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A LOOK AT ONLINE BANKING ACCESSIBILITY IN THE EU AND THE USA

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Abstract: Information Systems become the necessary tool for financial organisations. Online banking is now more than an ideal environment for standard banking transactions because it provides customers an easy access to a wider range of services and allows them to deliver more timely and cost-effective services around the clock. To meet the higher demands of the customers of today's global networked economy the websites of the financial institutions needed to be more accessible for people with disabilities. The significant number of disable people tends to be excluded from the use of World Wide Web as a mechanism by which services and facilities are provided. This paper reports on the e-Accessibility standards of online banking services and identified that despite standards and guidelines set by the international agencies like W3C many websites still fall short of e-Accessibility.

1. Introduction

Online banking greatly increases the convenience of banking services especially by making many services accessible virtually anywhere. Online banking transactions are much cheaper than branch or even telephone transactions. There are many difficult tasks of banking services that can be accomplished with a few clicks of buttons. Transferring money, arranging mortgages or paying utility bills are the main examples of these tasks. By providing such facilities the importance of the web

becomes especially evident to people with disabilities.

There is now a long history of attention being paid to issues of equal opportunities. Much early work in this area concentrated on race and gender issues, but disability has gradually forced its way higher up the agenda. As a result of the equal opportunities legislation of the last decades, and of the work of the pressure groups, disability has come to be seen as a rights issue. In today's age of pervasive computing, users have the ability to access information stored on powerful networks anywhere, anytime. Such things as personal

digital assistants (PDAs), smart phones, wearable computers and other mobile devices give the user instant access to global information systems (Jahankhani et al, 2002). The challenge is to ensure that the information from these devices takes into account both the user's capabilities and his/her device. Therefore by adapting video, images, audio and text to both individual devices and individual user requirements will help to ensure that people with disabilities can take advantage of the benefits of pervasive computing (Arrizabalaga & Smithers 2005).

Online banking is more than an ideal environment for standard banking transactions because it provides customers an easy access to a wider range of services and allows them to deliver more timely and cost-effective services around the clock.

The availability of more online services means less customers branch visits. Therefore the major and key issue of the online banking services is now e-Accessibility. The banking services are trying to provide a secure communication channels to make their sites more accessible but not necessarily for everyone. Almost all the banks are now aware of the importance of e-Accessibility as it makes good business sense to offer an online banking service that is easy to use for all the customers and in particular blind and partially sighted customers (Archer, 2003). In today's

modern era most of the banks are trying to develop the policy which can integrate with the WCAG 1.0 guidelines developed by the Web Access Initiative W3C.

The banks can only achieve a high level of web accessibility, by taking a forward looking attitude and a carefully considered design. Good practice proves that there is no need to sacrifice website's visual appeal and the impression it is intended to convey to its users to the legal requirement. Instead all criteria can be met as part of a balanced relationship.

2. Web Accessibility, Organizations and Laws

Web accessibility is the ability of users to access information and services from the World Wide Web. The World Wide Web Consortium (W3C) is a forum which develops standards and guidelines for World Wide Web and creates, reviews, and approves the technical specifications for the languages and protocols which forms the architecture of the World Wide Web. The main tasks of W3C is to lead the World Wide Web to its full potential by developing protocols and guidelines that ensures long-term growth for the Web and make sure the accessibility of the Web for all users through out the world. The Web Accessibility Initiative (WAI) is a working party developed by W3C which is supported

by U.S. Department of Education's National Institute on Disability and Rehabilitation Research, a non-profit research, training and public policy centre for disable people (Joe, 2005) European Commission's Information Society Technologies Program, Canada's Assistive Devices Industry Office HP, IBM, Microsoft Corporation, SAP, Verizon Foundation and Wells Fargo.

The American Disability Act is a federal law passed in July 1990 (ADA, 1990) that protects individual from discrimination with respect to employment, public service, public accommodation, services operated by private persons and telecommunication services. The initiative is specially designed to increase the access of the assistive technologies and increase the ability of the disable people.

The Rehabilitation Act 1973 requires all federally sponsored programmes in United States of America to be accessible for people with disabilities. It has been further mandated that all management policies must not discriminate in hiring, placement and advancement of persons with disabilities.

Section 508 of 1998 entitled "Electronic Equipment Accessibility", an amendment to the Workforce Rehabilitation Act of 1973, requires making sure that all "electronic and information technologies" (EIT), developed or purchased by the Federal Government, is accessible by people with disability. The law first came into force in June 2001, "In

1998, Congress amended the Rehabilitation Act to require Federal agencies to make their electronic and information technology accessible to people with disabilities" (Section 508, 2007).

3. e-Accessibility Level of Online Banking Services in EU and USA

Web Content Accessibility Guidelines (WCAG1.0) is now becomes the main standard in the design and developing area of websites standardized by the World Wide Web Consortium (W3C). This section provides the results of the accessibility tests that have been conducted on online banks from the EU and USA according to the Web Content Accessibility Guidelines (WCAG 1.0) Checkpoints of Priority 1, 2 and 3 by W3C, (WAI, 2001).

Several tools are available to check the accessibility of the Websites over the internet. These include Accessibility Check, Acc-Verify Cynthia Says, A-Prompt ATRC Web Accessibility Checker, Bobby Watch-Fire Web-XACT, Eval-Access, Hera, Hermish, Silvinha etc. The three basic concepts for the effectiveness of a tool are completeness, correctness and effectiveness (Brajnik, 2004). There are also other tools available that checks for e-Accessibility function. The list of these tools can be found at

<http://www.w3.org/WAI/ER/existingtools.html>

In this research Bobby Web-XACT tool is selected for assessment and validation of these websites. Bobby is one of the famous tools for assessment and validation of websites and brings the Website up to the required standard of Web Content Accessibility Guidelines (WCAG 1.0) and Section 508 of the US Rehabilitation Act. It is especially designed for small Websites to help and expose barriers of e-Accessibility page by page through Bobby Spider of the whole Website including readability by screen readers, animated elements, audio and video displays and the provision of text equivalent for all images. It checks HTML against select accessibility guidelines and then reports on the accessibility of each page. Bobby tool can spider the local Web pages as well as Web pages behind the installed firewall and is really ideal for large scale accessibility testing and perform over 90 accessibility checks during the assessment and validation of required Website. It was first released in 1996 and in July 2002 Watch-Fire Acquired from Centre for Applied Special Technology (CAST) and held the responsibility for its marketing and distribution. Originally Bobby was based on the Trace Research and Development Centre guidelines but when WAI introduced the WCAG 1.0 guidelines,

Bobby conformed to them. Now Bobby is to be considering one of the best and famous tools to test the accessibility standard defined by the WAI W3C. A window based version, Bobby 5.0, incorporates the scanning and reporting functionality of Watch-Fire Web-QA and includes the following enhancements:

- Spidering: Flash links, JavaScript parsing and execution, http(s), Session ID(s)
- Scalability: able to scan larger sites
- Reporting
- HTML Editor Integration
- Extensive Online Help: Explains why certain errors are reported as issue

Bobby is therefore has been selected as a key tool to generate this report. The tool is available at <http://webxact.watchfire.com/>

3.1. e-Accessibility of Online Banking Websites in EU

To find out the accessibility level of the European Union websites the research conducted 927 accessibility tests. Out of 927 websites 310 achieved the minimum level A conformance, 44 websites achieved the level AA conformance and 55 websites achieved the highest level of AAA conformance. The following graph illustrates this in percentage.

**Total Number of Websites of EU
checked for Accessibility level =
927**

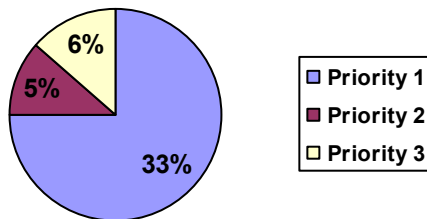


Figure 1, e-Accessibility of online banking
Websites of European Union

3.2. e-Accessibility of Online Banking Websites in USA

To check the accessibility level of the websites of USA online banking industry the research conducted 1049 accessibility tests. Out of 1049 websites only 134 achieved the minimum level A conformance, 24 websites achieved the level AA conformance and only 13 websites achieved the highest level of AAA conformance. The following graph illustrates this in percentage.

**Total Number of Websites of USA
checked for Accessibility level =
1049**

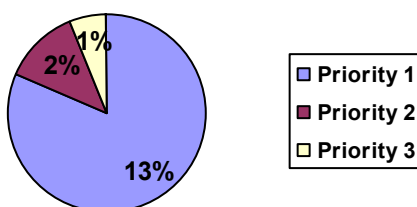


Figure 2, e-Accessibility of online banking
Websites of USA

3.3. e-Accessibility of Online Banking Websites in EU and USA

The analysis of above two charts i.e. figure 1 and 2 proves that only 22% Websites achieved the minimum Level A conformance of WCAG 1.0 while further 78% Websites failed to conform to this minimum Level A conformance. Only 3% websites achieved the Level AA and AAA conformance while further 97% Websites failed to conform to the level AA and AAA conformance of WCAG 1.0, a main standard in this area. The following figure 3 illustrates this.

**Total Number of Websites of EU
& USA checked for Accessibility
level = 1976**

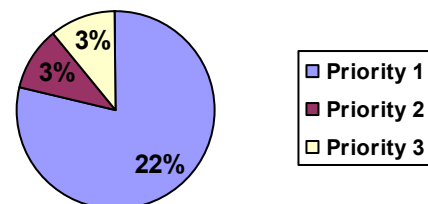


Figure 3, e-Accessibility of online banking
Websites of EU & USA

4. Discussion

The great challenge facing the web is to make sure that all developers and designers follow accessibility guidelines in providing descriptions that optimize access to end users with disabilities. There has been a lot of discussion on different forums regarding

e-Accessibility on the part of web developers and designers. This causes the development of a plethora of new software utilities and the interesting part of these utilities is that all are claiming to automate the process of evaluating and/or repairing web pages. The aim of all these utilities and tools are to assist the developer and authors of HTML to pin point the changes needed in the HTML coding to make sure and achieve the high level of e-Accessibility.

The available two sets of standards to achieve the goal of e-Accessibility used by developers of evaluation and repair products are Web Content Accessibility Guidelines 1.0 from the Web Accessibility Initiative (WAI) of the World Wide Web Consortium (W3C) that provides a priority based (Priority 1, 2 and 3) checklist of guidelines. This document is now used as a reference for evaluation and assessment of the e-Accessibility and web-based resources. In addition, the rehabilitation act amendments of 1988, section 508, covers access to United State Federal Agencies in making their electronic and information technology more accessible to people with special needs. An independent US Federal Agency, The Access Board, whose goal is to achieve the highest level of e-Accessibility, has established a "Guide to the Section 508 Standards for Electronic and Information Technology." As two of these standards provide the context for evaluation,

assessment and repair, a very little attention has been given to the role of authoring tools like HTML editors, in designing and development of accessible Web resources. Authoring tool is a mechanism that helps developers and authors of HTML with a limited knowledge of inclusive design practices. The lack of integrated authoring tools is the reason behind the development of other products that have been designed to examine the accessibility of websites after it has been designed and developed (Jahankhani & Safieddine, 2002). A wide variety of these products available in the market is responsible for determining how well a site accommodates the feature of e-Accessibility guidelines and choosing one product is really a difficult task. The reason behind this is because of the lack of comprehensive review mechanism for these types of software.

Although all of these tools play a critical and important role in ensuring the accessibility of the Web and perform a static analysis of home pages or sites regarding their accessibility, testing and validation of a website is still very important. A key point to understand with respect to accessibility tools is that these tools can only partially check the accessibility of websites through automation and still required human judgment and checking or manual check of the website. Automated programs can only evaluate a

few of the many possible accessibility issues that can arise in a particular Web site. Some tools include prompting for alternative text while other supports some HTML elements for increasing and ensuring the accessibility of the Web. W3C has divided these tools in to three sub categories i.e. *Evaluation Tools, Repair Tools and Filter and Transform Tools.*

The Evaluation tools are further divided into three sub-categories:

- *General, Tools that perform test for a variety of accessibility issue*
- *Focused, Tools that test for one or limited aspect of accessibility*
- *Service, Tools that run on an ongoing basis such as proxies, Web services and Monitors.* (W3C, 2005)

Tools can check the accessibility of the website according to the standard of Section 508 or checkpoints in WCAG 1.0 Priority 1, 2 and 3. It is important to understand that up to what standard the website is accessible. The developed standard by W3C for accessible Web sites is prioritized according to their impact on accessibility as;

Priority [1] or ‘A’ checkpoints are those that the developer of the Web must satisfy to insure that the page itself is accessible.

Priority [2] or ‘AA’ checkpoints are those that the Web developer should satisfy to

ensure that certain groups will be able to access information the web page.

Priority [3] or ‘AAA’ checkpoints are those the web developer may do to ensure that all content on the page is completely accessible.

Tools designed to evaluate web pages against WCAG1.0 Priority 1, 2 and 3 are displaying errors automatically but these tools generate a variety of reports based on results and analysis of the web page or web site.

Till now there are several different tools for testing, assessment and validation of Websites which are different from one another in several dimensions. Some of them do only testing while others perform fixing of a page as well. They are different from each other in terms of effectiveness, cost and reliability. The important thing is to evaluate the quality of these tools. For a common Web developer to develop and design a better and accessible Website, the key role of these tools is very critical. By evaluation and comparing the accessibility tools, Web developers and designers can act upon the appropriate selection and choice. This evaluation will also provide a competition between the tools manufacturers and will improve the tool's quality itself.

The automated tools identify different features of the Websites that might cause a failure of the Website in term of its accessibility to disable people. For example if an image element in a Website does not contain the ALT attribute then the Website will become an accessibility failure because the page can not be accessed through the speaking browser. There are over 30 automated tools. These includes Watch-Fire Bobby (2002), Usable-Net LIFT (2002), the W3C HTML Validator (World Wide Web Consortium 2001), Site, Page and Accessibility Valet Demonstrator (2000), Accessibility Wizard (2003) and Hi-Software ACC Verifier (2005) and A-Prompt (2004) etc. Some of these tools are commercial while some of them provide free online assessment of the Website. Unfortunately there is no standardization of these tools and even these tools provide different results of the single selected Websites according to their own interpretation. This might cause another problem for a Web developer where a Web developer can not decide to select which tool for developing Website according to the standard provided by the W3C WCAG 1.0.

The legislative frame work is clearly defined by World Wide Web Consortium (W3C) for developing an accessible Website to people with disabilities. The standards are achieved in the design area of

Websites (Jahankhani & Alexis, 2002a) but online banking services industry should develop a policy to pay more attention to make their Websites more accessible to people with disabilities. Although most of the banks are aware about the importance of e-Accessibility but a very little attention has been paid to incorporating accessibility guidelines in the Websites development of those banking Websites. The research found that only 22% Websites of the online banking services in USA and European Union achieved the minimum Level A conformance of the guidelines of WAI WCAG 1.0. The analysis revealed that the Websites of e-Banking services in United States of America are ranked very low in terms of accessibility standard standardized by WCAG 1.0 WAI and failed to conform the e-Accessibility approach because of the followings;

Priority 1, Sections;

- 1.1 Provide alternative text for all images.
- 1.1 Provide alternative text for all images map hot-spot (AREAs)
- 1.1 Provide alternative content for each OBJECT

Priority 2, Sections;

- 3.2 Use a public text identifier in a DOCTYPE statement

- 3.4 Use relative sizing and positioning, rather than absolute
- 3.5 Nest headings properly
- 9.3 Make sure event handlers do not require use of a mouse
- 12.4 Explicitly associate form controls and their labels with the LABEL element
- 13.1 Create link phrases that make sense when read out of context
- 13.1 Do not use the same link phrase more than once when the links point to different URLs
- 13.2 Include a document TITLE

Priority 3, Sections;

- 1.5 Client-side image map contains a link not presented elsewhere on the page
- 4.3 Identify the language of the text
- 5.5 Provide a summary for tables
- 10.4 Include default, place-holding characters in edit boxes and text areas
- 10.5 Separate adjacent links with more than white-space

5. Conclusion

The growth of the World Wide Web means that people with serious sight problems now have the opportunity to enjoy a wealth of information and services that was previously unavailable to them. The

research showed that majority of the online banks failed to appreciate the importance of e-Accessibility approach due to inaccessible services and lack of training need to achieve the highest level of e-Accessibility.

Good practice examples proves that there is no need to sacrificed website's visual appeal and the impression it is intended to convey to its users to the legal requirement. Instead all criteria can be met as part of a balanced relationship. In practice web design relies on many interwoven details, but the following essential principles strongly influence the design process;

- Accessibility is merely an aspect of usability. Maximize usability for the benefit of the entire audience and many accessibility issues are resolved in the process. Those that are not can then be specifically addressed.
- Embrace the design principles that are either expressed or implied in the WAI Guidelines and use them creatively.
- Do not, when seeking to make the web accessible, lose sight of the web site's fundamental objectives, or the needs of its entire audience. A degree of compromise is unavoidable, but accessibility is only a feature, not the purpose of the site.

The method that underpins a successful combination of aesthetic quality with accessibility basically relies on the

separation of design and content. Basically, one should make sure that how the page displays is not mixed up with what the page contains. The value of the information architecture should not be underestimated either. The end result is a website that not only will be accessible it would also be adaptable which in turn will;

- Work at all common screen resolutions,
- Be a cross-browser compatible
- Degrades into a usable form in old browser versions
- Be easily modified for different purposes.

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