Accessibility Among Web Sites for Aboriginal People in Canada

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ABSTRACT
Most web based information and services are not accessible by people with disabilities. Since Métis, First Nations and Inuit people (collectively the Aboriginal people of Canada) have a higher incidence of disability than the Canadian average they are disproportionately affected by accessibility barriers. Aboriginal peoples are traditionally marginalized groups already at risk for digital divide effects. This coincidence of accessibility barriers and traditional digital divide effects form a double jeopardy scenario for people indigenous to North America. Therefore, web sites targeted at traditionally disenfranchised minority groups must be accessible by those who use assistive technology.

For the past eight years, I have worked with non-profit organizations and departments of the Canadian federal government to implement online social programs for Aboriginal people. Recently, I have been working to raise awareness among my Aboriginal clientele of the needs of Internet users who are disabled. I often encounter resistance to retrofitting legacy web sites to conform to Web Content Accessibility Guidelines (WCAG). This additional work is often viewed as an added expense rather than a cost of remediying a deficiency. The client invariably asks: “Why should we make the site accessible?”

Organizations that create web sites for Aboriginal audiences should ensure that their web sites are accessible for this reason: Aboriginal people are at greater risk for disability than Canadians as a whole. This translates into a proportionally greater fraction of the population affected by disabled accessibility barriers. Since low socioeconomic status and traditional disenfranchisement conspire to make Aboriginal people also at risk for traditional digital divide effects, the net result is a double jeopardy scenario in which a proportion of the population, after gaining access to the Internet, cannot use the information found there. The magnitude of the barrier that renders home pages unusable by Aboriginal people who use assistive technologies was previously unknown. This paper begins to quantify this barrier by examining web sites operated by non-government organizations providing information or services to Aboriginal people. Web sites that provide online information and services to Canadian Aboriginals must have accessibility features that make them usable by people with disabilities.

Categories and Subject Descriptors

General Terms

Keywords
Accessibility, Usability, Disability, Evaluation, Policy, Aboriginal, Indians of North America.

1. INTRODUCTION
For the past eight years, I have worked with non-profit organizations and departments of the Canadian federal government to implement online social programs for Aboriginal people. Recently, I have been working to raise awareness among my Aboriginal clientele of the needs of Internet users who are disabled. I often encounter resistance to retrofitting legacy web sites to conform to Web Content Accessibility Guidelines (WCAG). This additional work is often viewed as an added expense rather than a cost of remediying a deficiency. The client invariably asks: “Why should we make the site accessible?”

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2. LITERATURE REVIEW
2.1 Aboriginal People of Canada
The Aboriginal people of Canada, collectively the Métis, First Nations and Inuit people, are an obvious cohort to study for digital divide effects. These three ethnically distinct groups, recognized by the Canadian Constitution Act of 1982, are unique in their shared history of colonialism and systematic persecution by the Canadian government [22, 2]. “Status Indians” (synonymous with “registered Indians”) and “treaty Indians” make up a subset of Aboriginal people who are distinct due to recognition under the Canadian Indian Act and possibly due to additional federal treaty obligations [12]. According to the 2001 Canadian Census, people who self-identify Aboriginal ancestry make up approximately 3.3% of the population (976,305 individuals) [24].
2.2 The “Digital Divide”

Research on socially marginalizing or stratifying effects of technology, so called “digital divide” effects, is primarily focused on identifying and ameliorating the effects of social inequity. For the purposes of this paper, “digital divide” will refer to the gap that exists between those members of society who have use of Internet based information or resources and those who do not. The “divide” discussed herein refers to the differential between Aboriginal people who do not use assistive technologies to use the Internet and Aboriginal people who access Internet resources and information using assistive technologies (see Table 1).

<table>
<thead>
<tr>
<th>Aboriginal people who do not use assistive technologies.</th>
<th>People in Canada who do not including Aboriginal people.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aboriginal people who use assistive technologies to access the Internet.</td>
<td>People in Canada who use assistive technologies to access the Internet (not including Aboriginal people).</td>
</tr>
</tbody>
</table>

Table 1. Table of Key Cohorts

2.3 Aboriginal People and the Internet

Aboriginal people in Canada are at risk for digital divide effects since they fare poorly when compared with the Canadian mainstream. The Report of the National Broadband Task Force released by Industry Canada in 2004 concluded [15]:

“If we use the three main indicators of quality of life - wealth, learning and health - to compare the situation of Canada’s Aboriginal peoples to that of other Canadians, we find gaps so large that they constitute a real divide.”

This conclusion is reinforced by Indian and Northern Affairs Canada’s Community Well-Being Index report that found “First Nations, taken as a group, do exist in substandard conditions” [20]. Do these prognostic indicators then translate into lower levels of Aboriginal Internet use?

The answer is “yes”, primarily because Aboriginal community connectivity to the Internet is lower than that of non-Aboriginals [1]. Although, the Aboriginal Connectivity in Canada report concluded that the “Aboriginal/Non-Aboriginal digital divide seems to be a function of urban vs. rural infrastructure,” the report only investigated community wide connectivity and not the use of the Internet by end users [13]. In “From Unequal Access to Differentiated Use”, the authors said that “if we mean...able to get online in some fashion at some location, then inequality is much diminished. If access means using graphically complex Web sites from one’s home, differences among groups remain substantial” [9]. In fall of 2004, the National Aboriginal Health Organization released Preliminary Findings of the First Nations Regional Longitudinal Health Survey (RHS) 2002-03 in which they concluded: “There is a ‘digital divide’ — proportionately fewer First Nations than Canadian homes have telephones, computers and Internet service” [18]. Appropriate studies must now be mounted to quantify Internet use by Aboriginal people. The danger of indolence is that after spending millions of dollars to get a connection to every Native and Inuit community in Canada the result will be the Internet equivalent of a dial tone.

2.4 What is a “Disability”?  

The term “disability” has many connotations and no single definition [11]. For our discussion, the definition most suitable is the ecological perspective advocated in the World Health Organization’s International Classification of Functioning, Disability and Health (ICF). This model considers “disability as resulting from the interaction of impairment, activity limitations and participation restrictions in a specific social or physical environment” [11]. Under the ICF, “functioning is an umbrella term encompassing all body functions, activities and participation; similarly, disability serves as an umbrella term for impairments, activity limitations or participation restrictions” [29]. Under this definition, low-vision users who might otherwise have very good functioning at work and at home, would be severely affected in an online environment because of their inability to navigate inaccessible web pages. These web pages as a factor of the online environment magnify their disability and cause a concomitant decrease in their functioning.

2.5 Aboriginal People and Disability

Although there have been studies done on connectivity, technology adoption and other typical measures of the digital divide among Aboriginal communities, very little investigation has been conducted on Canadian disabled accessibility issues and Aboriginal people despite the well known correlation between Aboriginal ancestry and poor general health. The 2000-2001 Canadian Community Health Survey reported that the Aboriginal disability rate for ages 15 to 64 was 30%, for ages 65 and older was 53% and overall was 31% [24]. Statistics Canada’s “How Healthy Are Canadians? Annual report 2002” found that off-reserve Aboriginal people were 1.6 times more likely to self-report a long term activity restriction [25]. This was a decrease from data extracted from the 1991 Aboriginal Peoples’ Survey which found the odds to be 2.4 times [19]. In both cases, Aboriginal people are more likely to experience disability compared to Canadians; they differ only by degree.

2.6 Web Accessibility Initiative & WCAG

The Web Accessibility Initiative (WAI) “pursues accessibility of the Web through five primary areas of work: technology, guidelines, tools, education and outreach, and research and development” [28]. WAI is part of the World Wide Web Consortium which develops technical standards for the Internet.

WAI oversees the development of the Web Content Accessibility Guidelines (WCAG) which is a “reference document for accessibility principles and design ideas” [6]. Web developers use WCAG to help them create web sites that are accessible by people with disabilities. The guidelines have three groups of checkpoints of decreasing priority: Priority one checkpoints are required in order for most affected groups to use the resource. Priority two checkpoints are guidelines that should be followed or else some groups may find using the resource difficult. Priority three checkpoints may be followed to make the resource available to the widest possible audience. Conformance to the WCAG is denoted by three conformance levels: Level “A” indicates that all priority one checkpoints are met. Level “double-A” indicates that all priority one and priority two checkpoints have been met. Level “triple-A” indicates that all priority one, two and three checkpoints have been met.
3. METHODOLOGY

A convenience sample of 47 candidate web sites was compiled from the Aboriginal Canada Portal (ACP) (http://www.aboriginalcanada.gc.ca/acp/site.nsf/en/ao20001.html). This resource contains links to web sites which provide online services or information of interest to Aboriginal people. Candidates were chosen from ACP primarily because of the broad support it received from key Aboriginal organizations. The portal is operated by the Government of Canada in cooperation with the following Aboriginal government organizations (constituency in brackets): The Congress of Aboriginal Peoples (off-reserve Aboriginal), Métis National Council (Métis people), Assembly of First Nations (First Nations), and Inuit Tapiriit Kanatami (Inuit people). It was assumed that the links presented would be current and comprehensive because of Aboriginal participation, community support and government operation. All the candidates selected were web sites directed at a national audience and operated by non-government, non-profit organizations.

Letters providing details on the study, information on the investigator and instructions on how to opt out of the study were mailed to the contact address provided on the candidate web sites. As a result of the mailing, two agencies elected to withdraw from the study and their web sites were not examined. The English language home pages of the remaining 45 web sites were inspected using an automated software tool which tested them for conformance with the Web Content Accessibility Guidelines (WCAG) version 1.0. Web sites that failed any of the tests were manually inspected to verify the reason for failure and to eliminate false positive results [16]. During the investigation phase, conducted in late October 2004, one web site was unavailable for testing and it was flagged for a follow-up examination. A visit to the site one week later found it beset by the same problem which rendered the site unavailable. Since the candidate could not be analyzed, it was removed from the study. The results were tabulated and analyzed using a spreadsheet.

4. RESULTS

4.1 Most of the Web Sites Tested Were Not Accessible

The key finding of this study was that most web sites examined which provide services or information of interest to Aboriginal people were not accessible to people with disabilities. As shown in Table 2, eighty-six percent (86%) of the forty-four (44) web sites tested failed the most basic level of accessibility (conformance level “A”) as defined by the Web Accessibility Initiative’s Web Content Accessibility Guidelines 1.0 [6]. Figure 1 illustrates the small fraction of candidates that passed.

<table>
<thead>
<tr>
<th>Table 2. Web Sites Which Passed or Failed Testing</th>
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<tbody>
<tr>
<td>Candidates</td>
</tr>
<tr>
<td>Fail</td>
</tr>
<tr>
<td>Pass, at least level “A”</td>
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<tr>
<td>n=44</td>
</tr>
</tbody>
</table>

4.2 Sites That Were Accessible Met Only Basic Levels of Accessibility

Most of the tested web sites that did not fail the automated accessibility testing only met the most basic level of accessibility. As shown in Table 3, two (2) of the six (6) web sites that passed all priority one checkpoints subsequently met priority two checkpoints (level “Double-A”). None of the tested sites met all checkpoints (level “Triple-A”).

<table>
<thead>
<tr>
<th>Table 3. Degree of Accessibility</th>
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<tbody>
<tr>
<td>Candidates</td>
</tr>
<tr>
<td>Pass, level “A”</td>
</tr>
<tr>
<td>Pass, level “Double-A”</td>
</tr>
<tr>
<td>Pass, level “Triple-A”</td>
</tr>
</tbody>
</table>

n=44
5. DISCUSSION

5.1 The Benefits of Making Web Sites Accessible
The obvious benefit of making candidate web sites accessible is that the provided information and services will reach more of their intended audience. It is likely that those who would use online services most are in fact people with mobility disabilities taking advantage of the promised “death of distance” [4]. In addition to increased participation, the Benton Foundation in their 1999 report Native Networking noted “three basic areas of tribal participation are readily apparent: community and cultural development, economic development, and political empowerment” [5]. The term political empowerment refers, in large part, to sovereignty which has been so elusive for Aboriginal people and is now being tested by creative Native leaders.

Exercises in sovereignty and self-determination are being conducted by technology savvy Aboriginal communities. The Mohawk of Kahnawake aggressively exploited the evolution of Internet gambling by doing two things: First they opened Mohawk Internet Technologies, a colocation Internet Service Provider located on the Kahnawake reserve. Second, they established the Kahnawake Gaming Commission to oversee the regulation of online gambling operations. Taken together, this bold initiative is a perfect example of how technology can facilitate digital expressions of sovereignty [17].

5.2 Protection of Culture
One of the pitfalls of research of this kind is a normative implicit assumption that all Aboriginal people must go online. While many stand to benefit from Internet communication, this may not be the case for all people and all communities. The decision to go online must be made by the community and by the individual in consultation with trusted experts, leaders and elders. The historical policy of the Canadian government has been one of assimilation, where Aboriginal languages and culture were deemed inferior to Anglo-Saxon ethos. This policy was manifested in such things as the denying Aboriginal people the right to vote until 1960, the legacy of residential schools, the theft of Métis land by “scrip” and the loss of Indian Status by women who married non-Indian men [14, 2]. It follows that Aboriginal peoples should be wary of new technologies that could potentially cause the further loss of culture or theft of intellectual property and traditional knowledge [27]:

“And not only their land is being coveted and taken so is their knowledge. Multinational corporations have discovered its commercial potential, and the race is on to patent, privatize and appropriate.”

This caveat from the UN’s Human Development Report 2004 should be duly considered. These risks are not only theoretical. The Internet brings encyclopaedias and pornography with equal ease; the network is indifferent to the payload it carries. The remote Aboriginal community considering getting connected to the Internet would be well advised to consider the risks as well as the rewards.

5.3 A Policy Perspective
Aboriginal non-profit organizations and Aboriginal governments must begin to tackle the issue of accessibility from a policy level. In addition to further quantitative study, Aboriginal leadership must be induced to implement organization wide changes to the way information is created and disseminated, while ensuring accessibility. This perspective is supported by Princeton’s Paul Di Maggio and Northwestern’s Eszter Hargittai’s call for action in addition to further quantitative study when they advise [8]:

“Go beyond documenting inequality to developing and testing models of the processes that engender or ameliorate inequality by mediating the relationship between individuals’ social identities and their access to and use of new technologies”

In order to increase accessibility, appropriate resources must be made available to service providers and Aboriginal organizations so that they can integrate accessibility heuristics into their online service and communications activities. It remains to be seen if there exists the “political will…to enable integration of technology throughout society” [3].

5.4 Economic Development Aspects
Digital divide effects and economic development are closely related. In Access to What? First Mile Issues for Rural Broadband, the authors argue persuasively that the “best current investment strategy for accelerating deployment of rural broadband should be aimed at creating the conditions for initial community economic development outcomes in the new economy that stimulate effective usage, rather than emphasizing development of physical infrastructure and access” [7]. For Aboriginal communities this means a push not only for connectivity, but also for capacity building in order to fully exploit the Internet connection. Leaders within Aboriginal communities must recognize the importance of identifying and ameliorating all barriers that make up the digital divide, not just the access component.

5.5 Mandating Accessibility
Providing incentives for making online information accessible is one strategy that should be investigated. Government agencies which provide public money to non-profit organizations to complete online projects should require that the sites meet some standard of accessibility as a condition of the contribution. In Canada, the federal government provides funds to non-profit agencies in two ways. A “grant” refers to an “unconditional transfer of funds” from the government to the recipient whereas a “contribution is a conditional transfer of funds to an individual, organization or other level of government” [21]. A simple method of ensuring accessibility is to make it a condition of the contribution funding agreement. The additional burden on non-profit agencies should not be onerous. The public would expect that information projects completed with public funds be held to similar standards of accessibility as those produced by the government. All Government of Canada web sites are already required to conform to WCAG “Double-A” [26]. Sufficient funds must be made available to ensure that the recipient will not only produce an accessible product but also provide for ongoing accessibility policy development, staff training and maintenance.
5.6 Use Accessible Technology
In this investigation, it was discovered that many of the web sites that passed the basic level of WCAG conformance were implemented using off-the-shelf content management system software. These systems greatly simplify the procedure for adding and changing online content. When mated with communications policies and procedures which enforce accessibility, the result is a web site that is accessible and easy to maintain.

6. CONCLUSION
There is a need within Aboriginal communities for online services, especially health and government services, yet much of the online development to date is inaccessible to members of our community who are disabled. Over time these services will become increasingly crucial. Every effort must be made to develop and internalize accessibility heuristics within the organization. However, this goal is potentially enjolied by the fact that many talented web developers with years of development experience are ignorant of the techniques used to create accessible web sites. Entrenching accessibility goals within policy provides clarity for staff when negotiating with potential web development service providers.

For smaller organizations, it is frustrating to create a web site and later discover that it requires further work and resources in order to meet the needs of a perceived minority. As philanthropy trends have shifted to project based funding and core funding has been harder to secure, activities such as web site design and maintenance have been deemed low priority tasks. For chronically under funded Aboriginal organizations this behaviour has unintended consequences that undermine the execution of an organization’s mission and their capability to deliver services to their constituents. Since the incidence of disability among Aboriginal people is higher than among the general Canadian population, Aboriginal people are more likely to need assistive technology to access web sites. While all organizations risk creating externalities if their web sites are not accessible to people with disabilities, this problem is proportionally greater for organizations that serve Aboriginal clients. As demonstrated in this study, the barrier to use is large, although not insurmountable. Therefore, it is essential that web sites providing online information or services to Aboriginal people conform to Web Content Accessibility Guidelines.

7. ACKNOWLEDGMENTS
Meegwich to the Canadian Council on Aboriginal Business (CCAB) and the National Aboriginal Health Organization (NAHO) for their helpful comments during the design phase of this study.

Thank you to all 47 organizations that developed the web pages I examined. Your efforts to create online content for Aboriginal people is pioneering work and much needed.

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8. REFERENCES


