

Analysis of UK Parliament Web Sites for Disability Accessibility

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Abstract: *The growth of the Internet has led to an increase in the number of public services offered by U.K. government entities on their Web sites. A variety of consumers use e-government sites, and those individuals with disabilities are guaranteed the same access government sites under the U.K.'s Disability Discrimination Act (DDA) of 1995. This law provides equality in access, and implements penalties for non-adherence to the law. Industry standards also exist which helps site developers to create better site accessibility. However, despite both standards and legal regulations, total openness of sites for people with disabilities is still not widespread. The purpose of this study is to examine the level of accessibility of a randomly selected sample of 130 members of the U.K. House of Commons. Each site was analyzed using an online software tool –Truwex - to determine if they met industry Web Content Accessibility Guidelines (WCAG) levels 1.0 and 2.0 standards and DDA law. The results showed that the majority of the sites did not meet either guidelines or legal mandates. Many of the sites displayed similar precedents when it came to the types of non-compliance, and could easily improve compliance with minor changes.*

Keywords: *Accessibility, Disability, e-government, WCAG, W3C, U.K. Disability Discrimination Act*

1. Introduction

As the number of e-government sites grows in popularity and usage, opportunities are broadened for individuals with disabilities to obtain a wide range of information and engage in online commerce. However, although Web sites can be designed to give more open access to these individuals, accessibility of sites remains a problem. In order to offer greater mobility, several initiatives have been started. First, international standards groups have created Web standards for developers to consider when building Web sites in order to improve accessibility. Second, the UK government has enacted the DDA law to make Web sites totally accessible to those users who have disabilities. However, even with enactment of laws and industry standards, fully accessible e-government Web sites remain rare.

2. Framework for Accessibility Needs

Henry (2005) states that there are a variety of factors endorsed by the W3C which contribute to the case that Web sites should be accessible: 1) Social factors, 2) Technical factors, 3) Financial factors, and 4) Legal and policy factors. The social factor case includes the right for all people to have access to the Web, including those with disabilities. With the increasing number of people accessing Web sites, including consumers with disabilities, this social factor plays a significant factor in ensuring the Web is available to all, otherwise those with disabilities risk being left further behind as the Web grows in importance. With regards specifically to e-government, Rubaii-Barrett and Wise (2008) indicate that these sites have a great potential for improving the quality of life for people with disabilities by providing more political participation and making government information more available.

A research report by the Office for Disability Issues estimates there are over 5.7 million people of working age in the UK who have some form of physical or mental impairment (Williams, et al, 2007). Of this number, 42 percent of disabled people are currently or have used the Web in the past. Although this number is smaller than 67 percent of the general public who has used the Web, it is still a sizable number of people who are using the Web for a variety reasons, including access to e-government sites (Williams, et al, 2007). Thus, a significant population of people with disabilities accesses Web sites, and requires that these Web sites provide assistive technology in order for this portion of the population to effectively access the pages. The term 'disability' can encompass the impairments of people with either physical or mental issues, but Web accessibility design most commonly addresses the needs of people with particular physical disabilities including:

- People who are blind who need to use screen reading technology or refreshable Braille

- People with vision impairments who use screen magnification
- People who have a hearing impairment who need to have sound caption
- People with a physical impairment that does not allow them to use a joystick, mouse, etc. (Brophy & Craven, 2007).

Another W3C factor which makes a case for overall Web accessibility for all groups is legal policy (Henry, 2005). Blue (2001) states that the internet can make a significant difference in the lives of those with disabilities, therefore, the aim of the government should be to enable as many people as possible to access the site. In order to equalize Web and other technical access for consumers with disabilities, many countries have enacted legislation to require a specific level of accessibility. The UK passed the Disability Discrimination Act (DDA) in 1995. Part III of the Act obliges providers of goods, facilities and services to provide equal access to all customers. Section 19, sub-section (c) of the DDA lists accessibility to and the use of information services, such as Web sites. In addition, sub-section (b) applies to access to and use of communications (Blue, 2001). Both of these sub-sections of the DDA clearly apply to use of Web services. The UK Cabinet Office (2003) published a report on affective Website design for government entities. The report also states that the DDA law extends to Websites, and encourages sites to adhere to W3C guidelines. Blue (2001) also mentions that the DDA law was amended in 2001 to require education providers with obligations not to discriminate and to make reasonable adjustments for those with disabilities, including ensuring Web sites are available to disabled students. The law is broad in that it covers providers in a variety of industries, including private, public and voluntary sectors, and covers all individuals employed in firms providing goods or services.

E-government refers to “the use by government agencies of information technologies, such as Internet sites, that have the ability to transform relations with citizens, businesses, and other arms of government” (World Bank, 2009). In order to meet the needs of the growing number of Web visitors, including those with disabilities, e-government sites need to ensure that their content is available to all consumers. Dynon & Dutton (2007) define accessibility in relation to e-government sites as obstacles to making e-government services available to those with physical disabilities. They conducted a research study to rank the perceived importance of barriers to using e-government sites. They found that most survey respondents listed resistance to change as the most important barrier to using e-government sites, and found that accessibility was the least important of the nine factors surveyed. However, although accessibility was ranked low, they still found a significant number of respondents, 42 percent, who indicated that making e-government services easily accessible to those with disabilities was important. Thus, there is a sizable number of Web users who view accessibility to e-government sites as a central factor in their usage, and desire elimination of barriers to use.

Friedman & Bryen, (2007) indicate that individual countries should not merely rely on guidelines and industry standards. Instead, individual countries need to enact their own standards or legislation because these legal regulations carry the force of the law rather than voluntary guidelines. Rubaii-Barrett and Wise (2008) also concur that the creation of policy alone is not sufficient to create proactive behavior, and legislation and technical monitoring should be enforced.

Web accessibility for users with and without disabilities has been an important factor since the Web's initial stages. Tim Berners-Lee, the founder of the Web and W3G director, has stated “The power of the web is in its universality. Access by everyone regardless of disability is an essential aspect” (Web Accessibility Initiative, 2008). In order to meet the needs of disabled users of Web sites, the World Wide Web Consortium (W3C), has developed various standards to encourage accessibility for those with physical impairments.

In 1999, the W3C established the first accessibility standard for the Web, WCAG 1.0. It comprises series of 14 guidelines, each having one or more checkpoints which are the basis for conformance to meeting the needs of those with disabilities. Each checkpoint is assigned a priority to determine the impact on accessibility. (W3C, 2008a). There are three priority checkpoint levels in WCAG 1.0:

- Priority 1: A Web developer must satisfy these requirements, and this is the minimum requirement.
- Priority 2: A Web developer should satisfy this checkpoint, but it is not mandatory,
- Priority 3: A Web developer may address this checkpoint.(W3C, 1999)

In order to further develop Web accessibility standards, W3G is working on an updated standard, WCAG 2.0. This version applies more broadly to various Web technologies and is designed incorporate future technology changes. It is organized around guidelines with criteria, and most sites already conforming to WCAG 1.0 should not have to make significant changes to conform to 2.0. (W3C, 2008a)

On April 30, 2008, the WCAG Working Group published the 2.0 version for “candidate recommendation.” The Working Group was satisfied with the technical content and the version has a broad support in the technical and user community. It is expected that the final draft of WCAG 2.0 will be available at the end of 2008 (W3C, 2008b). Until WCAG 2.0 becomes the formalized W3G recommendation for Web sites, developers should still continue to use the 1.0 working document as the standard when developing their sites.

Although Web designers should be aware of accessibility issues in meeting the needs of their customers, they often display a lack of understanding relating to the reasons for applying specific accessibility elements as well as knowledge of how developers implement them effectively (Brophy & Craven, 2007, p. 968). This has resulted in a few Web sites that comply to legislative requirements or meeting WACG standards. Also, because of a myriad of design and cost factors, many Web designers only attempt to meet the minimum W3G requirements. They often only attempt to implement priority one items in the guidelines, even though by doing so they do not address features critical for accessibility across all disabilities (Friedman & Bryen, 2007). For accessibility to be taken seriously and to close the digital gap, industry guidelines and legislation will have to be utilized, and sanctions imposed on government agencies that do not conform (Rubaii-Barrett & Wise, 2008).

Several studies have been done to test the level of Web site accessibility for UK sites. In August 2000, The Royal National Institute for the Blind (RNIB) tested 17 retail establishments and banks against Web site disability accessibility standards using the Bobby testing tool. They found that all banks, supermarkets, retail and fast food sites failed accessibility standard testing (Blue, 2001). A study of 300 UK museum, library and archive Web sites in 2004 found that only 42 percent of the sites met WCAG level 1 accessibility and only 3 percent met level 2 (Brophy & Craven, 2007). In 2004, research showed that of 370 UK government authorities failed to ensure their online recruitment pages met DDA requirements, resulting in 150,000 jobs withheld from people with disabilities (Woolfson, 2004). In 2005, a report produced by the e-Government Unit of the UK Cabinet Office found that “97% of official sites were unusable by disabled people, largely because they ignored well-known techniques for making data accessible” (BBC News, 2005). Only 3% of the sites that were studied passed basic W3C accessibility guidelines. Another survey in 2008 by the UK Public Accounts Committee found that in the past six years the quality of government Websites has only improved slightly and one in six has actually gotten worse, and one-third of sites failed to meet the Cabinet Office’s accessibility standards (Steward, 2008). These series of studies found in the research show a significant issue with government sites meeting basic accessibility for their disabled users.

3. Methodology

The research was accomplished through analyzing the sites of Members of Parliament (MP), specifically those in the House of Commons to determine their adherence to WCAG guidelines. As of October, 2008, there are 646 MP members in the House of Commons (BBC News, 2008). This research analyzed 130 (20 percent) of the total members.

There were two phases completed in this report. The first portion was to review an online accessibility tool, Truwex, to choose which factors to choose to determine the level of disability accessibility. The second phase involved analyzing the 130 MP Web sites with the Truwex tool to determine if the sites met WCAG standards and adhered to DDA legal requirements.

The initial project phase was to choose a software tool to analyze the sites and to choose the available functions in that tool to test for accessibility. Erigami has an online compliance tool named Truwex that Web designers can use to test their Web pages against several industry standards and legal regulations including: 1) WCAG level 1.0 for UK DDA, 2) WCAG level 2.0, 3) Web analytics validation, 4) German BITV check, 5) US Section 508 law, and 6) US Childrens Online Privacy Protection Act (COPPA) (Erigami, 2008c). A tester can choose one or more of these options and receive a detailed compliance report on whether the site meets or fails the test based on the specific option. Besides giving a pass or fail result, it also provides a detail of both critical guidelines deviations (errors) and non-critical issues (warnings) (Erigami, 2008a). This software has been used by other researchers to analyze disability accessibility of other e-government Web sites. In the Spring of 2008, the Government of Saskatchewan, Canada used Truwex version 2.0 to evaluate its Web site for WCAG standards. They used the results to understand how management could evaluate a variety of accessibility features and how developers could effectively choose which features to include in their site (Wu, 2008). The WCAG guidelines covered within the Truwex software tool cover a wide range of suggestions for making sites available for people with a range of disabilities including: blindness, deafness, learning disabilities, cognitive limitations, limited movement, speech disabilities and photosensitivity (W3C,

2008d). Thus, this study will compile a list of design issues for Web surfers who have a range of disabilities.

Erigami has both a downloadable version of the testing software and an online version. This is a free version where testers can enter their Web site Uniform Resource Locator (URL) link directly into the Truwex online text box. After entering their site URL, a tester then chooses one of several disability and Web quality standards to test. Since this study concentrates on UK adherence to DDA law and WCAG standards, the two options chosen to test were WCAG level 1.0 and WCAG level 2.0. The software analyzes all pages of the site and presents a diagnostic report on the number of detected issues and warnings indicating how well the site complies with specific accessibility standards. Issues are defined as serious non-compliance problems that should be fixed in order to be in compliance with the standards. Warnings are informational message about possible problems (Erigami, 2008b).

Although the software is robust in analyzing various accessibility issues against standards, researchers performing checks using Truwex should be cognizant of certain limitations. First, the color/background combinations are not a perfect fit for WCAG 2.0 Luminosity Contrast Formula (Erigami, 2008d). Second, Truwex supports the following browsers: a) Firefox, b) Internet Explore and c) Safari. Checks against other browsers, such as Opera, are not possible (Popov, 2008)

The 130 MP Web sites were chosen from an alphabetical list of 646 members of the House of Commons listed in the UK Parliament site at <http://www.parliament.uk/directories/hciolists/ahms.cfm>. The members were picked alphabetically with approximately every fifth member chosen from the alphabetic list. This selection allowed a wide range of various members, and included members from all political parties. One issue raised with this random selection was 83 of the 646 (12.8%) of the MPs did not have a listed Web site. Therefore, these members could not be included in the research study. The MP sites were chosen for evaluation because they are covered under the UK DDA law for accessibility. Since they are instrumental in legislating laws, such as DDA, this study was taken to determine if the owners of these sites do adhere to their own mandated legislation.

Two of the original sites chosen for analysis could not be evaluated using the online version of Truwex. The software could not process the URL for these sites and gave a timeout error. Therefore, two other MP sites were substituted.

4. Results

Table 1 shows a compiled report of accessibility testing run on 130 MP Web sites between November 12 and November 16, 2008. The table's first column shows various statistical categories, while the second column shows the specific results of WCAG level 1.0 testing, and the third column indicates the results for WCAG level 2.0. The first two rows of the table results show that for the 130 tested sites, there were a total of 217 failures, (or serious errors) and 1002 non-critical warnings for WCAG level 1.0 guidelines and 504 failures (serious errors) and 1415 warnings for level 2.0. Dividing these numbers by the 130 tested sites shows results for the average number of errors and warnings for each site. For WCAG level 1.0, the average MP site had 1.7 serious errors (failures) and 7.7 warnings. WCAG level 2.0 showed even more substandard results, with an average of 3.9 errors (failures) and 10.9 warnings for an average site. The range of serious errors (failures) ranged from 0 errors up to a maximum for 4 errors for any of the 130 sites tested for WCAG 1.0. Warnings ranged from a minimum of 4 warnings up to a maximum of 11 types of warnings under the WCAG 1.0 guidelines. For WCAG 2.0, there were some sites with no errors, with the largest number of errors being 8. Warnings ranged from a minimum of 6 warnings up to a maximum of 15 various types for the 130 tested sites.

Of the 130 sites tested, 30 met WCAG level 1.0 and DDA minimum requirements for meeting accessibility requirements and showed no failures (errors). All of the sites showed non-critical warnings under level 1.0 guidelines. The results for WCAG level 2.0 fared much worse, with only 7 sites reporting no failures (errors), and all sites showing warnings.

The detailed report findings showed a large variety of errors and warnings associated with each of the three standards. However, most of the sites that had errors consistently had the same kinds of problems:

- Missing alternative (alt) tags
- Clickable image without alt tags
- Low contrast text
- Device dependent event handlers

Table 1: Accessibility Results for MP Web Sites

| | WCAG 1 Results | WCAG 2 Results |
|---|----------------|----------------|
| Failure issues (total) | 217 | 504 |
| Warning issues (total) | 1002 | 1415 |
| Mean failure per page | 1.7 | 3.9 |
| Mean warnings per page | 7.7 | 10.9 |
| Range of failures per page | 0 to 4 | 0 to 8 |
| Range of warnings per page | 4 to 11 | 6 to 15 |
| Number of sites with no failures | 30 | 7 |
| Number of sites with no warnings | 0 | 0 |

5. Implications

Evaluation results in Table 1 show that the vast majority of MP Web sites do not meet either WACG 1.0 standards, which are the minimum requirements under UK DDA law. In addition, although the more stringent WACG 2.0 standards are not yet a requirement under the law, the W3G Working Group is working on a final draft of level 2.0 standards that will eventually become the industry guidelines. Web designers should keep this development in mind when creating or modifying their sites, including those in the e-government arena.

Although there were numerous errors and warnings for both level 1.0 and 2.0 in the report, there were several errors that were consistently found in most of the sites that contained errors. The two errors that showed up in most of the sites were missing alt tags and clickable images without alt tags. Alt tags are used to decipher the content of an image or picture on a site. It allows individuals with sight problems to be able to understand the meaning of the image by using screen readers to decipher the text associated with the image.

Web designers can do more to ensure greater accessibility by disabled individuals. Use of software testing tools, such as Truwex, is a first start to determine if a site meets accessibility and legal standards. Brophy & Craven (2007) suggest a mixture of development methods that follow W3C guidelines including:

- Using semi-automatic testing tools for validation
- Manual evaluation with standards for checkpoints and priority levels
- User testing of specific features using a group of individuals with a mixture of disabilities and abilities (p. 964)

Jaeger (2008) researched a variety of e-government sites for accessibility and suggests that there are a variety of user centered evaluation methods that government site developers can use in universal design. He suggests it is imperative that designers create sites accessible to all users from the outset, rather than attempting to make them accessible later. Like Brophy and Craven, he recommends sites should be tested by persons with disabilities during development rather than after implementation. (p. 31).

Although some authors state that sites should be properly designed before implementation, there are many sites where that has not been done and these sites require retrofitting. There are options that developers of these sites, including the UK e-government sites, could do to modify their sites to make them more accessible to persons with disabilities. First, modifying the sites to include alt tags for images could be accomplished relatively quickly. It could be done on a piecemeal basis when specific site pages need to be updated, and to include updating the alt tags for images on that page. Developers could also run accessibility reports with tools such as Truwex to determine other minor modifications that could be implemented gradually.

Although this research shows a dearth of user-accessible MP Web sites, there has been some improvement in accessibility with these sites. In November 2008, the British Computing Society

announced 2008 MP Web site award winners, which reviewed MPs who effectively used Web technologies to communicate to their constituents in an exciting and dynamic manner. The 2008 awards did highlight the importance of accessibility, and although they found that overall implementation was poor, there were improvements and among the shortlisted sites, some MPs were starting to use technology to effectively reach their disabled users (British Computing Society, 2008).

6. Conclusion

This research shows that a majority of UK e-government sites for members of Parliament are not adhering to disability legal requirements to provide their disabled constituents equal access to the site content. Disability law, the DDA, requires that UK sites to provide disabled persons comparable access to sites as those individuals without disabilities. Although the DDA law has been in existence since 1999, it does not correspond to actual adherence to the legal requirements. Few e-government sites come close to passing disability testing guidelines. The findings suggest that Web designers could implement some minor changes to their Web pages in order to improve their level of compliance with industry standards and legal mandates. Designers should also periodically monitor their sites, especially after making changes, and plan for future updates when laws or industry guidelines change. Meeting accessibility standards can benefit government officials by having their sites benefit a much larger range of their constituents who are increasingly using e-government sites.

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