Global e-government Web Accessibility: An Empirical Examination of EU, Asian and African Sites

Joanne M. Kuzma
Faculty of Computing, University of Worcester, UK
j.kuzma@worc.ac.uk
Dorothy Yen
Faculty of Business, University of Worcester, UK
d.yen@worc.ac.uk
Klaus Oestreicher
Faculty of Business, University of Worcester, UK
k.oestreicher@worc.ac.uk

Abstract

Accessibility of government Web sites is an important factor for inclusion of disabled persons to be able to fully utilize a variety of government services and information. In this paper, we examine the levels of disability accessibility for a variety of e-government sites in the European Union (EU), Asia and Africa. The study was conducted in 2008, and the results showed that the vast majority of sites in both developed and underdeveloped countries did not meet either legal requirements or industry guidelines in providing fully accessible government sites. Sites located in countries with stronger disabilities laws did score better in the compliance levels. Through comparison of the results, it is concluded that for governments to meet the needs of their disabled constituents, they need to implement a multiphase approach to site development, including stronger legal mandates and establishing localized best practice guidelines.

Keywords**:** *Accessibility, Disability, e-government, WCAG, W3C*

1. Introduction

The United Nations (UN) estimates that approximately 10% of the world's population are persons with disabilities (over 650 million people), of which 80% live in developing countries [1]. A sizable number of disabled users are using services available on the Internet, such as e-government sites. A study by the UK Office for Disability Studies in 2007 found that 27 percent of disabled users gave one of the reasons for accessing the Internet the ability to 'access government or official services' [2]. The capability to use government Web services is an important way to enhance the empowerment of disabled persons and to be fully included in society. There are two frameworks that are used to enhance the accessibility of Web services, including e-government sites: industry standards and legal mandates.

2. Framework for accessibility needs

Since the founding of the Internet, Web accessibility has been an important development factor for the World Wide Web Consortium (W3C), an international organization which ensures compatibility of standards among industry and government groups. In order to meet the needs of disabled Web users, the W3C has developed a series of accessibility standards to help disabled persons. When Web sites are developed under these guidelines, disabled persons are able to view and access the same information on the sites as non-disabled users. In 1999, a subgroup of the W3C, the Web Content Accessibility Guidelines Working Group (WCAG), developed the first accessibility standard, WCAG 1.0. This standard comprises a 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 [3]. There are three priority checkpoint levels in WCAG 1.0 that developers use to analyze the accessibility quality of their sites. Also, conformance level status is gained when different priority level checkpoints are met:

- Priority 1: A Web developer must satisfy these requirements, and this is the minimum requirement. "A" level status is met when all Priority 1 checkpoints are met in the sites.
- Priority 2: A Web developer should satisfy this checkpoint, but it is not mandatory. "AA" level status is met when both Priority 1 and 2 checkpoints are met.
- Priority 3: A Web developer may address this checkpoint. 'AAA' level status is met when Priority 1, 2 and 3 checkpoints are met. [4]

Building a fully accessible Web site need not be a daunting task if the site is properly designed with best practices in mind at the beginning of the design effort. Designers should strive to at least meet WCAG Priority 1 minimum requirements, although they should realize that if they do not also address Priority 2 and 3 checkpoints, they do not address features critical for accessibility across all disabilities [5].

Friedman & Bryen [5] 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. Also, the W3C makes a case for overall Web accessibility for all groups through legal policies [6]. In order to equalize Internet access for consumers with disabilities, some countries and entities have enacted accessibility laws. For example, the UN is trying to promote some level of protection to those with disabilities. In 2006, The UN

Assembly passed a Treaty on Rights of Disabled to attempt to protect the needs of 650 million disabled people in the world. Not only does this treaty address access to physical facilities, it also provides and impetus to improve access to information and communications infrastructures [7]. However, although 137 nations have signed the convention, only 27 have ratified the Protocol [8]. Another issue will be the actual execution of the legislation in the specific countries. Some countries have implemented their own disability laws with regards to Web access, although it is not globally consistent. A divide exists between some entities, such as the European Union (EU) countries with more stringent laws, versus countries in Asia and Africa, where disabled users have fewer protections. However, even though laws may exist, there is still a dearth of e-government sites in all countries that provide full access to people with disabilities. Many countries providing e-government services either fail to consider the needs of disabled people or their services do not reach those constituents [9].

In the UK, the Disability Discrimination Act (DDA) of 1995 requires providers of goods and services to provide equal access to all customers, including accessibility to information services such as Web sites and the use of communications [10]. However, even with the DDA law and the UK signing of the UN Treaty on Rights of Disabled in 2007 [8], most UK government sites do not meet minimum levels of accessibility. In 2005, a report produced by the e-Government Unit of the UK Cabinet Office found that found that "97% of official sites were unusable by disabled people, largely because they ignored well-known techniques for making data accessible" [11].

The three other EU countries in this study also have specific accessibility legislation. Germany and France signed the UN Treaty in 2007 and 2008, but have not yet ratified the Treaty [8]. In 2005, France extended its accessibility law to include electronic communications and Web sites. It also states that e-government Web sites conform to international standards by December 2009 [12]. In Germany, the barrier-free information technology (Barrierefreie Informationstechnik Verordnung – BITV) was enacted and applies to a variety of sectors, including the federal government [13]. Although Switzerland has not signed or ratified the UN Treaty [8], they have strong federal Web accessibility legislation. The Swiss Constitution that came into effect in 2000 prohibits disability discrimination and that the Confederation must be guided by W3C standards in setting rules for Internet accessibility. In addition, federal guidelines for designing accessible Web sites have been developed that apply to central Federal administration sites [14]. While individual members of the EU often have their own accessibility or discrimination laws, there is no current encompassing EU legislation that relates solely to Web accessibility. However, countries in the EU are required to adhere to the eEurope Action Plan which requires institutions to adopt WCAG guidelines and best practices to ensure ensuring that people with disabilities benefit fully from new technologies and the Internet [15].

While many EU governments have specific Web accessibility laws, developing countries in Asia and Africa have less stringent laws, if any. India signed and ratified the UN Treaty in 2007 [8]. However, there are no specific Web accessibility laws; although an e-Governance Standards Working Group has been meeting since 2007 to formulate a Web accessibility policy for the country [16]. This lack of regulation has been supported in research of e-government Web accessibility. A 2008 study of 23 government agencies found that only 2 agency home pages even met WCAG priority 1 minimum standards for accessibility [17]. China currently has no law which specifically addresses Web accessibility, although the government is in the process of reviewing the 1991 Law of Protection of Disabled Persons to consider accessibility issues [18]. China has signed the UN Treaty in 2007, but has not yet ratified it [8]. A study by Shi of 339 Chinese e-government sites found that all sites have significant accessibility problems and no single home page of Chinese e-government Web sites was found to pass the W3C Priority 1 accessibility level [19].

Cambodia has signed the UN Treaty but not yet ratified it [8]. Legal protection for people with disabilities is poor and is often left to the civilian sector, with no current Web accessibility legislation. In 2008, the Council of Ministers approved a draft of a law to promote protection of disabled persons, and that draft has been submitted to parliament [20]. The Philippines has one of the strongest outlooks among Asian countries of promoting disability access. First, the government both signed and ratified the UN Treaty [8]. Second, the federal law section (RA7277) "the Magna Carta for the Disabled Persons," specifically prohibits discrimination against disabled persons and can be interpreted to also include technologies such as the Web. A Philippine Web Accessibility Group (PWAG) also is working on implementing Web design accessibility recommendations [21].

In Africa, Liberia signed the UN Treaty while South Africa, Kenya and Namibia have both signed and ratified it [8]. South Africa has several pieces of legislation related to general disability issues, such as employment and skills development, but nothing specific related to Web accessibility under current law [22]. Current Namibian law does not address Web accessibility and although a portion of the general law does address employment discrimination, it is ineffective [23]. Liberia's current "National Commission on Disabilities, 2005" broadly covers employment discrimination and does not address technology [24]. Kenya has a general disability law - The Persons with Disabilities Act of 2003, but it does not specifically address Web access [25] A 2006 UN report of global Web accessibility of 20 countries, including central government sites in Kenya, found that none of the tested Kenyan Web sites met WCAG priority 1 standards [26].

3. Methodology

The first phase of the project was to choose an appropriate software tool to analyze the site based on WCAG accessibility guidelines. The Centro Tecnologico de la Informacion y la Communication (CTIC) in Spain, a non-profit group emphasizing Web research and accessibility, has developed a software product, TAW, to analyze accessibility problems with Web sites. This product is based on WCAG 1.0 guidelines and can test checkpoint levels A (priority 1, basic accessibility), AA (priority 2, intermediate accessibility) and AAA (priority 3, high accessibility) [27]. For each of these checkpoints TAW provides a detailed report of both automatic and human review issues. Automatic issues are those errors that the software has checked based on the WCAG guidelines. Issues that are tagged as requiring human review are warnings that are not always accurately measured by an automated tool and should be manually checked by the Web designer. When errors or warnings are tagged, the researcher can click on the specific error tag and a detailed explanation based on the WCAG guidelines will be explained [28]. The researcher can also choose to analyze the home page of the site or review several layers deep within the site.

One limitation of the software is that it can only analyze WCAG 1.0 guides, and cannot review other standards such as WCAG 2.0 or American Section 508. However, for the research of this study, the 1.0 standard was sufficient. If this study were to be expanded, another software tool would need to be used. TAW has been used in other research of Web accessibility issues, such as a 2006 study of 230 digital repositories in 16 European countries, whose results showed poor levels of accessibility and bad design practices [29].

The research for this study was accomplished through analyzing the e-government sites of 12 counties to determine their adherence to WCAG guidelines. Four countries were each chosen from the EU, Asia and Africa:

- EU (UK, France, Germany, Switzerland)
- Asia (China, India, Cambodia, Philippines)
- Africa (South Africa, Liberia, Namibia, Kenya)

For each of these countries, 6 different federal government agency sites were picked for analysis. For the basis of some level of consistency, an attempt was made to choose similar government ministries or departments. For example, the six UK e-government sites picked were:

- House of Parliament
- Prime Minister
- Ministry of Defence
- Ministry of Justice
- Department for Business, Enterprise and Regulatory Reform
- Foreign and Commonwealth Office

For the other countries, most had Web sites had parliament, justice or defense entities, although they made have been called by a different name. However, this could not be accomplished in all cases, such as the instance where China did not have a parliament entity of government, so another government agency was substituted. Another criterion was that the sites chosen were English-based, or the sites had an English translation that was tested. All sites were federal-based government entities for each of the countries. The TAW software does allow the choice of testing either the home page or all pages and levels of a Web site. For a consistent method of testing, only the home page of each of these e-government sites was tested for accessibility issues.

4. Results

Table 1 shows the accessibility testing results run on four EU countries in December 2008: a) UK, b) France, c) Germany and d) Switzerland. The second column indicates whether each country has either signed or ratified the UN Treaty on Rights of Disabled. Three of the EU countries have done so, except for Switzerland. However, as the third column shows, all of the EU counties, including Switzerland have strong internal federal disability laws, as previously discussed in the Framework section of this research.

Column four indicates how many of the six e-government sites tested for each country contained the minimum level of issues to pass the WCAG priority 1 (A level) requirement, which is the minimum required level of Web accessibility for users with disabilities, and passed all Priority 1 checkpoints. Both Switzerland and Germany had all six of its e-government sites which passed WCAG 1.0 priority 1 checkpoints, and were thus considered to meet the minimum requirements for WCAG accessibility standards. France had four of the six sites passing the test, while Switzerland had only one.

Table 1: Accessibility results for EU countries

Country	UN Treaty	Internal Law	Min level	A error	A warn	AA error	AA warn	AAA error	AAA warn
UK	Yes	Strong	6	0	294	98	445	25	134
France	Yes	Strong	4	33	724	323	569	64	211
Germany	Yes	Strong	6	0	518	88	482	6	118
Switzerland	No	Strong	1	7	332	69	311	8	92
Total				40	1868	578	1807	103	555

Columns five through ten exhibit the number of errors (automated computerized results) and warnings (issues requiring additional human intervention and review). Columns five and six display the number of errors and warnings for WCAG priority 1 (A level), while columns seven and eight display the issues for priority 2 (AA level) and columns nine and ten contain issues for priority 3 (AAA level). Both Germany and the UK did well with no errors for priority 1 checkpoints, although they did have 294 and 518 warnings that would require human intervention to manually check for WCAG compliance. France had 33 errors while Germany had seven, and both countries had numerous warnings. For WCAG priority AA and AAA levels, none of the EU e-government sites met the minimum requirement for passing these checkpoint levels. Switzerland (69 errors) and Germany (88)

errors did best with the lowest number of AA issues. For AAA errors, Germany (6) and Switzerland (8) again scored the best results.

Table 2 illustrates the accessibility results and legal protection for Asian counties: a) China, b) India, c) Cambodia and d) Philippines. All of the countries have signed and/or ratified the UN Treaty on Rights of Disabled. However, compared to the EU countries, in Asia the only country with a strong internal disability law is the Philippines. The Philippines was the Asian country showing the strongest compliance level for WCAG level A, with four of the six government sites meeting the checkpoint requirements, and only showing eight overall 'A' level errors and 426 warnings. Cambodia had one government site meeting minimum requirements, and had 67 total 'A' level errors and 663 warnings. China and India did not have any sites meeting 'A' level minimum checkpoint accessibility requirements. For WCAG priority AA and AAA levels, none of the countries met minimum checkpoint levels. Cambodia (517 'AA' and 87 'AAA' errors) and India (825 'AA' errors and 112 'AAA' errors) had the least number of errors in both categories while China and the Philippines had the most.

Table 2: Accessibility results for Asian countries

Country	UN Treaty	Internal Law	Min level	A error	A warn	AA error	AA warn	AAA error	AAA warn
China	Yes	Weak	0	332	1156	2273	1198	388	664
India	Yes	Weak	0	145	442	825	606	112	182
Cambodia	Yes	Weak	1	67	663	517	631	87	222
Philippines	Yes	Strong	4	8	426	862	719	123	277
Total				552	2687	4477	3954	710	1345

Table 3 exhibits the results for African countries: a) South Africa, b) Liberia, c) Kenya and d) Namibia. All four countries have either signed or ratified the UN Treaty, but all four have weak disability policies and none have specific Web accessibility laws. Only two countries, Liberia and Kenya, had specific government sites that met the WCAG minimum accessibility requirements, with one government site for each. All countries showed a large number of errors for each of the three priority levels. Namibia (66 errors) and Kenya (77 errors) had the fewest errors for 'A' level. Liberia (110 'AA' and 284 'AAA') and Namibia (219 'AA' and 17 'AAA') had the fewest errors in categories 'AA' and 'AAA'.

Table 3: Accessibility results for African countries

Country	UN Treaty	Internal Law	Min level	A error	A warn	AA error	AA warn	AAA error	AAA warn
South Africa	Yes	Weak	0	203	948	1299	1084	168	376
Liberia	Yes	Weak	1	138	346	110	584	14	115
Kenya	Yes	Weak	1	77	623	812	919	175	329
Namibia	Yes	Weak	0	66	319	219	284	17	70
Total				484	2236	2440	2871	374	890

5. Implications

Evaluation results show that the vast majority of worldwide government Web sites do not meet WCAG 1.0 checkpoint standards. Some countries, such as the UK, have their own federal disability laws which mandate sites meet minimum accessibility requirements. However, even those countries with internal laws, like the UK, have not totally met minimum requirements. The results show that those countries with stronger internal disabilities laws surpass those with weak or non-existent laws in their compliance levels. For example, all the tested EU countries have strong internal disabilities laws, and the results of this study showed that all EU countries outperformed those from Asia and Africa in compliance at all three WCAG priority levels. Results of the total number of A-level issues for the EU (Table 1) showed 40 total errors and 1868 warnings. This was much lower than the levels for Asia (Table 2) showing 552 errors and 2687 warnings. African results (Table 3) for A-level indicated 484 errors and 2236 warnings. These findings were duplicated for AA and AAA levels, demonstrating much higher error and warnings in Africa and Asia than in the EU, where disability laws are more stringent.

Although most Asian countries showed poor compliance results and weak laws, the Philippines was an exception in this study. With their "Magna Carta for the Disabled Persons" legislation and a strong Philippine Web Accessibility Group, this has

correlated with much higher compliance of Web accessibility design among their government sites, with most meeting the minimum WCAG checkpoint requirements.

Most of the countries in this study have either signed or ratified the UN Treaty on Rights of Disabled, which would guarantee persons with disabilities equal access to technology and communications. However, there is a low correlation between signing or ratifying this Treaty versus actual practice of adequate Web design. Several factors may be associated with this. First, some countries have only signed the law and only 44 have ratified the Convention [8]. Those countries that have not yet ratified it are not bound by the disability law. Second, this is a very new Treaty and most countries signed in 2007 or 2008 [8]. Thus, there has been a very short time between when a country ratified the Treaty versus attempting to meet full implementation of the law. Also, the mere existence of laws or even voluntary policies s is no guarantee of enforcement. Some measure of enforcement should be in effect to ensure that the laws are not toothless. In a study of American e-government sites, the authors findings suggested that increased Web accessibility can be improved by improved enforcement of federal and state policies [30].

In order to meet the needs of their disabled constituents, governments have a variety of options they could implement. Shi [31] lists three factors that governments could institute when attempting to improve the access for disabled Web consumers. First, he suggests that regular and periodic reviews be included in government policies or action plans. Second, the government needs to lay the legal foundation for setting accessibility standards. This suggestion correlates to the results shown in this study, where governments with stronger laws that protect the rights of disabled persons have better results in Web accessibility. Third, Shi recommends that government includes accessibility as a key performance measure. An example would be if government Web sites were tested by outside agencies using specific performance accessibility criteria.

There are other initiatives governments may take to ensure adequate Web accessibility. A consistent approach should be applied across all levels of government for Web design and accessibility. The current research shows a large diversity in Web accessibility errors and warnings across different government entity sites for each country, along with different Web design. A consistent approach and government design standards would help provide a consistent level of accessibility. For example, The UK Cabinet Office recommends that government Web sites meet the requirements for WCAG 1.0, priority 1, but the Office has also published an additional blueprint of best practices for building adequate sites [32]. Thus, all government entities for a country would have a consistent approach to building a truly accessible Web site.

Providing technical assistance to implementers was found to be a positive correlation in Web accessibility in a study of American government sites [30]. The Philippines Web Accessibility group is an example of how a group providing accessibility assistance can have a positive impact on effective Web design for those with disabilities [21]. Besides being provided with technical assistance, implementers also should be trained in specific WCAG standards and local legal requirements for accessibility. Although federal legislators make the laws and industry work groups can provide technical guidance, it is the administrative staff that actually implement and maintain the sites, thus it is imperative they understand both design elements and legal requirements. Designers should periodically review their sites and plan for updates to the laws or industry standards. Jaeger [33] recommends it is beneficial to create fully accessible sites during the design phase, rather than trying to retrofit them after development.

6. Conclusion

This research shows that the majority of worldwide government sites are not meeting the needs of their disabled constituents in providing adequate levels of accessibility, and few government Web sites come close to passing disability testing guidelines or legal mandates. The findings show that those countries with stronger disability laws and adherence to WCAG or local accessibility standards have more accessible e-government sites. The significance of a strong legal policy supports the possibility that sites will be more accessible to persons with disabilities and preventing a digital divide. However, although it was found that stronger policy correlates to better accessibility, it should not be assumed that policies alone guarantee absolute adherence. Even some countries with specific laws relating to Web accessibility are not in 100 percent compliance. Achieving a high level of Web accessibility is the responsibility of both the individual governments as well as Web administrators. A combination of legal and technical methods should be combined to achieve a higher level of compliance. To facilitate this, government need to not only implement laws, but must find ways to ensure compliance with their mandates and impose sanctions if they are not met. Web administrators also play a critical role in ensuring their sites adhere to government laws and industry standards. As the worldwide usage of e-government sites expands, both groups should work to ensure that their disabled persons have equal access to Web sites, thus benefiting a much larger group of constituents.

References

[1] UN, (2007) "Convention on the Rights of Persons with Disabilities and its Optional Protocol" [online] http://www.un.org/disabilities/documents/ppt/crpdbasics.ppt.

[2] Williams, B., Copestake, P., Eversley, J., & Stafford, B. (2007) "Experience and Expectations of Disabled People: A Research Report for the Office of Disability Issues", Office for Disability. [online] http://www.officefordisability.gov.uk/research/pdfs/eedp-full-report.pdf.

[3] W3C, (2008) "Overview of WCAG 2.0 Documents", [online] Web Accessibility Initiative, April http://www.w3.org/WAI/intro/wcag20.php/.

[4] W3C, (1999) "Web Content Accessibility Guidelines", [online] *Recommendation, W3C*. May http://www.w3.org/TR/WCAG10/.

[5] Friedman, M. and Bryen, D., (2007) "Web Accessibility Design Recommendations for People with Cognitive Disabilities", *Technology & Disability*, Vol 19, No. 4, pp 205-212.

[6] Henry, S. (2005) "Developing a Web accessibility business case for your organization", [online] *W3C*. http://www.w3.org/WAI/bcase/.

[7] Arbour, L. (2007) "Record number of countries sign UN treaty on disabilities on opening day", [online] UN News Centre. http://www.un.org/apps/news/story.asp?NewsID=22085&Cr=disab&Cr1

[8] UN, (2008) "Convention & Optional Protocol Signatories & Ratification", [online] http://www.un.org/disabilities/countries.asp?navid=17&pid=166.

[9] Foley, P., Alfonso, X., Fisher, J., Bradbrook, G. (2005) "eGovernment: Reaching socially excluded groups?", Report prepared by IECRC and Citizens Online for the IDeA. [online] http://www.idea.gov.uk/idk/core/page.do?pageId=1074872.

[10] Blue, L. (2001) “Web site design and the Disability Discrimination Act 1995”, [online] *Computers and the Law*, December 2000/January 2001. Vol 12, No. 5, pp 16-20.
[11] BBC News, (2005) “Government Sites ‘fail disabled”, [online] November, 29, http://news.bbc.co.uk/1/hi/technology/4478702.stm.
[12] Winckler, M., Xiong, J., & Noirhomme-Fraiture, M. (2007) “Accessibility Legislation and Codes of Practice: an Accessibility Study of Web Sites of French and Belgium Local Administrations”, In proceedings of the 1st International Workshop on Design & Evaluation of e-Government Applications and Services (DEGAS'07), held in conjunction with IFIP TC13 INTERACT'2007. Rio de Janeiro, Brazil, September 11th, 2007. [online] http://ftp.informatik.rwth-aachen.de/Publications/CEUR-WS/Vol-285/paper06.pdf.
[13] Buhler, C. and Wallbruch, R. (2005) “E-accessibility in Germany: acts and ordinances, outcome of benchmarking and activities”, [online] Policies and Legislations in favour of e-accessibility in Europe Conference, Paris, France. http://braillenet.org/colloques/policies/documents/WallBruch.rtf.
[14] Swiss Confederation. (2005) “From Equality Law to Internet Accessibility: Implementation of the Federal Act on the Elimination of Discrimination against People with Disabilities (EPDA)”, [online] *Federal Department of Home Affairs DHA, Bureau for Equality of People with Disabilities FBED*, http://www.access-for-all.ch/de/behig/EqualityLaw_I-Access_en.pdf.
[15] European Commission. (2002). “Web Content Accessibility Guidelines for Public Sites”, [online] http://ec.europa.eu/information_society/policy/accessibility/z-techserv-web/com_wa2001/index_en.htm.
[16] National Informatics Centre, (2008) “Web Accessibility Standards”, [online] Department of Information Technology, Ministry of Communications and Information Technology, http://egovstandards.gov.in/web_accessibility/web_acc_tor.
[17] Subramani, L. (2008) “Government websites: Access denied to special users”, Deccan Herald. [online] December 8, http://www.deccanherald.com/Content/Dec82008/state20081208105396.asp.
[18] People’s Daily Online, (2004) “China revises law protecting disabled”. [online] http://english.people.com.cn/200412/03/print20041203_166084.html
[19] Shi, Y. (2006a) “The accessibility of Chinese local government Web sites: An exploratory study”, *Government Information Quarterly*, April 2007. Vol24, No. 2, pp 377-403.
[20] Action on Disability & Development, (I2008) “Draft Disability Law sent for approval”, [online] http://www.add.org.uk/newsStory.asp?ID=10081.
[21] Esposa, J. (2008) “Philippines Law Support Web Accessibility, an Overview”, [online] Manila Christian Computer Institute for the Deaf (MCCID) & Philippine Web Accessibility Group (PWAG). http://dump.formfunctionclass.com/mini/2008-10-30/Philippine%20Laws%20Supporting%20Web%20Accessibility%20-%20Jojo%20Esposa.ppt.
[22] Dube, A. (2005) “The role and effectiveness of disability regulation in South Africa”, Disability Knowledge and Research programme. [online] http://www.disabilitykar.net/docs/legislation_sa_ex.doc.
[23] US Department of State, (2007). “Namibia - Country Reports on Human Rights Practices”, [online] Bureau of Democracy, Human Rights, and Labor. http://www.state.gov/g/drl/rls/hrrpt/2006/78749.htm.
[24] Handicap International. (n.d.) “Position Statement: Disability and PRS in Liberia”, [online] www.handicap-international.fr/bibliographie-handicap/4PolitiqueHandicap/hand_pauvrete/prsp/Position_paper_liberia.doc.
[25] Kenya, (n.d.) **“**The Persons with Disabilities Act, 2003”, [online] http://www.kenya.disabilityafrica.org/folders.php?reveal=569&screen=1280**.**
[26] UN, (2006) “United Nations Global Audit of Web Accessibility”, November, 2006. [online] http://www.un.org/esa/socdev/enable/documents/fnomensarep.pdf.
[27] Fundacion CTIC. (2009) “Web Accessibility”, [online] http://www.fundacionctic.org/web/contenidos/en/tecnologia/accesibilidad.html.
[28] TAW, (n.d.) “TAW Standalone User’s Guide”, [online] http://www.tawdis.net/taw3/manual/en/.
[29] Rovira, C., Marcos, M., Codina, L. (2007) “Repositorios de publicaciones digitales de libre acceso en Europa: análisis y valoración de la accesibilidad, posicionamiento web y calidad del código”, *El profesional de la información,* Jan/Feb 2007, Vol16, No. 1, pp. 24-38.
[30] Rubaii-Barrettt, N. and Wise, L. (2008) “Disability Access and E-Government: An Empirical Analysis of State Practices”, Journal of Disability Policy Studies, June 2008, Vol 19, No. 1, pp. 52-64.
[31] Shi, Y. (2006b) “E-Government Web Site Accessibility in Australia and China: A Longitudinal Study”, Social Science Computer Review, Vol24, No. 3, pp. 378-385.
[32] Cabinet Office. (2003) “Quality Framework for UK Government Website Design: Usability issues for government websites”, [online] http://archive.cabinetoffice.gov.uk/e- government/docs/qualityframework/pdf/quality.pdf.
[33] Jaeger, P. (2008) “User-Centered Policy Evaluations of Section 508 of the Rehabilitation Act”, *Journal of Disability Policy Studies*. June, Vol 19(1). pp. 24-33.