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TO WHOM IT MAY CONCERN

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Inclusive e-Government: Steps towards the e-inclusion of disabled persons in the WWW age

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Abstract

The Internet has become an omnipresent and integral part of the information society, with an ever increasing role in the delivery of learning, professional industry, recreation and a myriad of other aspects of life. Internet enabled services provided by governments have been identified as possible tools that could help to bridge the socio-economic divide. Sir Berners-Lee's original vision for the Internet was "humanity connected by technology". A recent issue of concern worldwide is the growing digital divide for people with disabilities. Thus the e-inclusion of disabled persons should be an integral component of information society strategies. Consequently, legislation and policies have been enacted to guide the roll-out of universally accessible e-government services. However, legislation and policies are not enough without the necessary implementation. This paper assesses South African government legislation and policies aimed at the e-inclusion of persons with disabilities. Using the Web Content Accessibility Guidelines 1.0 published by the World Wide Web Consortium (W3C), we use the South African Revenue Services as a test-bed to assess the accessibility of South African e-government websites. Furthermore, the paper assesses the requisite technologies needed by disabled persons to effectively participate in the WWW era society. In conclusion we advocate for the inclusion of "technical illiteracy" as a disability, and the redefinition of disability in the context of WWW use.

Keywords: E-government, universal access, disabled persons, legislation, policy, technical illiteracy, South Africa.

1. Introduction

The United Nations (2006) estimates that there are over 500 million persons with either mental, physical or sensory disabilities. Capecchi (2004:54) opines that the number of

people with disabilities is increasing, but for different reasons. In the developed world people with disabilities can survive life threatening injuries (and subsequent disabilities) and live a longer life. Wars and other forms of violence chiefly contribute to disabilities in the developing world. According to the census figures for 2001, disabled persons constitute 5% of the South African population (Stats SA, 2005). Persons aged 80+ constitute the biggest demographic of the disabled, as indicated table 1.1.

Table 1: Number of disabled persons by age and gender (Stats SA, 2005)

Age group (years)	N			%		
	Male	Female	Total	Male	Female	Total
0-9	101 838	88 822	190 660	2,2	1,9	2,1
10-19	156 980	148 755	305 735	3,2	2,9	3,0
20-29	149 422	134 806	284 228	3,7	3,2	3,5
30-39	165 153	145 787	310 940	5,4	4,3	4,9
40-49	165 871	168 727	334 598	7,5	6,7	7,1
50-59	142 602	155 928	298 530	10,8	10,3	10,5
60-69	102 815	138 168	240 983	13,7	12,5	13,0
70-79	62 396	111 578	173 974	16,9	17,7	17,4
80+	34 966	81 368	116 334	25,6	27,9	27,2
South Africa	1 082 043	1 173 939	2 255 982	5,05	5,0	5,0

Persons with disabilities face a number of challenges and are disadvantaged in terms of status and social power (Jaeger, 2006:113). As disabled persons are subjected to prejudice and deprived of essential services, the economic and social development of communities where disabled persons domicile fail to harness the potential of this population demographic (Stats South Africa, 2005:6). Wallis (2005:481) indicates that in the knowledge economy, the social inclusion of the disabled is particularly important for online mediated service providers. Table 1 indicates the population demographic with the highest number of disabilities is aged between 20 – 50 years. This demographic is integral to economic and national development as it is the most economically active age range (United Nations, No Date). Governments and international bodies such as the United Nations have thus taken steps to prevent and eradicate discrimination against the disabled members of society, thereby harnessing their potential. Equal access to WWW technologies is of utmost importance in this era, where business, education and government are increasingly going online.

2. Literature review

2.1 e-Government and social inclusion

Abanumy, Al-Badi & Mayhew (2005:100) declare that the two main necessities for successful e-government are availability and accessibility. e-Government presents citizens with new communication channels, reducing inequalities as well as enhancing social inclusion (Cairns, Wright & Bradfield 2004:227, 228). Citizens can access services around the clock, get an opportunity to participate in online forums and benefit

from efficient service delivery (Jaeger, 2003:324). Jaeger (2003:326) highlights the importance of accessibility for the disabled by acknowledging that lack of access to e-government is an impediment to successful e-government. The e-inclusion of persons with disabilities is dependent on the provision of e-government websites that do not singularly depend on mental, physical or any other sensory abilities. A disabled persons “friendly” website may possess assistive technologies and haptic devices such as screen readers, screen magnifiers, speech synthesisers, alternative keyboards, pointing devices and voice input software (Abanumy *et al.* 2005:101; Bertot & Jaeger, 2006:165).

Democratic values dictate that e-government websites have to be accessible to all citizens regardless of acumen, ability or knowledge (Baker, 2009:83). As South Africa moves from the legacy of apartheid into a future guided by inclusive democratic practices, universally accessible services are a necessity in the new political landscape. Damodaran (2005:10) terms citizens’ consumption e-government mediated services as e-democracy. The author identifies the two dimensions of e-democracy, e-voting and e-participation, as essential to the promotion of social inclusion. For e-inclusion to be possible, the needs and goals of the digitally marginalised, such as the disabled and the old (Damodaran, 2005:10) must be articulated and policies and legislation implemented to actualise the beneficiation process.

2.2 What is a disabled person?

In defining disability, there has been lobbying for a social approach to conceptualising disability as opposed to regarding it (disability) as a medical issue (South Africa, 1997). Duff & Ferguson (2007:143) posit that the medical approach views a disabled person as having something wrong with them, a personal tragedy. Conversely, the social approach focuses on the social barriers that affect disabled persons, which are a result of society’s failure to be accommodative of the needs of disabled persons.

According to the Social Assistance Act (South Africa, 2004:11), a disabled person is an individual who is, “*owing to a physical or mental disability, unfit to obtain by virtue of any service, employment or profession, the means needed to enable him or her to provide for his or her maintenance.*” Although the Act does not explicitly or exhaustively list forms of disabilities, females and males who have attained the age of 60 and 65 respectively (*viz*, age is a variable) have been categorised as disabled persons. However, we regard age as a variable that has a causal relationship with other disabilities, *viz*, the more aged a citizen is, the more the likelihood of a certain form of disability. Hence we purposefully disregarded age as a disability, but rather focused on the likely disabilities that are a consequence of age.

3. Aims and research methods

This purpose of this paper is as follows: firstly, we identify and discuss the South African

policies and legislation which promote the social inclusion of the disabled, particularly in the WWW economy. International policies and guidelines adopted are discussed. The South African Revenue website, due to its stature as the most advanced South African e-government website (Farelo & Morris, 2006:8) was evaluated for accessibility problems. The Web Accessibility Toolbar (WAT), which is guided by the World Wide Web Consortium (W3C) and the United States' Section 508 of the Rehabilitation Act (Disabled World, 2009) was utilised for this purpose. Section 508 compels all US government agencies and foreign agencies that receive federal funds to make their website accessible for people with disabilities. Lastly, through a literature review, we sought to identify the requisite technologies needed for the successful e-inclusion of the disabled citizens.

4. Findings

4.1 Legislation and policies on the disabled: South Africa

South Africa is a signatory to *The United Nations Convention on the Rights of Persons with Disabilities*, which it signed in March 2007 and ratified in December 2007 (United Nations, 2010). The convention is intended as an explicit instrument to advance the human rights and social development of disabled persons, making special adaptations in all categories of rights if necessary. There are eight guiding principles that underlie the convention and they are listed as;

- i. Respect for inherent dignity, individual autonomy including the freedom to make one's choices, and independence of persons.
- ii. Non-discrimination.
- iii. Full and effective participation and inclusion in society.
- iv. Respect for difference and acceptance of persons with disabilities as part of human diversity and humanity.
- v. Equality of opportunity.
- vi. Accessibility.
- vii. Equality between men and women.
- viii. Respect for evolving capacities of children with disabilities and respect for the right of children with disabilities to preserve their identities.

(United Nations, 2010)

The South African government has enacted various pieces of legislation as well as policies to promote an inclusive society. These include the Employment Equity Act, Skills Development Act, the Sexual Offences Amendment Bill, Labour Relations Act, Electronic Communications and Transactions Act and the Electronic Communications Act. The Integrated National Disability Strategy white paper of 1997 sought to stimulate a process of creating an inclusive society, with equal opportunities afforded to the disabled (Mbeki, 2008). The former president, President Thabo Mbeki, stated that the legislative framework is crucial in endeavours to promote the rights and responsibilities of the disabled.

The Electronic Communications and Transactions Act and the Electronic Communications Act directly influence the potential of e-government around the country. The Electronic Communications and Transactions Act seeks to ensure that electronic transactions (viz., e-government) “*promote universal access primarily in underserved areas*” and ensure that “*the special needs of particular needs of particular communities and, areas and the disabled are duly taken into account*”, (South Africa, 2002:16). The Electronic Communications Act aims to regulate the provision of WWW enabled services, taking into consideration the needs of the previously disadvantaged and disabled (South Africa, 2006). Fittingly, Capecchi (2004:58) asserts that broad social welfare strategies guide the implementation of technology for the benefit of the disabled. However, legislation and policies only attain relevance upon implementation; otherwise they remain no more than statements of intent imparting little or no benefits for the intended persons. As noted by Grady & Ohlin (2009:165), “*developing policies and procedures, however, and then leaving them stored away is a mistake.*” How effective policies and legislation have been in promoting the rights of the disabled remains a matter of debate. For example, Duff & Ferguson (2007:154) noted that despite legislative efforts that promote the rights of disabled people in the United Kingdom, there was minimal inclusion of people with disabilities in some industries. Similarly, Meinhardt (2005) states that the enforcement of regulations to ensure accessibility is often ignored in South Africa. Shi (2007:396) suggests that enacting regulations that reward compliance or sanction failure to comply may improve the implementation of WWW inclusion laws.

4.2 National accessibility portal

Due to the implementation of accessibility policies and regulations, the National Accessibility Portal were put into practice. The National Accessibility Portal is a joint project between the Office on the Status of Disabled Persons (OSDP) in the Presidency, Disabled Persons’ organisations and the Council for Scientific and Industrial Research. NAP’s aim is to curtail the marginalisation of people with disabilities from the mainstream economic and social activities (NAP, 2009). This is achieved through research and development in Text-to-Sign-Language, Text-to-Speech screen readers and various support services necessary to empower the disabled citizens. The NAP project suggests that the South African government has improved in implementing and enforcing legislation to promote e-government inclusiveness since Meinhardt’s (2005) declaration that enforcement of accessibility regulations was deficient in South Africa. Content is available in various languages, and the portal seeks to make content available in all the official South African languages. Furthermore, there has been lobbying for the South African Sign Language to be taught as a high school subject (Rademeyer, 2009).

4.3 SARS accessibility

This segment presents the accessibility scores of the SARS website. The “error type” column indicates the accessibility problems as generated by the Web Accessibility Toolbar. The errors in column one are contrasted against the Web Content Accessibility

Guidelines (WCAG) they are violating (W3C, 1999).

Table 2: Accessibility errors on the SARS website

ERROR TYPE	DESCRIPTION	INSTANCES	WCAG CHECKPOINT 1.0 #
"Missing alternative text"	Alternative text is not present for an image	6	1.1 provide a text equivalent for every non-text element...
"Background images should not contain important content"	A background image is present	1	14.1 Use the clearest and simplest language appropriate for a site's content.
"Javascript element"	One or more javascripts elements are present	6	6.3 Ensure that pages are usable when scripts, applets...are not supported (e.g. do not use javascript).
"Layout table"	A table is present that does not have any header (<th>) cells.	16	13.3 Provide information about the general layout of the site.
"Event handler"	An event handler is present.	19	6.4 For scripts and applets, ensure that event handlers are input device-independent.
"Invisible content"	Content is hidden using CSS display: none or hidden: visibility	1	3.3 Use style sheets to control layout and presentation.
"Spacer image missing alternative text"	Alternative text is not present for an image used as a layout spacer.	7	1.1 Provide a text equivalent for every non-text element...
"Marquee"	A <marquee> element is present.	1	7.Marquee elements...should not be used
"Popup window"	A link is set to open a new window.	4	10.1 do not cause pop-ups to appear or other window to appear.
"Same-page link"	A link is set to jump to another location in the same document.	3	13.1 Clearly identify the target of each link.
"Problematic link text"	Link does not make sense out of context, contains extraneous text (such as "click here"), or is the same as another link on the page, but links to different location.	1	13.1 link text should be meaningful enough when read out of context...either on its own or as part of a sequence of links.
"Linked image missing alternative text"	Alternative text is not provided for an image that is the sole contents		1.1 Provide a text equivalent for every non-text element.

	of a link.	5	
“Form label missing”	A form <input>, <select>, or <textarea> does not have a corresponding label.	1	10.2 Ensure that the label is properly positioned.
“Empty heading”	A heading contains no content.	5	14.3 Create a style of presentation that is consistent across pages.
“Empty list”	A does not contain any list items	1	3.6 Mark up lists and list items properly.
“Incorrectly ordered headings”	Headings are not in a logical order (e.g., first heading is not h1 or headings are skipped).	1	3.5 Use header elements to convey document structure and use them according to specification.
“Unordered list”	An unordered (bulleted) list is present (the element).	3	3.6 Mark up lists and list items properly.

“Event handler” and “layout table” errors were the most prominent in the SARS website. Event handlers should not be device dependent (citizens must be allowed to use technologies of their choice) as that might inconvenience some disabled citizens, whilst layout problems might be challenging for those with cognitive disabilities. The Web Content Guidelines Working Group (WCWG) states the checkpoints listed in table 2, although important, it does not expect them to be necessary in perpetuity as web assistive technologies continue to evolve (W3C, 1999).

4.4 Technologies needed for e-inclusive e-government

Policies and legislation primary indicate intent to act by the government. The question that arises is; which technologies could be incorporated into e-government websites to render them accessible to the disabled? To address this question, most governments have used the World Wide Web Consortium (W3C) for guidance (Kuzma, 2010:143). Hence table 3, although derived from a variety of sources, presents the above stated technologies.

Table 3: Disabilities and website assistive features

DISABILITY VARIABLE	ASSISTIVE WEBSITE FEATURES	SOURCE
Colour blindness	Style sheets control	W3C (2005)
Deaf-blindness	Accessible multimedia, style sheets, labelled frames.	W3C (2005)
Repetitive stress injury	Keyboards equivalents of mouse-driven commands, access-key.	W3C (2005)

Deafness	Captioned audio portions of multimedia files.	Stats SA W3C (2005)
Cognitive disability	Consistent navigation options, consistent design, multiple service options, clear and simple language	W3C (2005)
Dyslexia		W3C (2005)
Blindness	Alternative text, screen readers, appropriate mark-up of tables, synchronisation of visual, speech and Braille display.	AFB (2009) Stats SA W3C (2005)
Physical injuries	N/A	Stats SA South Africa (1997)

The physical layout and design of e-government access centres such as telecentres should cater for the needs of physically disabled citizens. In our previous study (Kaisara & Pather, 2009) the proximity of access centres to the citizens' residences was highlighted as an important factor in the adoption of e-government services. The proximity of e-government access centres is of essence for the disabled as travelling long distances might be more strenuous than for an able bodied citizen. This dimension is perhaps more important in developing than developed countries, as proportionally more citizens access WWW resources through telecentres and other public service points (Ernberg, 2001). Nevertheless, it is worth noting that the disability variables in table 2 indicate a propensity to conceptualise disability in medical terms. Keeping cognisance of the social model of disability, we propose the addition of illiteracy as a disability.

7. Illiteracy as a disability

The literacy referred to is the technical know-how necessary for the effective utilisation of Information and Communication Technologies (ICT's), which Idiodi (2005:224) terms *information technology literacy*. The adoption of Information Technology necessitates the examination of the various concepts. We observed that illiteracy in the context of ICT's adoption is an under-defined concept. The World Bank (2008:4) defines disability as "*when barriers in the environment interact with a person's functional status in a way that limits their participation in society.*" In this "social model" of disability, the physical, cultural and policy environmental factors are considered in the above stated definition. Based on the World Bank definition of *disability*, we are of the opinion that a citizen who fails to utilise e-government due to ICT illiteracy is disabled. Consequently any strategies to implement fully inclusive e-government initiatives should clearly elucidate illiteracy as a disability, and suggest remedial strategies. Based on Idiodi's (2005:224-225) reviews of various frameworks, strategies aimed at eradicating illiteracy disability in e-government should achieve the following objectives;

- Citizens recognise that lifelong learning and participative citizenship requires information literacy.
- Citizens' ability to locate and access information effectively and efficiently.
- Citizens' ability to organise, apply and communicate information to others in ways appropriate to the situation.
- Citizens' ability to compare and evaluate information obtained from different sources.

The importance of minimising the effects of technical illiteracy was highlighted in our previous study (Kaisara & Pather, 2009:12), where citizens expressed an expectation of government to train them (thus imparting technical literacy) so as to empower them with the necessary skills to access e-government services. Without training, e-government websites will remain "like Cadillacs in rural areas" (Dagron, 2001:4), impressive to have but not serving any useful immediate need.

Language used in the presentation of e-government content is also an important dimension of illiteracy. Gomez, Ambikar & Coward (2009:40) found that in South Africa lack of content in one's local language is one of the factors that hinder e-government adoption. Dagron (2001:3) estimates that between 50 and 70 percent of all web pages are in English. To evaluate the South African situation, we assessed the nine provincial government websites and the national portal (Batho Pele website).

Table 4: South African national and provincial government websites

Website	Home Page Language	Other Languages
National Portal (www.gov.za)	English	None
Eastern Cape Province (www.ecprov.gov.za)	N/A (Under construction)	N/A
Free State Province (www.fs.gov.za)	English	None (budget)
Mpumalanga Province (www.mpumalanga.gov.za)	English	None
Gauteng Province (www.gautengonline.gov.za)	Unavailable	N/A
KwaZulu-Natal Province (www.kwazulunatal.gov.za)	English	None
Limpopo Province (www.limpopo.gov.za)	English	None
Western Cape Province		Afrikaans

(www.capecapegateway.gov.za)	English	isiXhosa
North-West Province (www.nwpg.gov.za)	Unavailable	N/A
Northern Cape Province (www.northern-cape.gov.za)	English	None

Consistent with Dagron's (2001:3) assessment, English is the primary language used in the ten government websites surveyed. South Africa, as a multi-cultural nation with 11 official languages, seems to have adopted the easy way out to offer e-government content in these "universal" languages. However, with most of the government websites at the rudimentary cataloguing phase, future developments may include offering content in various languages.

8. Conclusions

The lack of awareness regarding the importance of the accessibility of websites and lack of accessibility policies are some of the major aspects that encumber the accessibility of e-government websites (Abanumy *et al.* 2005:104). The formulation and implementation of policies will help e-government managers to design socially inclusive websites, which is an essential requirement in e-government websites. e-Government implementation cannot achieve social inclusion on its own, but rather a socio-technical approach should be incorporated into the formulation of strategies for its successful implementation (Damodaran, 2005:11), taking into account prevailing social concerns. In the process of the formulation of the strategies guiding e-government implementation, important and relevant concepts such as "*who is a disabled person*" need to be defined. It is not within the scope of this paper to enter into a philosophical debate on the definition of disability, but rather to highlight the importance of fully socially inclusive e-government initiatives. However, we wish to acknowledge the necessity to fully define "disability" in the context of e-government.

Finally, concerted efforts towards the protection and promotion of the rights of persons with disabilities may attract international donor funds, which are critical for a developing country such as South Africa. The securing of funds may allow governments to acquire the needed expertise to develop sophisticated e-government websites, thus involving the disabled in the information society.

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