available to Americans with disabilities. The Americans with Disability Act (ADA) of 1990 and Section 508 of the Rehabilitation Act of 1973, as amended in 1998, prohibited places of public accommodation to discriminate against people with disabilities [12,14,17].

An international organization of Internet standards was created in 1994, the World Wide Web Consortium (W3C). The newly formed organization and its members looked to create "compatibility and agreement among industry members in the adoption of new standards defined by the W3C [34]." Two years after the creation of the W3C, they established guidelines, the Web Accessibility Initiative

(WAI), which explain how Internet content would be made accessible to people with disabilities. Tim Berners-Lee, Director and inventor of the World Wide Web, said "the power of the Web is in it universality. Access by everyone regardless of disability is an essential aspect [25,35]."

This group's focus was to increase accessibility for persons with disabilities on the Web. WAI's guidelines, commonly referred to as the Web Content Accessibility Guidelines (WCAG), describe web accessibility as having three connecting foundations: "(i) the content accessibility of websites for persons with disabilities to perceive, understand, and use; (ii) making Web browsers and media players usable for persons with disabilities by making them operable through assistive technologies and (iii) Web authoring tools and technologies to support production of accessible Web content and sites, so that persons with disabilities can use them effectively [30]."

Lazar supports the W3C's foundations by comparing a properly accessible website to that of an accessible building. He states that just as an "accessible building offers curb cuts, ramps, and elevators to allow a person with disabilities to enter and navigate through the building with ease [11]," so shall a website's navigation and content provide the same fluid movement throughout. If a website is considered inaccessible, than all the content and information available to the general public would already be considered less informational to those with impairments or disabilities.

In 1998, President Clinton signed Section 508 of the Rehabilitation Act. This law outlined that all electronic and information technologies that may be purchased, developed, maintained, or used; be fully accessible by people with disabilities. It describes that in order for websites to be fully accessible, they must be flexible enough to allow for various input and output devices [8,9]. The anticipated solution was to add no additional code to a website, but rather if the initial markup and code have been implemented in such a way to allow for these various impairments, than those with disabilities would not feel the restrictions on the information for which they desire.

PROCUREMENT
As government agencies began utilizing content distribution by means of the Internet, looking for the right software and vendor to fulfill their needs would require a procurement process. Government purchasing agents use this process to discover, agree to terms, and obtain goods, services, or work by means of competitive bidding. The U.S Federal Access Board stated that June 21, 2001, all federally signed contracts would be required to comply with 508 Standards. This means contractors, suppliers, and their entire supply network would be required to certify their products compliance [16].

However, no accepted tests by vendor or government agency existed that could certify compliance or conformance to Section 508 guidelines. Therefore, the General Services Administration (GSA) partnered with the Information Technology Industry Council (ITI) in 2001 to develop and address contracting and procurement issues with vendors trying to fulfill the requirements of Section 508 with their products [23].

The GSA and ITI created the Voluntary Product Accessibility Template®, or VPAT®. The template's purpose is to 1) document a vendor's product conformance with accessibility standards set forth by Section 508 of the Rehabilitation Act, and 2) assist procurement officials and buyers when making initial assessments of commercial software accessibility support [23,24]. The VPAT contents are structured in tabular format. The template provides detailed information regarding Section 508 standards and requirements to the procurement official from the soliciting vendor. The document contains a summary report describing the overall level of compliance with Section 508 Standards; then details each subsection of the Standards using line item summaries of the product's level of support for a specific guideline, and comments on how the product *did* or *did not* comply with each standard.

Optionally, if a vendor does not have a VPAT document for their given service or application, the contract or procurement official may create a Government Product/Service Accessibility Template (GPAT) and attach it to their request for proposal (RFP). The GPAT identifies the applicable Section 508 provisions for many Information and Communication Technology (ICT) deliverables through a process by which the vendor indicates how their product or service addresses accessibility requirements of Section 508 Standards. Since a GPAT is part of an organization's procurement process, it helps government agencies identify present and future vendors in their market research for accessible public facing services or applications [33,32].

CURRENT TECHNOLOGIES
There are numerous accessibility tools that are available in both commercial and open source varieties. Searching the web, one will find tools like AChecker, aXe, HTML Code Sniffer (AATT), WebAIM (Color Contrast Checker), and WebAIM (Wave) for websites. As for PDFs (portable document format), Adobe Acrobat XI and greater has a tool built in to test for accessibility. Many others are listed on the World Wide Web Consortium (W3C) list of accessibility tools [28] and the General Services Administration (GSA) Section 508 site for creating accessible electronic documents [17].

These accessibility tools can be very useful to designers and programmers whether or not their sites follow the Web Content Accessibility Guidelines (WCAG) [26,27]. They encourage the use of these tools "during the design,

implementation, and maintenance phases of Web development. If these tools are used carefully, it can help the targeted users in preventing accessibility barriers, repairing encountered barriers, and improving the overall quality of Web sites [2]."

BEST PRACTICES

In order for users to engage in government services and resources without barriers, agencies must take an in depth look into the strategies needed for integrating and designing the information and service needed by their end users.

Many laws that have been enacted, empower a retrofitting culture of mandates that are designed or implemented after the delivery of information rather than building it into the early planning stages or long range planning [6,13]. If the Internet of today is to fulfill a promise of providing levels of inclusion for individuals with disabilities, then equal access without barriers needs to be addressed and eradicated. Mechanisms built into the development, iteration, and deployment of these services would be better for all users had they been integrated from the onset of creation [10,4,1].

Conduct User Needs Assessments

A government agency should include assessments to better understand their end users' needs. 1) Identifying technology needs can determine barriers towards the use and delivery of content and resources to the end user, therefore addressing and limiting accessibility issues; 2) determine and evaluate content needed to support end users in their quest for information; and 3) understand your end user's knowledge about the domain and whether the services and/or resources fulfill their goals.

Before designing the ideal government service, agencies need a better understanding on how their visitors seek, acquire, solicit and use the information accessible on their website. Discovering these benchmarks enables governments to know how their visitors find and use information, as well as the sources they use [4].

Engage Users

Governments need to continually evaluate their online practices, while enhancing their existing services. Including the end user into online services can help diminish barriers and create beneficial feedback. Conventional methods of focus groups and interviews can be an avid starting point, which later spring boards into functionality, usability, and accessibility testing.

Functionality testing tells how well the agency implemented and fulfilled the functions of their site. Measuring functionality can happen through the use of basic search functions, monitoring how users complete online forms, examine satisfaction levels of document delivery, use of multilingual features, and advanced features used while engaging with the site.

Usability testing determines whether the site works in the manner that it was intended and provides adequate results. Users should be able to intuitively access various elements, discover how to operate and interact based on meaningful instructions, and define efficiencies and memorable areas and levels of completeness.

Accessibility testing employs how inclusive the site is for all users, including those with disabilities. Depending on the severity or type of disability, the site should engage the user by working with various assistive technologies and not exclude them [3,4,10].

Ongoing Content Compliance

While interface guidelines are available through searching the Internet, like WCAG and Section 508, what is not available is the ability to instruct webmasters and content producers/creators on how to continually maintain levels of accessibility.

Since current websites are not static and are continually updated through countless emerging technologies (*front-end frameworks, JavaScript libraries, APIs, etc.*) or extended services (*Facebook, Twitter, Snapchat, Instagram, etc.*); studies have shown that over time, as more complex and newer content gets added, the number of accessibility violations begin to rise. Therefore, webmasters and content producers/creators need to continually meet accessibility standards.

Flaws that may not be present in the initial design, but added over time through HTML/CSS code, visual enhancements, additional sections, or supporting/related documentation begin to inject levels of inaccessibility. It is important to document in the form of an accessibility policy, what features exist on the website and how often they are evaluated for accessibility [15].

Since the W3C states that "your web accessibility policy may be standalone or integrated into other policies, such as non-discrimination or equal opportunity policies. Ideally web accessibility should also be reflected in related documents, such as brand guidelines, coding standards, and project management frameworks. This helps accessibility to be considered as a core feature rather than an afterthought [29]." Therefore, a properly composed accessibility policy helps webmasters and content producer/creators define levels of transparency regarding 508 compliance and give instructions/actions on reaching their accessibility goal.

A well written accessibility policy should 1) reference specific 508 standards based on your organization's defined level of accessibility; 2) provide a realistic and achievable level of conformance that guarantees policy success; 3) define a clear scope and how it applies to all areas of your website; 4) set measurable conformance milestones, defined

by specific dates and updated when achieved; 5) describe how you monitor and/or review third-party content, procured or syndicated, for accessibility and how you provide accessible alternatives, and 6) define how and when your organization monitors, reviews, and ensures accessibility compliance [29].

RECENT REQUIREMENT CHANGES

In March 2010, the U.S. Access Board released a new version of a draft that would add new guidelines to Section 508 and made them available for public comment. This task was to promote, update, harmonize, and refocus the requirements of technology at its related functionality.

In the fall of 2010, President Obama signed into law the 21st Century Communications and Video Accessibility Act of 2010. This law added further requirements for emergency information provided to individuals who were blind and with low vision; strengthened closed captioning technology by means of manufacturers and broadcasters through the Internet; added advanced communications for text and email services; Internet access and services through mobile devices, and mandating all sized devices the ability to perform the above functionality.

During this same timeframe the Department of Justice (DOJ) stated that they would start to promote Internet access for individuals with disabilities, including accessibility to government websites. During the summer of 2010, the DOJ began querying government agencies as to the level of accessibility of their sites as stated by Section 508. This was the first time in many years that the DOJ began efforts on compliance by surveying organizations required by the law.

In February 2011, the Attorney General issued a statement that all federal departments and agencies would be part of a survey conducted by the DOJ in order to complete the original Section 508 report. In September 2012, the Attorney General issued the report detailing the findings from Section 508 requirements.

The survey requested data in four major areas: the general "processing for implementing Section 508, procurement, administrative complaints based on civil actions, and website compliance [18]." The findings regarding website compliance found only fifty-eight percent of agencies performing routine automated or manual processing on their websites.

These findings prompted the DOJ to make the following recommendations: 1) agencies must establish accessibility policies and procedures to ensure all developers follow the requirements set forth by Section 508 and the Accessibility Standards; 2) agencies must ensure their above policies and procedures include guidance regarding commonly used elements like PDFs, video, audio, scripting, text files, data tables, links, and electronic forms; 3) agencies should

describe in their policies and procedures their process for testing accessibility of the agencies webpages; 4) agencies should develop and publish an accessibility statement detailing how the agency performs the process of maintaining web accessibility; and 5) agencies should publish email addresses to allow for individuals with disabilities to communicate any accessibility problems they encounter on the website.

Since the DOJ's issuing of these recommendations, many accessibility tools, the Internet, and assistive technologies have implemented more advanced features. In April 2016, the DOJ withdrew their 2010 Notice of Proposed Rulemaking (NPRM) and reached out for public comments on various issues to help shape and direct future rulemaking [7].

The DOJ engaged in public comment to seek information on potential applications of technology, setting alternatives for smaller public agencies, and to determine a cost and benefits on web accessibility that will help aid regulatory impact.

In addition, the DOJ anticipates measureable information from users on the benefits to persons with particular disabilities, how to measure these benefits, collect user experiences with individuals with disabilities, and finally find a way to measure the cost of web accessibility [19,31].

On January 18, 2017 the Federal Access Board issued a final ruling updating the accessibility requirements for all information and communication technology (ICT) with regards to 508 Standards and accessibility. The Access Board set January 18, 2018 for all non-procured ICT, federal agencies, and contractors to comply with the updated 508 standards ruling [21].

Some of the changes include incorporating the Web Content Accessibility Guidelines (WCAG) 2.0, harmonizing with international standards to reach further accessibility worldwide, specify types of non-public facing electronic content that must comply, exempting content that meets current 508 Standards until it is altered, broadening accessibility for individuals impacted by vision, hearing, color perception, speech, cognition, manual dexterity, reach, and strength; and finally adding future standards to address ergonomics, hearing aid interfaces, handset audio, speech quality, audio description, accessible PDFs, and keypad arrangement. [21,22]."

CONCLUSION

The openness to comply with regulatory laws has taken a rather slow start. As Jaeger states, "Governments need to incorporate ongoing evaluation practices regarding their E-Government services to continually improve and enhance their services [4]." Therefore, by creating government websites from the outset to be accessible to all users by following Section 508 standards, it would take little to no

effort to maintain and improve one's existing services.

As the federal regulatory laws regarding accessibility get added and broaden our horizon of accessibility, inclusive design will increase the ability for people to obtain information and conduct electronic transactions, increase civic engagement and independence for individuals with disabilities, increase cost savings by reducing redundant business communications, and gain access to a larger pool of developers and content creators with accessibility knowledge [22].

REFERENCES

1. Abu-Doush, I., Bany-Mohammed, A., Ali, E., & Al-Betar, M. A. 2013. Towards a more accessible e-government in Jordan: an evaluation study of visually impaired users and Web developers. *Behaviour & Information Technology* 32, 3: 273-293. http://dx.doi.org/10.1080/0144929X.2011.630416

2. AKGÜL, Y. and Vatansever, K. 2016. Web Accessibility evaluation of Government websites for people with disabilities in Turkey. *Journal of Advanced Management Science* 4, 3: 201-210. http://dx.doi.org/10.12720/joams.4.3.201-210

3. Bertot, J. C., & Jaeger, P. T. 2006. User-centered e-government: Challenges and benefits for government Web sites. *Government Information Quarterly* 23, 2: 163-168. http://dx.doi.org/10.1016/j.giq.2006.02.001

4. Bertot, J. C., Jaeger, P. T., & McClure, C. R. 2008. Citizen-centered e-government services: benefits, costs, and research needs. *In Proceedings of the 2008 international conference on Digital government research* (pp. 137-142). Digital Government Society of North America. http://dl.acm.org/citation.cfm?id=1367832.1367858

5. E-Government Act of 2002. 2014. PUBLIC LAW 107–347. 2002. Retrieved April 27, 2017 from *The Department of Justice:* https://www.justice.gov/opcl/e-government-act-2002

6. Freire, A. P., Fortes, R. P. M., & Russo, C. M. 2008. The perception of accessibility in Web development by academy, industry and government: A survey of the Brazilian scenario. *New Review of Hypermedia and Multimedia.* 14, 2: 149-175. http://dx.doi.org/10.1080/13614560802624241

7. Gupta, V. 2016. Nondiscrimination on the Basis of Disability; Accessibility of Web Information and Services of State and Local Government Entities. Retrieved May 5, 2017 from the *U.S. Department of Justice, Civil Rights Division:* https://www.ada.gov/regs2016/sanprm.html

8. Jaeger, P. T. 2004. Beyond Section 508: The spectrum of legal requirements for accessible e-government Web sites in the United States. *Journal of Government Information* 30, 4: 518-533. http://dx.doi.org/10.1016/j.jgi.2004.09.010

9. Jaeger, P. T. 2006. Assessing Section 508 compliance on federal e-government Web sites: A multi-method, user-centered evaluation of accessibility for persons with disabilities. *Government Information Quarterly* 23, 2: 169-190. http://dx.doi.org/10.1016/j.giq.2006.03.002

10. Jaeger, P. T. 2008. User-centered policy evaluations of Section 508 of the rehabilitation act: Evaluating e-government web sites for accessibility for persons with disabilities. *Journal of Disability Policy Studies* 19: 24-33. http://dx.doi.org/10.1177/1044207308315274

11. Lazar, J., Dudley-Sponaugle, A., & Greenidge, K.-D. 2004. Improving web accessibility: a study of webmaster perceptions. *Computers in Human Behavior* 20, 2: 269-288. http://dx.doi.org/10.1016/j.chb.2003.10.018

12. Loiacono, E. T., & McCoy, S. 2005. Website accessibility: a cross-sector comparison. *Universal access in the information society* 4, 4: 393-399. http://dx.doi.org/10.1007/s10209-005-0003-y

13. Lopes R., Van Isacker K., Carriço L. 2010. Redefining Assumptions: Accessibility and Its Stakeholders. *Computers Helping People with Special Needs: 12th International Conference* (ICCHP '10), 6179: 561-568. http://dx.doi.org/10.1007/978-3-642-14097-6_90

14. Matthews, W. 2001. "Road to compliance", *Federal Computer Week* 15, 9: 22-28.

15. Olalere, A., & Lazar, J. 2011. Accessibility of U.S. federal government home pages: Section 508 compliance and site accessibility statements. *Government Information Quarterly* 28, 3: 303-309. http://dx.doi.org/10.1016/j.giq.2011.02.002

16. Prencipe, L. W., Achieving section 508 compliance. *InfoWorld* 23, 3: 61.

17. Section 508 of the Rehabilitation Act. 29 U.S.C. § 794d. 2000. Retrieved January 24, 2017 from the *General Services Administration on Section 508 Standards:* http://www.section508.gov

18. Section 508 Report to the President and Congress: Accessibility of Federal Electronic and Information Technology. 2012. Retrieved May 10, 2017 from the

United States Department of Justice Civil Rights Division: http://www.ada.gov/508/508_Report.htm#_Toc327291796

19. Statement Regarding Rulemaking on Accessibility of Web Information and Services of State and Local Government Entities. 2016. Retrieved May 5, 2017 from the *U.S. Department of Justice, Civil Rights Division:* http://www.ada.gov/regs2016/sanprm_statement.html

20. U.S. Census Bureau, 2010. "Americans with Disabilities 2010: Household Economic Studies." Retrieved January 31, 2017 from *U.S. Census Bureau*: http://www.census.gov/prod/2012pubs/p70-131.pdf.

21. United States Access Board: About the ITC Refresh. 2017. Retrieved May 29, 2017 from the *United States Access Board:* https://www.access-board.gov/guidelines-and-standards/communications-and-it/about-the-ict-refresh

22. United States Access Board: Final Regulatory Impact Analysis. 2017. Retrieved May 29, 2017 from the *United States Access Board:* https://www.access-board.gov/guidelines-and-standards/communications-and-it/about-the-ict-refresh/final-regulatory-impact-analysis

23. Voluntary Product Accessibility Template (1). 2017. Retrieved May 7, 2017 from *Wikipedia*: https://en.wikipedia.org/wiki/Voluntary_Product_Accessibility_Template

24. Voluntary Product Accessibility Template (2). 2017. Retrieved May 7, 2017 from *Accessibility - Information Technology Industry Council:* http://www.itic.org/policy/accessibility

25. W3C / Accessibility. 2016. Retrieved May 26, 2017 from *World Wide Web Consortium:* https://www.w3.org/standards/webdesign/accessibility

26. W3C / WCAG Overview. 2012. Retrieved April 26, 2017 from *World Wide Web Consortium:* http://www.w3.org/WAI/intro/wcag

27. W3C / Web Content Accessibility Guidelines (WCAG) 2.0 Recommended. 2008. Retrieved January 31, 2017 from *World Wide Web Consortium:* https://www.w3.org/TR/WCAG20

28. W3C Web Accessibility Evaluation Tools. 2006. Retrieved April 27, 2017 from *World Wide Web Consortium:* https://www.w3.org/WAI/ER/tools

29. W3C Web Accessibility Initiative (WAI): Developing Organizational Policies on Web Accessibility. 2016. Retrieved May 29, 2017 from *World Wide Web Consortium*: https://www.w3.org/WAI/impl/pol

30. W3C Web Content Accessibility Guidelines (WCAG) 1.0. 1999. Retrieved April 27, 2017 from *World Wide Web Consortium:* https://www.w3.org/TR/WCAG10

31. Wentz, B., Jaeger, P.T. and Lazar, J. 2011. Retrofitting accessibility: The legal inequality of after-the-fact online access for persons with disabilities in the United States. *First Monday* 16: 11. http://dx.doi.org/10.5210/fm.v16i11.3666

32. What do Vendors do with a GPAT? 2014. Retrieved May 9, 2017 from *GSA Government-wide Section 508 Accessibility Program*: https://www.section508.gov/blog/what-do-vendors-do-with-gpat

33. What is a GPAT? 2013. Retrieved May 9, 2017 from *GSA Government-wide Section 508 Accessibility Program*: https://www.section508.gov/blog/what-gpat

34. World Wide Web Consortium. 2017. Retrieved May 27, 2017, from *Wikipedia*: https://en.wikipedia.org/wiki/World_Wide_Web_Consortium

35. Youngblood, N. E., & Mackiewicz, J. 2012. A usability analysis of municipal government website home pages in Alabama. Government Information Quarterly 29, 4: 582-588. http://dx.doi.org/10.1016/j.giq.2011.12.010