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Website Accessibility Issues

in Western Australian Public Libraries

A dissertation submitted in partial fulfilment of the requirements for the degree of

Bachelor of Information Technology (Honours)

by

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Abstract

Website accessibility is a very real and pressing issue for public libraries internationally. Tim Berners-Lee credited with founding the Web, states "The power of the Web is in its universality. Access by everyone regardless of disability is an essential aspect." (Henry & McGee, 2010)

There is wide-spread support for adherence to the *Web Content Advisory Guidelines Version 1.0 and 2.0* (WCAG) throughout Federal, State and Local levels of government in Australia. The *Guidelines* have also been affirmed by the Australian Human Rights Commission, disability advocacy groups such as Vision Australia, and the Australian Library and Information Association. The Australian Government issued a press release in February 2010 which mandates conformance with WCAG 2.0 by 2015 for all government sites. In order to accommodate this, a new transition strategy has been provided by the Australian Government.

While adherence to the *Guidelines* is clearly mandated, the level of adherence within the public libraries in Western Australia has not been tested until now. Public libraries, by their very nature, should be providing an equality of access to their collections and services.

This research assesses the level of adherence to the *Web Content Advisory Guidelines (Version 1.0 and 2.0)* of public libraries within Western Australia. Through on-line website accessibility evaluation tools, manual checklists, surveys and interviews, this research identifies the level of compliance to these *Guidelines* as well as the implementation barriers and level of understanding within Western Australia.

The assessment of the website accessibility of public libraries in Western Australia operated as a case study methodology incorporating both quantitative and qualitative assessment tools. An analysis of the research methods and findings is provided in this dissertation.

The findings of the research demonstrate that at present no public library website in Western Australia with an on-line catalogue link, other than the State Library of Western Australia, conforms to the WCAG Version 1.0 or 2.0 at any level of compliance. Libraries identify a number of barriers to implementation of the guidelines including lack of understanding of the necessity of compliance, lack of understanding of the benefits of compliance, time and cost.

The theoretical framework suggested in this research suggests that with increased understanding of the issues and increased support, libraries should be in a better position to work toward website accessibility.

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I wish I could tell all of these wonderful people, as well as the other special people in my life that this is the end of the journey, but I fear it is just beginning. I apologize in advance for the next three years.

Chapter 1   Introduction

1.1   The Background to the Study

The World Wide Web Consortium (W3C) has established international standards for website accessibility which attempt to ensure that everyone has the same opportunities to use materials published on the World Wide Web (Web). The Director of W3C, Tim Berners-Lee, acknowledged as the inventor of the Web states, "The power of the Web is in its universality. Access by everyone regardless of disability is an essential aspect." (Henry & McGee, 2010) The most recent version of the *Guidelines* published by the W3C Web Accessibility Initiative is known as *Web Content Accessibility Guidelines Version 2.0* (WCAG 2.0)

In Australia, all government agencies must comply with the WCAG guidelines. Australia.gov.au is now compliant to Level A of the WCAG 2.0 standard. It is striving towards compliance at levels AA and in some cases AAA ("W3C Mission," 2009). The highest level attainable under the *Guidelines*, is "AAA". Other organisations affirming the need to follow the WCAG include the Australian Human Rights Commission, which enforces Section 67(1)(k) of the *Disability Discrimination Act 1992 (DDA)*, the Western Australia State Library, the National Library of Australia, Vision Australia and other disability advocates, and the Australian Library and Information Association (ALIA).

In Australia, any web page published by either an individual or an organisation must adhere to the minimum standard of the WCAG (currently just to version 1.0) to avoid a complaint under the *Australian Anti Discrimination Act 1992*. ("World Wide Web access: Disability Discrimination Act advisory notes: Version 3.3.1," 2009). Very recently, the Australian Government has released the Web Accessibility National Transition Strategy for the "adoption and implementation of Web content Accessibility Guidelines Version 2.0"(Australian Government Information Management Office (AGIMO), 2010a). The Implications of this new strategy for website accessibility compliance will be further discussed in this study.

A study of Western Australian public library websites will determine the level of adherence within this state and what barriers the libraries face in complying with the above standards.

1.2   The Significance of the Study

Public libraries in Western Australia are operated by local government councils. Resources have typically been purchased through a cooperative agreement between the councils and the State Library, with State Library-owned items rotating on a monthly basis. Each council chooses its own Web interface, and some small local libraries may not have a website at all for remote access to the catalogue. Councils with more than one branch library typically utilise a shared catalogue system between their branches.

Initial research indicates that there has not been a study published regarding the issue of website accessibility in public libraries in Western Australia. Conducting a study to determine the level of adherence to standards is crucial to ensure that inclusiveness is maintained in our publicly-funded library systems.

ALIA states

> The aim of these guidelines is to provide benchmarks for an acceptable minimal level of service which can be used by all libraries in analysing the current level of service, in facilitating forward-planning and in developing strategies for more-effective services. It is recommended that these standards be regarded as minimum requirements and that, given the rapid developments in technology in this area, they be reviewed every two to three years. ("*Guidelines on library standards for people with disabilities,*" 2005)

The importance of having a website that provides accessibility to a greater audience has been demonstrated by the case of the 2000 Olympic Games in Sydney. In this instance, Bruce Maguire, a visually impaired individual, sued the Sydney Organising Committee for the Olympic Games (SOCOG) over the fact that he was unable to access the Website for the Sydney Olympics. The Federal Court found in favour of the claimant and he was awarded substantial damages (Pedlow, 2002).

Website accessibility compliance with the WCAG guidelines is a legal necessity and binding under Australian law. There appears to be a significant gap between Australian Government requirements for all government websites and the level of adherence to the guidelines in Western Australian public libraries. The guidelines have been endorsed by all levels of government in Australia, from Federal to State and Local governments. In addition, they are reinforced by agencies such as ALIA and the various advocacy groups. The new *National Transition Strategy* (Australian Government Information Management Office (AGIMO), 2010a) will have significant impact upon libraries which will be discussed in later chapters.

The findings of this study will serve to inform libraries within the State of the collective level of adherence to the standards, as well as highlighting the barriers which may be preventing a fuller compliance.

1.3   The Purpose of the Study

The purpose of this study is to determine the level of adherence to the W3C standards within public libraries in Western Australia. Ascertaining the current state of accessibility within this sphere is crucial to determining whether the needs of people within Western Australia who have accessibility-related impairments are being met by publicly-funded libraries. While it is acknowledged that there are many different impairment categories, this study will be limited to those individuals with a visual impairment, and specifically their ability to access web-based services in Western Australian public libraries. Additionally, the study will look at the barriers to conforming to the standards and what areas need to be addressed to assist public libraries in meeting this goal. It was originally anticipated that the study would focus on WCAG 1.0 as the Australian Human Rights Commission recognised it as its benchmark for website accessibility until it completed the process of implementing its recommendations for WCAG 2.0.("World Wide Web access: Disability Discrimination Act advisory notes: Version 3.3.1," 2009) However due to the new requirement by the Australian Government to transition to WCAG 2.0 in June 2010, the study will measure compliance to both WCAG 1.0 and 2.0.

1.4   Research Questions

The principal research question addresses the primary aim of this research, which is to assess the level of adherence to the WCAG Version 1.0 and 2.0 in the public libraries within Western Australia. The basic level of adherence will be tested through a website audit.   The website audit will include an the on-line accessibility checking tool.

1.4.1   Principal Question

- What is the level of adherence in public libraries in Western Australia to the W3C Web Content Accessibility Guidelines, Version 1.0 and 2.0?

1.4.2   Supporting Questions

- Supporting question 1
  - Is there a willingness to conform to the guidelines?
- Supporting question 2
  - What are the barriers to public libraries in conforming to the guidelines?
- Supporting question 3
  - What are the benefits of conformance?

The primary purpose of the research is to determine the level of compliance with the WCAG guidelines. In researching this issue, it is important to determine if and why libraries are facing barriers in implementing accessibility into their websites. The research addresses the supporting questions through the use of surveys and interviews, in order to demonstrate the perception of library administrators of the importance of incorporating website accessibility features.   These barriers have been identified in the Literature and are addressed in Chapter 2.5 of this document.

The survey will aim to uncover further data demonstrating whether libraries are persuaded of the benefits of ensuring their websites are accessible. In Chapter 4 of *Web Accessibility: Practical Advice for the Library and Information Professional,* Sloan lists the following benefits of accessibility:

- Accessible websites promote social inclusion for disabled people by improving access to information, communicating and services.
- Accessible websites can bring financial benefit, both by increasing potential customer base and providing savings in maintenance of the site.
- Accessible websites can result in technical benefits, such as enhanced visibility to search engines, and increased usability in general.
- Legal obligations exist in many countries that require organizations to ensure that accessibility barriers do not lead to discriminating against disabled people when accessing on-line services.(Sloan, 2008, p. 54)

The survey and interviews provide qualitative data and opportunities for further clarification of the problems being faced by libraries in implementing accessibility features, while the automated and manual checking of the websites themselves will provide quantitative data for the study.

1.5   Definitions of Terms or Operational Definitions

Terminology used in the areas of both disability advocacy, especially that related to technological issues, is constantly evolving.

In an effort to be culturally sensitive, the research utilizes the following terms. These terms are those used by disability advocacy groups in Australia.

- Visually impaired: refers to anyone with a vision-related disability, handicap or impairment including blindness, macular degeneration
- Print disabled : can refer to visual impairment, but also includes language difficulties, inability to handle physical reading materials (e.g. turning pages of a book), functional illiteracy, dyslexia, insufficient motor control
- Disability: refers to general impairments or disabilities not covered by the above

Technological terminology likewise is a constantly evolving field. The following terminology has been used in the research in an effort to maintain consistency.

- Website or web site: a page hosted on the World Wide Web. The term website is most commonly used in Australia, and has been adopted for this research.
- Website accessibility generally refers to the "application of technical solutions to the design of a website in order to render it more accessible to users" (Craven, 2008, p. 2)
- Assistive technology consists of tools (mainly software) provided by third parties which can be loaded on the computer to support the hardware or add functionality e.g. Braille translation for an embosser, or screen reading with high-quality speech synthesis.(Craven, 2008) Examples are 'Jaws' which is a screen reader and 'Dragon Speaking Naturally' which offers additional features for speech recognition
- World Wide Web Consortium (W3C): the body of developers and professionals who develop standards which have been internally recognized as 'best practice'.
- Web Accessibility Initiative (WAI): the division of W3C responsible for the development of the Web Content Advisory Guidelines
- Web Content Advisory Guidelines (WCAG) : the guidelines developed by W3C, currently version 2.0
- W3C HTML and CSS compliance: Guidelines established by the World Wide Web Consortium (W3C) for validation of Hypertext Mark-up Language (HTML) and Cascading Style Sheets (CSS)

Library terminology in this research encompasses the following terms:

- On-line public access catalogue (OPAC): the library's catalogue provided on-line usually both in the library for patron access and through a Web interface provided by the local government council.
- Sponsoring body: typically the local government body responsible for the administration of the library or group of libraries

Chapter 2 Literature Review

2.1 Introduction

One of the most socially important characteristics of the World Wide Web (WWW) is its ease of access for people of all abilities, nationalities, locations and backgrounds. Tim Berners-Lee, Director of the World Wide Web Consortium (W3C), who has been credited with inventing the World Wide Web, has stated that this universality of access regardless of disability is an essential aspect of the Web (Henry & McGee, 2010).

Literature on the subject of website accessibility has been obtained from books, journals, government publications and websites. Although websites are not typically utilized in academic research, in this particular instance they are crucial, as the internationally recognized standards are published in this and for this medium. As this study is looking at websites in particular, the inclusion of website standards from government-recognized organisations has been a focus. The standards recognized by the Australian Government, Western Australian Government, local governments and agencies working as advocates for the different disability organisations have been examined. In addition, material from the United States and Canada, and Europe has also been examined to determine the international recognition of standards and research conducted into adherence to those standards.

Ball provides a very relevant reason for the inclusion of accessibility in a website.

> The increasing pervasiveness of ICT into the realm of the library and information professional offers an opportunity for increased engagement with a wider variety of users. In some instances the characteristics of these users are known and can be directly catered for, but in most cases the user audience is not known. The range of potential characteristics and needs across this largely unknown audience is therefore as great as within the general populace, and on-line resources must be designed and created with this factor very much in mind.(Ball, 2008, p. 25)

The standards for web design, which aim to ensure accessibility for all individuals, have been developed by the World Wide Web Consortium (W3C). The Vision of the W3C is "to lead the World Wide Web to its full potential by developing protocols and guidelines that ensure the long-term growth of the Web"("W3C Mission," 2009). The W3C has developed a Web Accessibility Initiative, the most recent version of which is known as *Web Content Accessibility Guidelines 2.0* (WCAG 2.0). These guidelines now form the international basis for accessibility of web content. The guidelines allow for three levels of compliance A, AA, AAA, where AAA is the highest level attainable for a website. Level A is considered the minimum standard acceptable. The following is taken from the Introduction to these standards on the W3C Accessibility Standards page:

> The Web is fundamentally designed to work for all people, whatever their hardware, software, language, culture, location, or physical or mental ability. When the Web meets this goal, it is accessible to people with a diverse range of hearing, movement, sight, and cognitive ability.

> Thus **the impact of disability is radically changed on the Web because the Web removes barriers (sic)** to communication and interaction that many people face in the physical world. However, when websites, web technologies, or web tools are badly designed, they can create barriers that exclude people from using the Web.
>
> The mission of the <u>Web Accessibility Initiative (WAI)</u> (sic) is to lead the Web to its full potential to be accessible, enabling people with disabilities to participate equally on the Web. (Henry & McGee, 2010)

The W3C has recognized the need to continually introduce new accessibility features into websites in its latest release of HTML5 standards and guidelines. HTML5 is currently in draft form and introduces a new perspective of viewing accessibility features intrinsically, rather than using 'add-ons' to meet the needs of disabled users. Section 1.4 of HTML5 differences from HTML4: W3C Working Draft 04 March 2010 states, one of the advancements of HTML5 is "The focus on accessibility as a built-in concept for new features (such as the hidden attribute, the progress element, et cetera) instead of an add-on (like the alt attribute)." One of the questions in the surveys examined the awareness of accessibility compliance tools and asked whether libraries were aware of this new version of HTML.

Lilly and Van Fleet (2000) discuss the need for accessible web design in the United States, asserting that it is "not just a good idea, it's the law". According to these authors at the time of the study in the United States, more than twenty percent of the general population was living with some form of disability. In that country the *Americans with Disabilities Act (ADA), 1990* applies to all state and local government entities. This Act:

> prohibits discrimination against qualified individuals with disabilities in all programs, activities, and services of public entities. Furthermore, the United States Department of Justice has determined that ADA accessibility requirements apply to the Web...must be prepared to offer those communications through accessible means.(Lilly & Van Fleet, 2000)

On October 8, 2010, President Obama signed into law the "*21st Century Communications and Video Accessibility Act*" which enhances the provision of the Section 508 legislation currently used in the United States to ensure website accessibility. This new law extends the coverage of the previous legislation which has been contested by numerous lawsuits in the United States under the grounds that it did not cover Internet usage. This new law not only confirms the need for website accessibility on the Internet, but extends it to cover mobile devices, emergency broadcast information, television and streaming of television available through the Internet. The purpose of the new legislation is to make sure that communications technology does not disadvantage people with vision or hearing loss.

2.2 Australian Context

In Australia, the Australian Human Rights Commission has published *World Wide Web Access: Disability Discrimination Act 1992 (DDA) Advisory Notes Version 3.3.1*. In early 2009, the Commission was still working toward its recommendations for implementation of the WCAG 2.0, and considered that Level AA of the WCAG 1.0 to be the minimum conformance level

recommended. The purpose of the *DDA Guidelines* is to guide developers and organisations in maximizing the accessibility of their websites, reducing the likelihood of complaints that may be made to the Australian Human Rights Commission. The DDA requires that an organisation provides equal access to information on the Web where it can be 'reasonably provided'. In Australia, this applies to any individual or organisation placing or maintaining a Web page on an Australian server.("World Wide Web access: Disability Discrimination Act advisory notes: Version 3.3.1," 2009) The DDA confirms the *Web Content Accessibility Guidelines* of the W3C as the "most comprehensive set of benchmarks for assessing the accessibility of websites, and represent current international best practice in accessible web design.("World Wide Web access: Disability Discrimination Act advisory notes: Version 3.3.1," 2009)

The Australian Government affirms the necessity of compliance to the WCAG 2.0 standard. In its official website, australia.gov.au, it has implemented a policy ensuring it is compliant to at least Level A of the WCAG 2.0. Its aim is to comply to at least AA and, in some cases, AAA of this standard. To assist with conformance, the Australian Government has published a list of better practice checklists which outline the measures necessary to make materials accessible to all citizens.(*Better practice checklists : practical guides for effective use of new technologies in government / Australian Government Information Management Office.*, 2004). While this material is somewhat dated, it outlines the principles necessary for conformance, with more recent material published on its website.("W3C Mission," 2009) The new Web Accessibility National Transition Strategy (Australian Government Information Management Office (AGIMO), 2010a) is also available online and includes a Work Plan to assist website owners in formulating plans to adhere to the new level of conformance.

The State Library of Western Australia has responded to the need for website accessibility by ensuring that its website conforms to Level A of the *Web Content Accessibility Guidelines 1.0*, as of January 2010. There are still two areas it is working on in this regard, being text transcripts of audio tracks from video files and text equivalent for .pdf files. Although this level of conformance falls below the recommendation, it does set the stage for striving towards meeting at least the minimum WCAG 2.0 guidelines.("Help with accessibility," 2010)

It is necessary to point out that a typical library website would have numerous layers. In order to both build in accessibility features and assess the compliance with WCAG Guidelines, a thorough website audit must penetrate through these layers. The following example (Figure 2-1), demonstrates that to check if an on-line database is accessible; the tool used would need to penetrate nine layers.
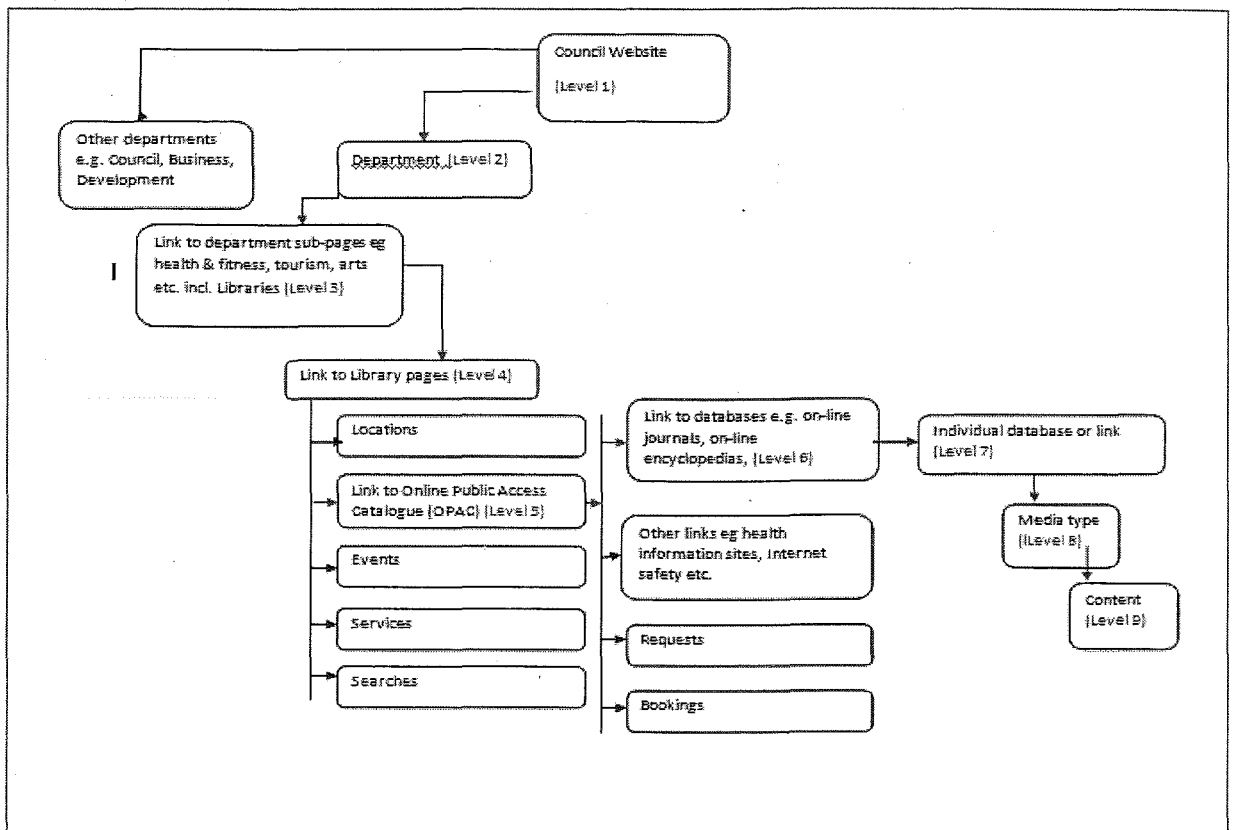
Figure 2-1: Typical Council Website Layout

There are obvious questions that arise from the example given in Figure 2-1 above. For example, a council would need to know who bears the responsibility for third-party content such as purchased database access, and whether all levels and content must meet the guidelines. There would appear to be little point in applying WCAG guidelines to nine levels of a website to reach the final inaccessible journal article. In terms of this research, a decision was made to penetrate as many levels as the tools could handle to test for accessibility guideline compliance.

The National Library of Australia conducted a pilot program, *Information Australia,* which commenced in October 2003 and concluded in 2005. This pilot program trialled a partnership between the National and public libraries to deliver a service that enabled a "Google-type" interface for Australians to access print and electronic resources. A staff paper was released entitled *Evaluating the public library portal* which reflected upon the effectiveness of the pilot program. This paper refers to the necessity of delivering access to the collections in the National Library and public libraries in a manner that is easy to use, timely and relevant for Australians. (Missingham, Wilson, Hedley, & Smith, 2009) The summary of the paper on this pilot program states how the lack of easy access has inhibited patron use of libraries and their collections.(Missingham, et al., 2009) At the end of the pilot program, Information Australia was replaced by the Kinetica search interface now entitled *Libraries Australia*, the gateway currently in use in Western Australia and other Australian public libraries

The Australian Library and Information Association is the professional body responsible for the Australian library and information sector. It asserts the principles of inclusive services for patrons

with disabilities. Its guidelines affirm that a person with a disability should be treated with equal dignity, consistency and consideration in respect to library services and that the onus is on the library, its staff and governing body to show why any limitation exists rather than upon the patrons to prove their right to such a service. It also refers to the *Disability Services Act 1986*, the *Equal Opportunity Act 1995* and the *Disability Discrimination Act 1992* for the fundamental principles outlined therein. *("Guidelines on library standards for people with disabilities," 2005)*

The Western Australian Municipal Association has produced guidelines for all local governments within the State. It articulates clearly that information designed for the public must be made available in easily understood formats. In particular reference to information on websites, the guidelines state:

> Information provided on the Internet website and for e-commerce activities
> should be designed to comply with the W3C Web Content Accessibility Guidelines
> to Level 1; and preferably to Level 2 compliance. ("Accessible information: policy
> and guidelines for local government ", 2001)

From the above, it is obvious that in Australia, individuals and organisations need to ensure conformance to the WCAG, whether working at level 1.0 or 2.0 of the guidelines. A table outlining the major shift in emphasis from version 1.0 to 2.0 may be found at Table 1.1, Chapter 2.4.1. Due to the length of the document, a link is provided in Appendix 1 to a complete mapping of changes between the versions. The aim of any public service should be to strive for the highest level of compliance possible. Failure to strive for compliance will leave an individual or organisation open to claims under the Disability Discrimination Act 1992. In assessing access complaints, the Australian Human Rights Commission considers "the extent to which a service provider has attempted to utilize the best current information and advice wherever it can be found."("World Wide Web access: Disability Discrimination Act advisory notes: Version 3.3.1," 2009)

2.3   Comparable Studies

A study was conducted in 2000 among public libraries in the United States of America. That study looked at the home pages of libraries which were listed in Hennen's one hundred great American public libraries. The findings indicated that at the time of the study, seventy-four of the one hundred public libraries maintained Web sites and of these fourteen were categorized as accessible by the Bobby 3.1.1. on-line evaluation service, offered by the Centre of Applied Special Technology.30 (Lilly & Van Fleet, 2000). At the time of the study, 'Bobby' was a free Web-based service which allowed on-line checking of web pages. Since the time of the study, this utility has been obtained by IBM and now forms part of a commercial suite of applications. The study relied solely on the results of this service and did not use manual analysis and website interaction by the researchers.

The 2007 International Cross-disciplinary Conference on Web Accessibility (W4A) held in Banff, Canada, published its findings in the paper "A web accessibility report card for top international

university web sites" which found that among university sites, "many top universities continue to have accessibility problems"(Kane, Shulman, Shockley, & Ladner, 2007).

In Australia, in 2002 the Queensland University of Technology conducted a project in which its Library was a participant. In particular the report stated that there have been numerous papers written on the need for accessibility for web pages, but few demonstrate how the sites were tested, and even fewer of the sources state how the sites performed or how issues were rectified.(Borchert & Conkas, 2003)

A number of accessibility surveys have been conducted in the United Kingdom in 2002 and 2004. These studies have included 1000 websites, UK university home pages, 100 leading international universities, and 300 museum library and archive websites to determine their level of compliance with the WCAG 1.0 guidelines(Kelly, 2008). The results varied, however of the 300 museums, library and archive websites, 41.6 % complied with WCAG level A (WCAG 1.0), only 3.4 received AA compliance. The authors attribute this low level of compliance to the usual list of lack of knowledge, implementation methods, lack of willingness etc., but also to a problem with WCAG *1.0 Guidelines*. Kelly further states that the publication of the WCAG 2.0 ensures that "the guidelines are more easily understood and provide more flexibility"(Kelly, 2008; Sloan, 2008). Sloan states that "81% of UK sites failing to meet a basic level of accessibility, according to a 2004 Disability Rights commission survey"(Sloan, 2008, p. 49)

A North American study looked at web accessibility in university libraries and library schools in the United States and Canada. This study also utilized the 'Bobby 3.1.1.' tool, however also checked web pages manually the presence of skip-navigation components. This study compared previous assessments to their present findings to determine the improvement in "Bobby-detectable errors." They determined that though there was an increase in accessibility, only fifty to sixty percent of the web sites were free of accessibility errors. (Comeaux & Schmetzke, 2007)

A summary of EVA Conferences, originally known as Electronic Imaging and the Visual Arts, published in 2005, devotes a special section to website accessibility issues.(Hemsley, 2005) The five conference papers presented in the section entitled Special Needs, deal with various disability challenges as well as the need for evaluation tools to assess conformance to e-Europe Action Plan. This plan states "public sector websites must be designed to be accessible to disabled people, whereas UK statistics (2003) show that only approximately one third of websites meet basic web accessibility standards."(Weisen, 2005) The material in this set of conference papers affirms the international scope of the assuring adherence to website accessibility standards.

In terms of accessibility requirements, Australia has embraced the adoption of WCAG to Version 2.0. The National and State Libraries and the Australian Library and Information Association have also embraced these standards. What appears to be untested is the level of compliance. No research discovered to date has attempted to address this lack in Western Australian public libraries. The Australian Human Rights Commission has affirmed that complaints may be made by anyone who feels that they have been disadvantaged regarding access to a website hosted on an Australian server. The Sydney Olympics court case also attests to the legal standard's applicability to websites. Research to date has not discovered if a study has been conducted comparing Australian websites to websites in other countries.

Australia has led the way in legislative background protecting the needs of disabled persons. Sloan (2008, p. 49) states that the United Kingdom based its *Disability Discrimination Act* on Australia's Act of the same name which was introduced in 1992. Sloan also states that at the time of publication (2008), Australia's test case of the 2000 Sydney Olympic Games was the "first-ever successful legal action taken by a disabled person against a provider of an inaccessible website"(Sloan, 2008, p. 49).

2.4   Guidelines: WCAG 1.0 or 2.0?

Until recently, there has been considerable confusion among regulatory bodies in Australia as to whether to adopt the original form of the *Web Content Accessibility Guidelines (WCAG) 1.0*, or move to version 2.0. Version 1.0 was published in 1999 by the W3C. In December 2008, the W3C released its long-awaited Version 2.0 of the guidelines. Until recently, the Australian Government required all Australian Government websites to conform to Version 1.0 of the guidelines. Mr. Graeme Innes, the Federal Disability Discrimination Commissioner, in a presentation to State and Local Government officials in April 2009, stated:

> We believe that Version 2.0 of the Web Content Accessibility Guidelines will establish a new benchmark for web accessibility, and so we have begun a process that will eventually lead to our being able to provide comprehensive recommendations for their implementation in Australia.(Innes, 2009)

On 23 February, 2010, a statement was released from the Australian Federal Government jointly from the department of Finance and Deregulation and the Parliamentary Secretary for Disabilities. This press release stated that WCAG 2.0 standards would now be recognized in Australia as best-practice, and all government websites were to adhere to these standards by 2015. The Australian Government developed its National Transition Strategy for the move to WCAG 2.0 as part of its National Disability Strategy which, as stated previously, was released in June 2010.(Tanner & Shorten, 2010)

In Western Australia, the State Government's requirements are that websites meet WCAG 1.0, however the following graph (Figure 2-2) taken from the *2008/09 Website Report,* demonstrates how far State Government websites need to advance to meet even that target(*2008/09 Website Report*, c.2009). According to the National Transition Strategy mentioned above, State governments are now included in the transition to compliance with WCAG 2.0.

Web Accessibility Compliance
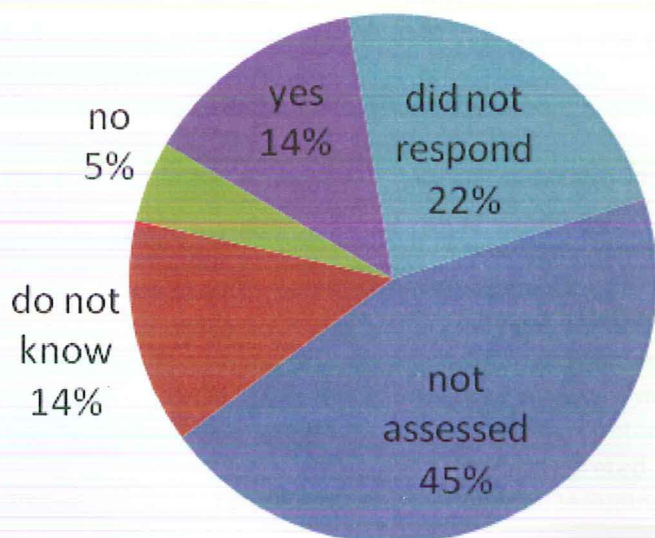
Figure 2-2: 2008/09 Website Report (p.12) - Level of Compliance with WCAG 1.0

The Web Content Advisory Initiative of the W3C has published a comparison table between the two versions of the WCAG. (W3C, 2008) These differences are succinctly described in a *Web 2.0 Accessibility Seminar: Moving to WCAG 2.0*. In short, Version 1.0 contained 14 Guidelines which had 65 checkpoints with priority levels ranging from Priority 1 – Must satisfy this checkpoint for all people to access the content to Priority 3 – May address this Checkpoint to further improve accessibility. Version 2.0 works on four principles: Content must be perceivable, operable, understandable, robust (POUR).

Due to the Australian Government stance on accessibility (WCAG 2.0), it was decided that this research would check website compliance against both levels 1.0 and 2.0 of the WCAG.

2.4.1 Key points of difference between WCAG 1.0 and 2.0

The following information (Table 2-1) has been copied from a paper presented by Roger Hudson prepared for the Web Industry Professionals Association (2009) to aid in the migration from WCAG 1.0 to 2.0. The comparison in the overall shift in design of the guidelines is best demonstrated here.

WCAG 1.0 contained 14 Guidelines with a total of 65 Checkpoints. The Checkpoints are presented in three priority levels.	WCAG 2.0 is built around four basic principles:
• Priority 1: Designers **must** satisfy this checkpoint for all people to able to access the content. (16 checkpoints) • Priority 2: Designers **should** satisfy this checkpoint to remove significant accessibility barriers. (30 checkpoints) • Priority 3: Designers **may** address this checkpoint to further improve accessibility. (19 checkpoints)	• **Perceivable** - Information and user interface components must be presentable to users in ways they can perceive • **Operable** - User interface components and navigation must be operable • **Understandable** - Information and the operation of user interface must be understandable • **Robust** - Content must be robust enough that it can be interpreted reliably by a wide variety of user agents, including assistive technologies
	Within these principles, there are 12 Guidelines which contain a total of 61 "testable" Success Criteria. Success Criteria are to allow WCAG 2.0 to be used where requirements and conformance testing are necessary such as in design specification, purchasing, regulation and contractual agreements.
These priority levels provide developers, and those responsible for promoting and enforcing regulations relating to website accessibility, with an indication of the relative importance of complying with the different checkpoints for people with disabilities.	WCAG 2.0 does not use Priority Levels, but each success criterion is assigned one of three defined levels of conformance: A (lowest), AA, AAA (highest). The Success Criteria conformance levels are used to determine the level of conformance by whole web pages with WCAG 2.0 • **Level A:** For Level A conformance (the minimum level of conformance), the Web page satisfies all the Level A Success Criteria, or a conforming alternate version is provided. • **Level AA:** For Level AA conformance, the Web page satisfies all the Level A and Level AA Success Criteria, or a Level AA conforming alternate version is provided. • **Level AAA:** For Level AAA conformance, the Web page satisfies all the Level A, Level AA and Level AAA Success Criteria, or a Level AAA conforming alternate version is provided.

Table 2-1: Comparison between WCAG 1.0 and 2.0

From material studied to date, it would appear that the overall shift in version 2.0 is towards a more *testable* set of statements. These statements are designed to be *not technology-specific*. Information from the W3C website, and other authors already cited in this research, state that the new guidelines (Version 2.0) have been designed to be easier to understand and have been developed with automated testing in mind. The W3C states that organizations currently conforming to Version 1.0 may not have many changes to make to conform to Version 2.0. Indeed, in many cases if they are compliant to Version 1.0, any changes they need to make may not be significant.("How to meet WCAG 2.0,")

2.5   Barriers to Guideline Compliance

The literature review discovered that many developers and sponsoring bodies feel there are barriers that prevent full compliance with the *Guidelines* referred to previously. It is often assumed that cost, time, technical ability, commitment of sponsoring agency, lack of direct input into website design and other issues discourage full adoption of website accessibility features. The literature review also supported the view that it is possible to overcome these perceived barriers. The theoretical framework of this research hypothesizes that with knowledge of the requirements and issues and sufficient support, we will see an increased probability of compliance with WCAG. The supporting questions in this research have been designed to uncover by means of survey and interview what public libraries in Western Australia perceive to be the barriers in implementation of the guidelines. These guidelines are discussed in more detail below.

2.5.1   Cost of Compliance

Under the guidelines provided by the Australian Human Rights Commission ("World Wide Web access: Disability Discrimination Act advisory notes: Version 3.3.1," 2009), if an organisation wishes to claim unjustifiable hardship created by implementing the WCAG, they must apply for permission to be exempt from a particular access requirement. However, cost is not an issue normally considered appropriate. It must be demonstrated that they have made "reasonable attempts to achieve current best practice", and that this will "generally satisfy the access requirements of the DDA."("World Wide Web access: Disability Discrimination Act advisory notes: Version 3.3.1," 2009) This ability to plead unjustifiable hardship does not apply to Commonwealth Government departments and agencies or other organisations involved in administration of those laws and programs. If an organisation wishes to be considered under this provision, their claim will be "interpreted in the light of the objects of the DDA, including the object [sic] to eliminate discrimination "as far as possible" (emphasis in source)". The above material also states that organisations should keep in mind that complying with the requirements is likely "less relevant as a limiting factor" for website accessibility than in cases of building access or public transportation. It is generally considered by modern building designers, civic governments etc. that providing accessible buildings and transportation systems is crucial to serving their community. According to the material cited above from the Australian Human Rights Commission, providing accessible websites is just as important, and usually much less costly.

It should be considered that there are often cost savings in ensuring that a website is accessible.

Sloan lists the following cost savings (Innes, 2009; Sloan, 2008):

- An accessible web design promotes efficient presentation of information, optimizing navigability and ensuring sites are easier to use. This in turn reduces the load on the server
- Accessible design promotes a separation of content (through cascading style sheets (CSS)) which reduces maintenance
- Encourages the use of design techniques which work in different browsing environments which will ensure that they are able to translate to new technologies as they are developed.

2.5.2   Technical Knowledge and Ability

It is undisputed that development of a website can be costly. Perhaps what is often not considered is that not having an accessible website is even more costly. There are actually technical and cost benefits to be obtained from incorporating web accessibility into a website during planning (Sloan, 2008). Sloan states that search engine optimization (SEO) is a "key consideration in web design, particularly in the retail sector, where the need to have one's website appear at the top of the results of a web search for a particular product has strongly influenced the architecture and design of websites" (2008, p. 45).

Initial development of a website requires both technical knowledge and ability. Most local government councils in Western Australia have Information Technology (IT) departments, and it is these departments who perform the technical implementation of the website. Research results discuss the relationship between the size of the population, staff size and population demographics to the perceived levels of knowledge and technical expertise required for libraries to ensure their website are accessible.

2.5.3   Time and Effort

Any organisation planning a website knows that it takes both time and effort to supply a quality product. It also takes time to become aware of the guidelines and learn how they should be incorporated into any new website. The research results in Chapter 5 discuss the time barriers perceived by staff for complying with website accessibility guidelines.

2.5.4   Awareness of Guidelines and Legal Requirements

The survey that forms part of this research examines the awareness of the guidelines and legal requirements for accessible websites of library management. Publications perused to date suggest that local government bodies have been made aware of the guidelines. In his *Presentation to State and Local Government CEO's* (Innes, 2009), the Australian Human Rights Commissioner clearly expressed the need to abide by the newer guidelines.

According to Howell (2008), there is a greater responsibility for civil servants working in the public sector to abide by the established guidelines due to the legislative requirements. The Disability Discrimination Act does not allow cost to be a factor for government departments in assessing applications for exception ("World Wide Web access: Disability Discrimination Act advisory notes: Version 3.3.1," 2009). Howell states "Those information professionals working in the public sector

are therefore most likely to be aware of the need to ensure that their organization's website is accessible."(Howell, 2008)

2.5.5 Corporate Attitudes

Public libraries in Western Australia fall under the control of local government. This includes the fact that most library websites appear to be connected to that of their sponsoring body.

Determining the corporate attitude of the local government bodies forms part of supporting question one. The survey and interview methods used provide data regarding the level of interest and priority placed on website accessibility.

In addition to Likert-style questions which ask libraries how they feel their council sees the issue of website accessibility, the survey provided open-ended, free-text style questions to provide additional evidence of the level of support offered by council as perceived by staff in implementing website accessibility.

2.5.6 Lack of Control of Website by Library

The question of who controls the content, design and features of the library website was addressed by the surveys. Prior to conducting the research, it was assumed that much of the actual design and control of the library website would come under the control of the local government IT department.

Questions regarding content and control of the website were asked in the survey to determine if the above assumption was correct, with analysis of the results contained in the research discussion. The analysis of the research results also looks at how much input libraries have upon the design and features of website which houses their catalogue and links and whether they feel they have sufficient input to make sure accessibility changes are incorporated.

Chapter 3 Theoretical framework

This research explores the level of adherence of public libraries within Western Australia to the WCAG 1.0 and 2.0 Guidelines. It was observed prior to conducting this research that, although there is widespread support and legal necessity for all websites to design their websites with accessibility in mind, the area of public libraries has been largely neglected. It is assumed that with an increase in awareness and various types of support, a greater proportion of public libraries will improve their conformance to these guidelines.
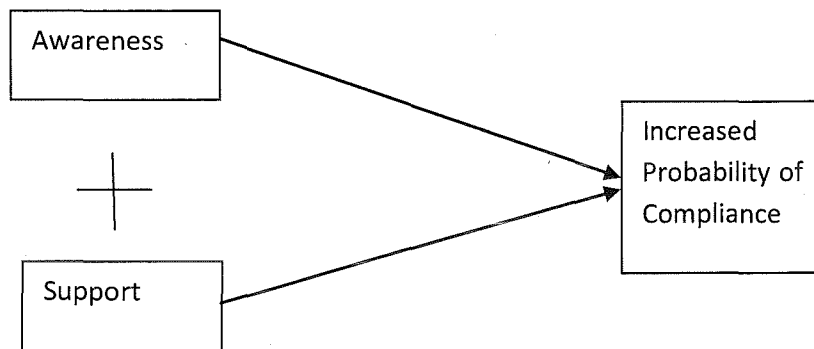
Figure 3-1: Theoretical Framework

The results of the research are discussed in Chapters 5 and 6 and provide evidence of the need for increased awareness of the WCAG guidelines and their implications for public library websites. This research demonstrates where there is a lack of understanding of the guidelines as well as the methods for assessment to achieve compliance. The results also address the issue of whether libraries perceive they have the ability to meet the guidelines.

The benefits of having a website that meet all accessibility and usability guidelines form the basis of supporting question three. Questions regarding this issue were raised in the survey, and the analysis of what benefits the libraries perceived are also discussed in Chapters 5 and 6.

Chapter 4 Materials and Methods

Research, according to Bouma involves "reducing conceptual problems to empirical questions, that is questions about 'things' that can be measured, counted, recorded or in some way observed". He further describes the need to find creative and skilful methods for measuring that data as one of the most challenging aspects of a research project. (Bouma, 2000, p. 14)

4.1. Introduction

In order to capture the required data for this project, a hybrid approach has been adopted which includes assessing the websites through an on-line accessibility checking tool, completing a manual checklist, completing on-line surveys and interviewing selected willing public library administrators and librarians. The purpose of the research as stated in the research questions is to discover the level of compliance with the WCAG 1.0 and 2.0, to determine their accessibility. In discussing website accessibility evaluation, Sloan states,

> The immediate aim of a website accessibility evaluation should be to uncover all *true* [emphasis in original] instances of where a disabled person may have difficulty using or be unable to use the site for its intended purpose and to avoid reporting instances of barriers that do not actually adversely affect accessibility.(Sloan, 2008, p. 73)

This research is not merely intended as an exercise to examine a legalistic interpretation of compliance, but to determine how accessible the website is to a disabled person. The supporting questions, which are more subjective, will be addressed via the on-line survey and subsequent interviews. The responses to the survey and interview questions will provide insight into how librarians and library administrators perceive the importance, barriers and benefits of incorporating accessibility features into websites.

4.2 Methods and Methodology

According to Robson (1993, p. 38), the purpose of 'design' in this context is to turn the research questions into a research project. Bouma (2000, pp. 90-94) describes five basic types of research. These include case studies, longitudinal studies, comparison studies, longitudinal comparison studies, and experiments. From his description of these types, it is apparent that this research project falls within a case study methodology framework; as it will focus on one particular group i.e. public libraries within Western Australia. Further, it is to be an 'exploratory case study' as no hypothesis is being tested, but rather is endeavouring to 'find out what is going on' within this group in the area of website accessibility compliance. This is further verified by the fact that the research is not comparing one group with another or experimenting to find a difference between variables (Bouma, 2000). A case study measures one entity, one point at a time, whilst other research methods deal with more than one entity, or compare studies of one entity at different points in time.

Robson's (1993, p. 40)description of the purpose of the case study approach further justifies its use in this research.

Case study: development of detailed, intensive knowledge about a single 'case', or a small number of related 'cases'. Typical features: selection of a single case (or a small number of related cases) of a situation, individual or group of interest or concern; study of the case in its context; collection of information via a range of data collection techniques including observation, interview and documentary analysis.

Robson further states that there is not a problem using a hybrid approach, and states "there is nothing to stop you collecting a substantial amount of largely standardized survey-type data from a relatively small number of cases" (Robson, 1993). He explains the purpose of "Exploratory" research as:

- To find what is happening
- To seek new insights
- To ask questions
- To assess phenomena in a new light
- Usually, but not necessarily, qualitative (Robson, 1993)

Babbie adds to this list by stating that the research must "satisfy the researcher's curiosity and desire for better understanding, to test the feasibility of undertaking a more extensive study and to develop the methods to be employed in any subsequent study" (Babbie, 2001).

Robson goes on to state that normally the research purpose assists in selecting the strategy and that "case studies are appropriate for exploratory work"(1993). From the above literature this research can be defined as exploratory in nature, and that the most appropriate research methodology is to treat the research as an exploratory case study.

The following sections detail the research design and specific research methods selected for this project. The research project will follow an exploratory research model and will examine the case of public libraries within Western Australia. Three different research methods will be used to answer the primary and supporting questions. The following figure demonstrates this process.

Exploratory Research

Case Study

Methods:

- Surveys
- Interviews
- Website audit
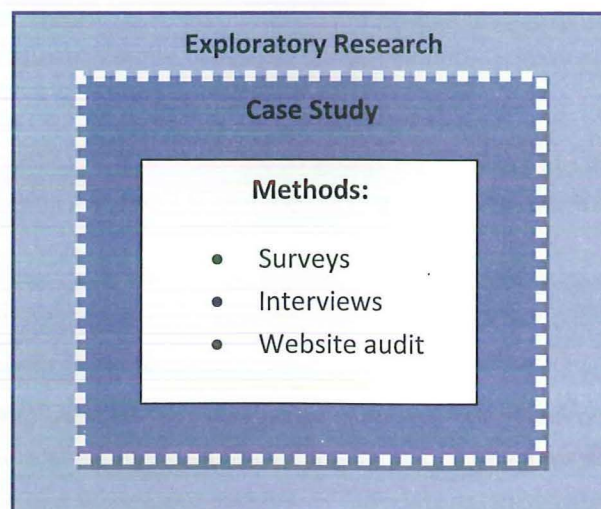
Figure 4-1: Research Methodology

4.3   Research Design

The research takes a multi-faceted approach to data collection. The research incorporates quantitative techniques such as an on-line website accessibility checking tool which provides a report identifying the percentage of pages and image that meet accessibility guidelines. Qualitative data supporting these findings was obtained from surveys and interviews. Initially a list of public libraries within the State was obtained and libraries with on-line websites and catalogues have been identified.

The libraries with on-line websites and catalogues were sent an email as well as a letter requesting their participation in the study. They were asked to complete an on-line survey which presented a series of questions regarding their awareness of website accessibility issues. Where there was a group of libraries operating under a parent organisation, the individual librarians in charge of the branch were also surveyed to determine their awareness of the accessibility issues. The survey also asked whether the library or group of libraries would be willing to participate in an interview to explore the issues and barriers relating to website accessibility. An interview was conducted with willing participants.

An accessibility audit of the websites was conducted utilizing both an on-line website accessibility tools as well as completion of a manual checklist. This data was analysed to determine the website's compliance to the WCAG 1.0 and 2.0 standards.

Libraries without current websites and catalogues were sent a survey to determine their awareness of web accessibility issues. This was designed to elicit further information for the supporting questions, to discover the prevailing attitudes and perceptions regarding the issue of website accessibility and its importance.

4.3.1   Website Audit

Sloan reports that the most effective approach to website evaluation is to utilize the hybrid approach followed in this research study. By using the WCAG, he states that "a more holistic view of accessibility" is possible, focusing on the needs of users of the site, rather than focusing on testing individual pages (Sloan, 2008, p. 92). To this end a checklist of accessibility features was devised and sites were manually assessed for compliance. Two automated on-line accessibility tools were used to cross-check the manual audit results. Finally, the Jaws screen reading software was used to assess selected sites from the perspective of a visually impaired web user.

While the focus of the primary research question was to assess the websites to determine their level of adherence to the WCAG Versions 1.0 and 2.0, the supporting questions were addressed by means of an on-line survey.

4.3.2   Surveys

Survey techniques have long been used to gauge the subjective feelings of the public (Fowler, 2009). Most people will have responded to a survey either by choice or obligation at some time, including assessment of their appreciation of a product or service, or mandatory census surveys. This research included a special-purpose survey. According to Fowler, sometimes a special-purpose survey is the only way to "ensure that all the data needed for a given analysis are available and can be related"(Fowler, 2009, p. 3).

Surveys include various components such as sampling, question design, and data collection. This research project did not require sampling, as all public libraries with websites were assessed and sent surveys. These libraries were also invited to participate in an interview. Public libraries without websites were requested to complete a different survey, as the research endeavoured to capture attitudes toward website accessibility. It is conceivable that public libraries not currently hosting a website may plan to host one in the future; therefore assessing their commitment to the issue is beneficial to this research.

In a survey that elicited both objective and subjective responses, it was important to take all possible measures to ensure valid answers. Fowler describes three possible measures that can be taken to improve validity of subjective responses, including:

- making the questions as reliable as possible ensuring that they have the same meanings for all respondents
- using a relatively large number of categories when using ordered classes along a continuum
- asking questions in a number of different ways to measure a subjective state and then combining the answers into a scale. According to Fowler (2009), "Multiple questions help even out response idiosyncrasies and improve the validity of the measurement process."

The overall research was exploratory in nature and elicited information regarding attitudes, commitment, perceived barriers, knowledge and technical ability relating to website design guidelines. The survey instruments collected this more subjective information and elicited responses that would not be possible from an automated website checking process. The scaling method used was a Likert scale, which is named after its inventor. This instrument typically uses closed response questions according to a scale, requesting the responder to indicate their agreement or disagreement with a short statement on a given range of responses (Bouma, 2000, p.73). In addition to the Likert scale questions, the surveys also used open-ended free-text responses against general guiding questions.

The question of bias due to non-response was addressed by maintaining contact with the libraries to ensure that as many surveys were returned as possible. Fowler describes how non-responses may be interpreted in different situations. While some level of non-response may indicate a lack of interest in the subject material, it may also indicate lack of knowledge of that subject, or merely insufficient time to complete the survey. Ensuring that the smallest percentage of surveys possible are 'non-returns', this research attempted to eliminate any possible non-response bias.(Fowler, 2009)

By delivering the survey instruments on-line for a majority of the libraries targeted in this research, a greater number of responses was expected as the participants do not need to 'leave their computer'. In order to increase potential return rates the on-line surveys were coded in such a way as to ensure the anonymity of the participants and their funding authority. Participants were assured that not only would their survey responses be kept anonymous, but that all results detailed in the final thesis would be anonymous.

4.3.3 Interviews

The interview instrument, as with the survey instruments, will include both open and closed questions in order to elicit as much information as possible. Due to the possibility of influencing or motivating respondents differently, it is important that the interviewer handles the process in a manner that is unbiased and standard for all participants. In this project, one interviewer conducted the follow-up interviews, negating the need for a team of interviewers and requisite training of those interviewers. This ensured a greater level of consistency in interview technique. Initial survey responses for each participant were used as a basis for further questions during the interview process so as to provide validation and explanation of the survey results.

Upon completion of the above, the data will be collated and presented in a final research paper.

Question	Measurement Method
Principal Research Question: What is the level of adherence in public libraries in Western Australia to the W3C Web Content Accessibility Guidelines, Version 1.0 and 2.0	Website audit Checklist
Supporting Question 1: Is there a willingness to conform to the guidelines?	Results of above Survey Interview
Supporting Question 2: What are the barriers to public libraries in conforming to the guidelines?	Survey Interview
Supporting Question 3: What are the benefits of conformance?	Survey Interview

Table 4-1: Research Question and Measurement Method

4.4 Instruments or Materials or Apparatus or Equipment

There has been much discussion regarding suitable methods for evaluating website accessibility. Some of the studies cited in the literature review, utilized only on-line accessibility evaluation tools, while others relied on manual checklists or a combination of both. There are three main methods for evaluating website accessibility (Sloan, 2008). These include:

- Automated tools
- Manual accessibility checklists
- User evaluations

Sloan recommends the hybrid approach which was adopted for this study. This hybrid approach includes examining the site utilizing a checklist which includes features from the WCAG checklist, conducting a website audit and using the *JAWS* program for screen reading against a selection of sites.

Each library assessed was sent via email a letter outlining the study, and requesting participation. The research used online survey instruments available through Edith Cowan University. Email surveys were also sent to libraries without websites.

To audit the websites, two automated website accessibility program were used. In addition, a manual checklist was used. These two instruments used together provided a reliable indication of the accessibility of each website. The reliability of the website accessibility checkers was assessed against the W3C guidelines which cover the different types of tools available. The websites were also validated with the W3C HTML and CSS validation services.

The Australian Government issued its Web Accessibility National Transition Strategy in June 2010. In this document, it states "Agencies are reminded that automated tools provide incomplete conformance information and human assessment is also required" (Australian Government Information Management Office (AGIMO), 2010b).

The final step, interviews, was conducted according to a standardized interview questionnaire to provide optimal input.

Results derived from using these combined methods are included in Chapter 5, together with a discussion of the implications of the research.

4.5   Procedure

1. List the public libraries in Western Australia and determine which libraries have websites with web catalogues.
2. Implement an identification system to ensure anonymity of the individual libraries as well as its sponsoring body.
3. Run website assessments utilizing automated tools and complete a standardized checklist. For example, WebCredible has produced a usable format.("Ten quick tests to check your website for accessibility," 2004)
4. Send a survey to each of the libraries or library group assessed to obtain input and ask whether they would be willing to be interviewed.
5. Send a second survey to the librarians in charge of individual libraries within the state to determine the awareness of the issue of website accessibility for libraries with no websites. It is accepted that this group of interviewees may not have the influence to implement a website or make major changes, however will have insight into patron needs within their community. Some of these libraries may be planning to implement a website and on-line catalogue and their expectation of website accessibility issues is important.
6. Interview representative of each willing library or group of libraries.
7. Collate and report results.

4.6 Diagrammatic Representation of Research Flow
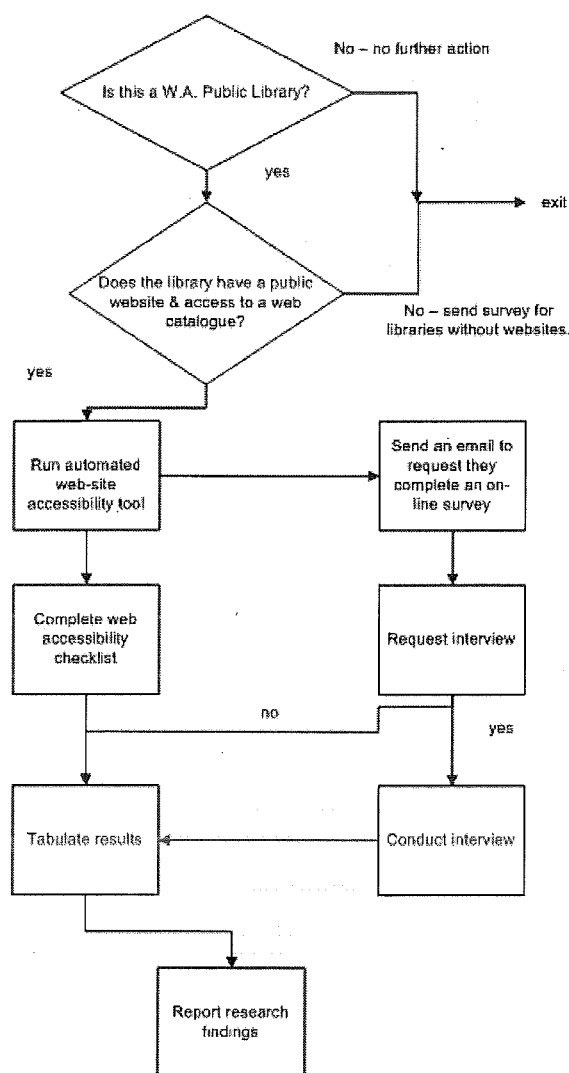
Figure 4-2: Research Design and Flow

Chapter 5 **Research Results**

This chapter has been broken into several sections in order to present the research results in a more cohesive form. The first section describes the website audits, including a brief discussion of the tools used and the results obtained. The second section deals with the two surveys distributed and the results obtained through this means, as well as the results from follow-up interviews conducted. A discussion of the overall implication of the results from all research is provided in Chapter 6. The library websites in this and subsequent chapters are referred to as 'library + identification number" for consistency.

This first section of the chapter specifically addresses the principal research question:

> What is the level of adherence in public libraries in Western Australia to the W3C
> Web Content Accessibility Guidelines, Version 1.0 and 2.0?

A website audit was determined to be the best method of answering this question. As discussed in Chapter 4, current literature suggests the most comprehensive method for auditing websites is through a hybrid approach. The hybrid approach employed entailed the use of a variety of tools including two automated web accessibility testing tools, validation through the W3C site for HTML/XHTML and CSS validation, and a manual checklist made up of critical issues identified in the literature view for this research. In addition, the software tool, *JAWS* was used on a selection of the websites to provide further validation of the audit, as well as observe the usability of the websites for a visually-impaired user. The use of a variety of website auditing methods enabled both the validation of the data obtained, and the reliability of the tools chosen. In order to provide further qualitative data, surveys were sent to two identifiable groups of libraries and these included an invitation to participate in a follow-up interview.

Initially, research through the Australian Libraries Gateway (National Library of Australia) determined that there were 232 public libraries in Western Australia. Further analysis showed that 80 libraries are linked to websites with online catalogues. As a number of these libraries form consortiums (principally through local government shire/city councils), there were twenty-nine different websites with on-line catalogues, other than through the State Library. The scope of this research allowed the auditing of all of the 29 websites, as well as surveying all of the public libraries where email addresses could be located.

In order to preserve the anonymity of the libraries, library identification was removed by generating a random number between 10,000 and 99,999. All identifying information was maintained in a separate spreadsheet. The identifying number was emailed to participants and used in the online survey tool. All of the data analysed by each of the site auditing tools was held together in a separate file for each library/library system for ease of access for comparison and use during interviews. Comparison spreadsheets were compiled with the data from each of the tools, summaries of which appear in the following audit material.

5.1. Website Audit

In order to answer the principal research question a website accessibility audit was conducted of each of the 29 websites identified above. The tools provide a greater depth of information than could be readily incorporated into this research; hence an emphasis was placed on the aspects of the findings which relate to the key area of accessibility. Each of the tools has different strengths and weaknesses and approach the audit procedure from a different angle. It was determined that by using a variety of tools, a reliable and robust picture of the state of adherence to the abovementioned guidelines could be achieved.

The selection of the tools used was based upon their use and reputation in the industry. *SortSite* is a U.K.-based company, whose products are used by "25% of the Fortune 100, and customers include Boeing, NASA, Bank of America, Dell and Microsoft" (Powermapper software, 2010b). *Functional Accessibility Evaluation (FAE)* is funded by the University of Illinois in order to assist companies and web developers to comply with both the WCAG and Section 508 guidelines. (University of Illinois, 2010) *JAWS* is one of the most commonly known of the screen-reading software programs available. Vision Australia, while not endorsing any particular products, provides a link to a number of programs, including *JAWS* (Freedom Scientific, 2010b) and the Web Accessibility Toolbar.

SortSite, is a commercial software tool for assessing websites against WCAG 1.0 and 2.0 and also the *Electronic and Information Technology Accessibility Standards* Section 508 of the *U.S. Rehabilitation Act*. (Powermapper software, 2010b) *SortSite* provides audit details in seven distinct areas which include overall errors (such as broken links), accessibility (WCAG 1.0 and 2.0 and Section 508), compatibility (with different browsers), legal compliance, search engine compliance, standards (such as W3C), and Usability (including W3C best practice). For the scope of this research, the principal data analysed with this tool included the overall error ratio as the accessibility data.

FAE is a software tool available as a freeware application from the University of Illinois. It assesses websites in the categories of navigation and orientation, text equivalents, scripting, styling and HTML standards. While all of the data provided by this tool was assessed, the emphasis was placed on the area of navigation and orientation as this directly affects the usability of the website, a feature which was further compared with the *JAWS* evaluation of a selection of websites.

A manual eighteen-point checklist was compiled which rated the presence and location of critical items identified in the literature review. Checklists are used to validate the automated testing results, as well as to determine how the placement of items in a website relates to their use with assistive technologies, such as *JAWS*. Similar manual checklists (Webcredible, 2010) have been used in recent studies of political party websites in the U.K. Items included in the checklist for this study include critical items demonstrated in this recent research, as well as library-specific features. Figure 5-3 displays the items selected for this checklist and the results are contained in Table 5-5.

The software tool *JAWS* (Freedom Scientific, 2010a) was used on a selection of the websites. The purpose of this analysis was both to determine how usable the website was for someone using screen-reading software, as well as to compare the results of the other tools with the usability

analysis of the site with this tool. The websites chosen were those which scored highest, mid-range, and lowest in the other analysis tools. A discussion of the choice of these websites is provided later.

Finally, the websites were checked for W3C compliance using the Web Accessibility Toolbar (Vision Australia, 2010). This toolbar provides access to the W3C site for validation of both HTML/XHTML and CSS coding. The W3C validates this coding against internationally-recognized guidelines and best-practice.

5.1.1 Website Audit Results

5.1.1.1   SortSite

In the analysis with *SortSite*, emphasis was placed on accessibility. The purpose of using this tool was to analyse quantitatively the level of compliance in answer to the principal research question.

Each of the twenty-nine websites was run through SortSite and then all Priority A errors were entered into an Excel table. As illustrated in Table 5-1, Priority A is the most basic of the standards and is the first step in the National Transition Strategy for website accessibility. The number of times an error occurred was not entered into the spreadsheet, only a number '1' to indicate that that particular website contained that category of error. All of the types of Priority 1 errors were indicated as column headings with the code number of the library/library system shown as row headings.

Sortsite (2010a) defines the level of WCAG 1.0 and 2.0 issues as:

Priority A	disabled users will find it impossible to use some pages
Priority AA	disabled users will find it somewhat difficult to use some pages
Priority AAA	disabled users will find it difficult to use some pages

Table 5-1: Priority A, AA, and AAA Errors

For the purposes of this research, only Priority A errors were analysed. As indicated above, a web page containing this kind of error would be impossible for certain disabled users to use. It should be noted here that there many types of disability, with this research concentrating only on the issues affecting people with visual impairments. Figure 5-1 is an excerpt from a rather large spreadsheet, which contains a total of 70 categories of Priority A errors found throughout the thirty-one websites. This figure is provided to give an overview of the extent of the data collected and the complexity of the issues facing website accessibility. Table 5-3 provides a summary of this data for analysis purposes. All of the websites contained at least seven types of Priority A error (in either WCAG 1.0 or 2.0), with a maximum number of categories of Priority A errors of thirty-six, and an average of twenty-two types of Priority A errors per website. The effect of this error rate is that, according to the WCAG, some disabled users would find it impossible to use any of the websites effectively.

SortSite checks all pages and images that can be followed from the starting link – in this circumstance we chose the library home page within the shire website. The number of pages/links assessed ranged from 99 to 10,008. Table 5-2, which follows, describes the most prevalent errors (90% to 100% of websites contained this category) together with the category (shown in red for Priority A of either WCAG 1.0 or 2.0) and a brief description together with the implications for a disabled user.

Percentage of websites with error	Error Descriptor	Effect of error for people with visual impairments
100%	WCAG2 A F70	This page has markup errors, causing screen readers to miss content. Markup errors like missing end tags mean screen readers may skip important content.
94% of websites	WCAG1 AA 13.1, WCAG2 A 2.4.4	Each A tag must contain text or an IMG with an ALT tag. If there is no link text or the ALT tag is blank, screen readers have nothing to read, so read out the URL instead.
94% of websites	WCAG2 A F25	Some pages have the same title, so the title cannot be used to distinguish pages. Change the TITLE tags so they are unique for each page
94% of websites	WCAG2 A F68	This form control has no associated LABEL element. Add a LABEL tag with the FOR attribute set to the id of this control. This allows screen readers to tell the user what each control does.
90% of websites	WCAG1 A 1.1,WCAG2 A F65	IMG tags must have an ALT attribute. Add an ALT attribute describing each image, which screen readers read aloud.
90% of websites	WCAG1 AAA 4.3, WCAG2 A 3.1.1	Use the LANG attribute to identify the language of the page. In HTML add a LANG attribute to the HTML tag, and in PDF set the language using Document Properties in Acrobat. This allows screen readers to pronounce words correctly.

Table 5-2: Most Prevalent SortSite Errors

In Figure 5-1, each of the 70 categories of Priority A errors for either WCAG 1.0 or 2.0 were listed as column headings as they occurred in the website audits with *SortSite*. The library identification numbers were then listed as row headings. When an error occurred in a category, a number '1' was placed under that column heading. It is important to note that the '1' in the field only indicates that at least one error of that type was found; some websites had over 50 of one type of error. This correlates with the other auditing tools in that a website may fail the W3C validation with over 100 errors, however these may be mainly of one type, or what is explained further in the W3C validation section as a 'cascading' error where one error may cause others, or they may be error types that do not affect the usability of the site, hence not causing manual checklist problems.

Figure 5-1: Excerpt from SortSite Error Table

Library ID: Priority A Asscessibility Errors only - WCAG 1.0 and 2.0: **NB** Priority A errors make it impossible for disabled users to use some pages. **Priority AA -** Disabled users will find it difficult to use some pages

B — Total number of pages/images viewed by SortSite

C — Total number of Priority A, AA, and AAA (WCAG 1.0 and 2.0) issues

D — Total number of pages with Priority A , AA , and AAA Issues

E — The following are ONLY Priority A Issues - disabled users will find it impossible to use some pages.

Summary scores:
- Max.score: 10008
- Min.score: 99
- Av.score: 3068.03
- %age (pages viewed): 95109
- Total issues: 1085
- Total pages with issues: 5399

Page/Image ID totals (column): 24621, 44495, 44844, 77184, 56658, 97613, 93676, 36553, 97502, 75193, 50149, 15273, 86137, 63846, 75023, 1186, 22495, 62194, 93676, 24242, 74430, 16883, 38003, 53815

Pages viewed counts: 2924, 10008, 1458, 6696, 3597, 6945, 9391, 4516, 1817, 370, 837, 300, 6384, 1186, 344, 962, 162, 1458, 2133, 3002, 8023, 3431

Issues counts (col C): 38, 28, 41, 45, 55, 35, 49, 46, 39, 14, 26, 26, 42, 50, 25, 30, 22, 32, 42, 45, 40, 36

Pages with issues (col D): 184, 164, 210, 217, 320, 300, 714, 184, 251, 42, 121, 62, 220, 196, 31, 170, 26, 68, 207, 224, 245, 265

Priority A Issue descriptions (rows F–Z), with %age and Total:

F (48 / 15) — **WCAG1 AA 9.3 ,WCAG2 A F54** : All ONMOUSEOUT handlers should have an equivalent ONBLUR handler. Some users are unable to use a mouse, so use the keyboard instead. Add an equivalent keyboard event handler to help these users.

G (48 / 15) — **WCAG1 AA 9.3 ,WCAG2 A F54** : All UNMOUSEOVER handlers should have an equivalent ONFOCUS handler.Some users are unable to use a mouse, so use the keyboard instead. Add an equivalent keyboard event handler to help these users

H (29 / 9) — **WCAG2 A F38** : Decorative and spacer images must have a blank ALT attribute.Images used for decoration only should have ALT="" so they can be ignored by screen readers.

I (39 / 12) — **WCAG1 AA 13.2 ,WCAG2 A 2.4.2** : Document must have a title. For HTML pages add a TITLE tag. For Office documents and PDF documents produced from Office, fill in the Title in Document Properties before saving as PDF.

J (77 / 24) — **WCAG1 AA 13.2 ,WCAG2 A F25** : Document title must not be blank. For HTML pages change the TITLE tag. For Office documents and PDF documents produced from Office, fill in the Title in Document Properties before saving as PDF.

K (94 / 29) — **WCAG1 AA 13.1 ,WCAG2 A 2.4.4** : Each A tag must contain text or an IMG with an ALT tag. Add text to the link, or ALT text if the link contains an image. If there is no link text or the ALT tag is blank, screen readers have nothing to read, so read out the URL instead.

L (90 / 28) — **WCAG1 A 1.1 ,Section 508 (a) ,WCAG2 A F65** : IMG tags must have an ALT attribute.Add an ALT attribute describing each image, which screen readers read aloud.

M (77 / 24) — **WCAG2 A 1.3.1** : PDFs must be tagged to be accessible by screen readers.: If using Word, enable the "Document structure tags" option when exporting, or use the "Make Accessible" plug-in for Adobe Acrobat.

N (26 / 8) — **WCAG2 A F73** : Removing the underline from links makes it hard for color-blind users to see them. Remove the text-decoration:none property from your link styles, or add other non-color style attributes to distinguish links.

O (94 / 29) — **WCAG2 A F25** : Some pages have the same title, so the title cannot be used to distinguish pages. Change the TITLE tags so they are unique for each page.

P (94 / 29) — **WCAG2 A F68** : This form control has no associated LABEL element. Add a LABEL tag with the FOR attribute set to the id of this control. This allows screen readers to tell the user what each control does.

Q (100 / 31) — **WCAG2 A F70** : This page has markup errors, causing screen readers to miss content. Fix the errors listed on the Standards tab of this report. Markup errors like missing end tags mean screen readers may skip important content.

R (90 / 28) — **WCAG1 AAA 4.3 ,WCAG2 A 3.1.1** : Use the LANG attribute to identify the language of the page.In HTML add a LANG attribute to the HTML tag, and in PDF set the language using Document Properties in Acrobat. This allows screen readers to pronounce words correctly.

S (29 / 9) — **WCAG2 A F86** : All fields in a group of input fields (for example phone numbers) need a label.Add a LABEL tag or TITLE attribute for each field, and if required, use CSS to hide the label from sighted users.

T (35 / 11) — **WCAG1 A 1.1 ,Section 508 (a) ,WCAG2 A H46** : Add a NOEMBED tag with alternative content inside the EMBED tag. EMBED tags must have an associated NOEMBED tag.

U (81 / 25) — **WCAG1 AA 3.5 ,WCAG2 A 1.3.1** : Headings must be nested correctly. For example, H2 must appear after H1, H3 after H2 etc. Renumber headings so that the top level heading is H1, sub-headings are H2 and so on. Use CSS style rules to change heading font styles if needed.

V (74 / 23) — **WCAG1 A 5.1 ,Section 508 (g) ,WCAG2 A H51**: Identify row and column headers in data tables using TH elements. If the table has headers marked up using TD, then change these to TH. If the table has no headers, add TH elements describing each row and/or column.

W (32 / 10) — **WCAG1 AA 12.4 ,WCAG2 A 4.1.2** : LABEL elements should be associated with other controls using FOR attributes. Add a FOR attribute set to the ID of the associated control. Some screen readers ignore labels without FOR attributes.

X (81 / 25) — **WCAG1 AAA 13.6 ,WCAG2 A 2.4.1** : Provide a way to skip repetitive navigation links.: Without a skip link, screen readers read out the navigation links on every page before reading the page content. This often done by having a "Skip to Content" link at the start of the document hidden by CSS, so it only renders in a screen reader.

Y (3 / 1) — **WCAG2 A F86** : All fields in a group of input fields (for example phone numbers) need a label. Add a LABEL tag or TITLE attribute for each field, and if required, use CSS to hide the label from sighted users.

Z (58 / 18) — **WCAG1 AA 13.2 ,WCAG2 A F25** : Document title must not contain placeholder text like 'Untitled' or the page filename.For HTML pages change the TITLE tag. For Office documents and PDF documents produced from Office, fill in the Title in Document Properties before saving as PDF.

ID	Overall	Errors	Sortsite - % of pages with errors in: Accessibility	Compatibility	Compliance	Search	Standards	Usability
32293	18.00	3.00	8.41	2.50	1.11	6.42	11.88	8.92
25979	18.39	3.47	8.52	1.04	0.84	3.09	10.24	7.98
34259	22.26	17.43	6.39	1.20	0.00	3.33	8.03	6.74
18672	12.34	11.42	0.63	0.50	0.32	0.36	2.23	1.47
24621	13.71	2.22	6.29	1.61	0.72	4.89	9.03	4.55
87917	24.53	4.72	23.58	16.04	11.32	16.04	16.04	16.98
67682	50.51	4.04	27.27	4.04	1.01	12.12	33.33	25.25
21332	na	na	Na	na	na	na	na	na
77184	9.89	4.97	3.24	0.46	0.13	1.22	5.08	2.85
56858	31.44	22.44	8.90	2.17	0.92	5.23	5.23	7.48
90916	15.54	13.33	7.60	6.04	6.13	4.11	7.33	6.99
50149	23.89	14.34	14.46	3.82	1.19	7.65	11.95	11.71
86137	8.05	0.94	3.45	0.53	0.41	1.17	5.22	3.13
75023	21.16	4.13	16.53	4.13	0.00	4.64	9.36	10.20
93676	17.90	12.96	16.05	12.35	12.35	13.58	12.96	14.20
74430	35.96	33.43	9.70	1.17	0.98	3.33	10.78	8.44
53815	12.91	4.49	7.69	2.56	2.07	3.67	5.83	6.15
97613	9.24	1.41	0.43	0.69	0.36	1.68	0.43	4.26
36553	27.95	23.36	4.07	1.20	0.64	0.33	5.05	4.58
22495	15.41	12.50	9.01	5.81	6.10	6.98	8.14	13.08
58711	18.52	12.96	17.28	14.20	14.20	14.81	17.28	17.90
59960	19.03	5.61	7.21	2.20	0.76	0.12	0.12	0.08
97502	22.62	3.63	13.81	2.64	2.26	7.98	9.80	10.29
15273	29.67	24.33	20.33	16.00	16.00	23.00	22.00	18.67
62194	23.49	3.53	17.67	0.52	0.00	7.07	7.07	9.77
24242	9.67	4.60	4.66	1.51	1.51	3.77	6.93	5.90
44844	25.72	20.23	14.40	1.78	2.26	3.77	11.25	7.89
16883	34.28	28.48	7.46	2.66	2.80	5.36	12.59	8.29
38003	8.09	3.90	3.05	0.67	0.67	1.51	3.35	2.67
Median	18.78	5.29	8.47	2.19	1.00	4.38	8.59	7.94
Min	8.05	0.94	0.43	0.46	0	0.12	0.12	0.08
Max	50.51	33.43	27.27	16.04	16.00	23.00	33.33	25.25

NB 21332 would not run in SortSite due to .exe in URL

Table 5-3 : SortSite Error Summary

The data in Table 5-3 demonstrates that the lowest percentage of pages and images for overall errors checked by SortSite was 8.05%. The website for library 67682 had an overall error rate of just over 50% which is very concerning as the website in question is not a small single library, but a consortium of a number of metropolitan branches. The SortSite evaluation for this website also indicates that 27.27% of the pages had accessibility problems. This website also scored only 8 out of 18 in the manual checklist. The websites with the lowest percentage of overall errors (8.05 and 8.09) were both metropolitan single-branch libraries. In the accessibility errors, library 97613 has

the lowest error percentage, of 0.43% accessibility errors. This is the library website chosen to represent the top-scoring libraries for the JAWS evaluation.

5.1.1.2 *Functional Accessibility Evaluator (FAE)*

FAE state that the purpose of its tool is to analyse web pages for markup that is consistent with best practices

> ...for the development of functionally accessible web resources that also support interoperability... Following the best practices in developing web resources not only improves accessibility for people with disabilities, but also improves interoperability, giving everyone the benefit of having more options for accessing and using those resources. (University of Illinois, 2010)

The tool was used at the highest setting – "depth of evaluation include third level pages will cause all pages linked from the top and second-level pages..." and "follow links in... next-level subdomains ...links that are in subdomains of the next-level domain (relative to the domain specified by the URL) will also be followed".

The analysis categories supplied by FAE (University of Illinois, 2010) include:

- *Navigation & Orientation:* Inclusion of structural markup that facilitates navigation and contextual orientation;
- *Text Equivalents:* Proper use of images for interoperability and the provision of text descriptions for non-text content;
- *Scripting:* Avoidance of scripting techniques that compromise accessibility and interoperability;
- *Styling:* Use of CSS styling techniques to separate content and structural information from styling and presentation;
- *HTML Standards:* Support for HTML standards to improve interoperability and provide more choices in the use of technologies for rendering web content.

As well as providing a table for each assessment showing the percentage of pages with a pass, warning or fail grading, it summarizes the assessment for each category with a qualitative grade displayed in Figure 5-2. As discussed previously, the emphasis was placed on the category of navigation and orientation as this most affects the use of the website by people with visual impairments. Figure 5-3 provides an example of an FAE summary which demonstrates how the scoring was derived. It shows the qualitative grade as mentioned, as well as the actual percentages of pages receiving a pass, warning or fail grade.

Figure 5-2: FAE Grading Scheme (http://fae.cita.uiuc.edu)

Evaluation Results by Best Practices Main Category

Category	Status ¹	% Pass	% Warn	% Fail
Navigation & Orientation	Partially Implemented	91	1	6
Text Equivalents	Almost Complete	67	31	1
Scripting	Complete	100	0	0
Styling	Almost Complete	98	1	1
HTML Standards	Almost Complete	98	1	1

Note: % Pass includes N/A results.

Evaluation Results by Best Practices Subcategory

Category/Subcategory	% Pass	% Warn	% Fail
Navigation & Orientation			
Titles (title & h1)	97	1	1
Subheadings (h2..h6)	77	1	21
Navigation Bars	90	9	0
Form Control Labels	80	0	19
Default Language	98	0	1
Data Tables	100	0	0
Access Keys	99	1	0
Frames	99	0	1
Text Equivalents			
Informative Images	94	0	5
Decorative Images	37	62	0
Image Maps	100	0	0
Scripting			
onclick	100	0	0
onmouseover & onmouseout	100	0	0
Styling			
Text Styling	98	1	0
Layout Tables	99	0	1
HTML Standards			
W3C Specifications	98	1	1

Figure 5-3: FAE Summary for Library

The results for the 29 websites assessed using this tool are as follows:

Navigation and Orientation:

None of the websites achieved a grade of 'complete' in this section. Library 97613 had the lowest percentage of pages with fail or warning in this category. This was also one of the best-performing sites in the SortSite evaluation. Library 25979 had the highest percentage of fail or warning (30%) in this category and an error rate close to the median in SortSite.

Text Equivalents:

None of the libraries received a grade of complete in this section. Library 50149 had the lowest fail/warning rate (1%), with library 22495 having the highest fail/warning rate of 100%. The errors in this website showed that all of the informative images failed, as did the image maps. All of the decorative images received a warning grade. This website also had 20% with fail/warnings in the navigation/orientation section and 35% fail/warnings in the styling section.

Scripting:

Websites scored higher in this section with 10 of the libraries achieving a 'Complete' grading. In the Fail section, there were no libraries with pages that failed in the Scripting. All pages that did not achieve a pass grade had warnings attached. As scripting was not a focus area of this research in terms of accessibility, this higher performance value may in some way be related to the relatively widespread use of Content Management Systems across government websites.

Styling:

One library (67682) achieved a 'complete' grade in Styling. The highest error/fail rate in this category was library 36553 which one of the highest W3C validation rates of 118 errors, 52 warnings, and 69 CSS errors. In the styling errors here, 100% of the pages checked failed in the table layout section, with a rate of 45% warnings in the text styling.

HTML Standards:

FAE showed that eight libraries achieved a 'complete' grade in HTML Standards. This should not be confused with the W3C Validation which follows. Although it gives an idea of best to worst in terms of HTML standards, FAE only tests to WCAG 1.0, Federal Section 508 Web Accessibility Standards and the Illinois Information Technology Accessibility Act, and not WCAG 2.0.

A description of the FAE rule evaluation in is shown in Figure 5-4.

Rule Evaluation Definitions

Coding patterns can be assigned the following labels for purposes of evaluation. The labels are based on the reliability of the coding pattern to identify known and possible accessibility problems.

Pass
Coding practices that support web accessibility best practices for improving the functional accessibility of web resources are found.
Coding practices that support the implementation of the features W3C Web Content Accessibility Guidelines, Federal Section 508 Web Accessibility Standards and Illinois Information Technology Accessibility Act are found.
Coding practices that are known to cause accessibility problems are not found.

Fail
Coding practices that support the implementation of the web accessibility best practices to support accessibility guidelines and standards are *not* found.
Coding practices that are known to cause accessibility problems have been found.

Warning
Coding practices that are known to improve accessibility but are not directly required by the Illinois Information Technology Accessibility Act.
Coding practices are available to the developer to improve accessibility to pass the requirement and make their web pages more standards compliant.

Check
Coding practice may be an accessibility problem, but cannot be determined through analysis of markup alone. Manual tests needs to be performed to verify accessibility of the markup.
A coding practice requirement for accessibility may be outdated or there is not a consensus that the requirement is currently a web accessibility best practice.

NA
The page does not contain markup related to the rule and the markup is not required for accessibility. For example, when images are not used in a web page, the rules for image text equivalents do not apply to the page

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Figure 5-4: FAE Rule Evaluation Definitions (University of Illinois, 2005)

The summary table demonstrating the FAE results is shown in Table 5-4. For display purposes, the percentage of fail and warnings are displayed as an aggregate to differentiate them from pages which fully comply.

ID	Nav/Orient	Text	Scripting	Styling	HTML St.
FAE = %age of pages with fail or warning grades					
32293	20	23	0	35	0
25979	30	50	50	26	0
34259	19	74	0	28	0
18672	25	36	0	41	36
24621	25	27	18	21	2
87917	23	49	49	22	13
67682	16	25	0	0	0
21332	11	4	1	32	2
77184	15	4	46	18	3
56858	15	58	24	1	0
90916	13	8	0	5	0
50149	13	1	0	1	2
86137	8	34	99	2	0
75023	10	41	50	31	50
93676	14	22	0	17	0
74430	12	24	18	32	51
53815	11	16	24	3	2
97613	7	32	0	2	2
36553	28	31	27	54	2
22495	20	100	1	35	50
58711	10	3	0	3	8
59960	25	6	1	17	2
97502	12	5	1	18	0
15273	16	39	0	2	1
62194	18	4	0	1	1
24242	29	27	25	43	48
44844	15	2	25	1	0
16883	25	73	49	48	54
38003	12	14	21	8	2
Median	15.00	25.00	1.00	18.00	2.00
Min	7	1	0	0	0
Max	30.00	100.00	99.00	54.00	54.00

Table 5-4 : FAE Error Summary

5.1.1.3 Manual Checklist

As discussed in the introduction to this section, a manual checklist was compiled consisting of 18 points considered most critical. These 18 points were identified in the literature review previously and include items specific to library websites, such as the ease of locating membership information, ability to search for items, provision of shire and community information, and catalogue links. The need for this analysis was demonstrated in the literature review as a means to prove a more holistic website evaluation that addressed some of the qualitative elements of website design not dealt with via the auditing tools. The checklist correlates with the JAWS evaluation which follows, and provides a human assessment, to locate any accessibility and usability gaps missed by the automated tools.

The purpose of the checklist was to look at the correlation between quantitative accessibility assessments and qualitative usability assessments. Only one library was able to demonstrate all 18 points, with the lowest rating library in this area scoring four out of a possible 18 points. A copy of the checklist is shown in Figure 5-5 demonstrating desired features, with Table 5-5 displaying the results. Further discussion and comparison of research results through the different assessment tools is provided in following sections.

According to Kuzma (2010), "...

> ...a manual check may show that the text within the alternative tags is not meaningful and may not correspond to the actual picture, thus leaving a sight-challenged person confused. Thus, for an in-depth analysis of a site, the designers should use a combination of automatic and manual checking.

Library Website Checklist

Library Group Name:

Description	Yes	No	n/a
1. Accessibility features are easy to find			
2. Prominent 'contact us' link with details			
3. Clear text resizing controls at top of the page			
4. Clearly marked home link on every page			
5. Homepage lists key tasks			
6. It is easy to find shire and community information			
7. It is easy to find general library information			
8. It is easy to find out how to join the library			
9. It is easy to find a catalogue link			
10. It is easy to order an item			
11. There is a simple site map			
12. There is prominent search feature			
13. The search feature is easy to use			
14. Search results are simple to interpret and useful			
15. Low bandwidth version of the page is available			
16. Language translation link is available			
17. ALT tags are present for all images			
18. Presentation – well laid out and inviting			
Score /18			

* Notes:

Figure 5-5: Blank Checklist

The sample checklist in Figure 5-5 uses the word 'easy', the meaning of which may be open to interpretation. For the purpose of this research, it is defined as the ability to go to the site and readily locate the information required, such as how to join the library. The information required should be prominently displayed so that very little searching, if any, is required.

As can be seen from the scores in Table 5-5, only one library website scored 18 out of a possible 18 points (or 100%). The average score was 11.34 (63%), with a minimum of 4 (22%). All twenty-eight of the websites fulfilled one of the criteria, that of the ease of finding general library information. The lowest scores were in provision of low bandwidth and language translation options.

Library ID	87917	67682	58711	32293	25979	34259	18672	59960	24621	21332	44844	77184	56858	97613	93676	36553
1. Accessibility features are easy to find			1						1	1			1	1	1	1
2. Prominent 'contact us' link with details	1	1	1		1	1		1	1	1		1	1	1	1	1
3. Clear text resizing controls at top of the page									1					1		1
4. Clearly marked home link on every page			1			1		1	1	1	1	1		1	1	
5. Homepage lists key tasks	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
6. t is easy to find shire and community information	1	1	1	1	1	1		1	1	1	1	1	1	1	1	1
7. It is easy to find general library information	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
8. It is easy to find out how to join the library	1	1	1	1		1		1	1	1	1	1	1	1	1	
9. It is easy to find a catalogue link	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
10. It is easy to order an item	1	1	1	1	1	1	1	1	1	1	1	1	1	1		1
11. There is a simple site map			1	1	1	1		1	1	1		1	1	1	1	1
12. There is prominent search feature		1	1	1	1	1		1		1		1	1	1	1	1
13. he search feature is easy to use					1	1		1	1	1	1	1	1		1	1
14. Search results are simple to interpret and useful						1				1	1	1				
15. Low bandwidth version of the page is available			1													
16. Language translation link is available			1													
17. ALT tags are present for all images						1		1	1		1					
18. Presentation – well laid out and inviting	1		1			1		1	1	1	1	1	1	1	1	1
Total /18	7	8	15	8	11	13	4	13	15	13	10	13	13	12	13	11
Percent	39	44	83	44	61	72	22	72	83	72	56	72	72	67	72	61

ID																			Score	%
97502		1		1	1	1	1	1	1	1		1	1				1		11	61
50149		1		1	1	1	1	1	1	1	1	1	1						11	61
15273		1		1	1		1	1	1	1		1	1	1			1		11	61
86137				1	1	1	1	1	1	1						1	1		9	50
75023	1	1	1	1	1	1	1	1	1	1	1	1	1				1		14	78
22495		1		1	1	1	1		1	1	1	1	1			1	1		12	67
62194	1	1		1	1	1	1	1	1	1	1	1	1	1	1		1		15	83
93676		1			1		1		1	1									5	28
24242	1	1	1	1	1	1	1	1	1	1	1	1	1	1			1		15	83
74430	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	18	100
16883		1		1	1	1	1	1	1	1	1	1	1				1		12	67
38003		1			1	1	1	1	1	1							1		8	44
53815		1				1	1	1	1	1	1	1					1		9	50
Total	11	24	6	18	27	26	29	25	29	28	20	23	19	8	3	3	7	22		
%age	37.93	82.76	20.69	62.07	93.10	89.66	100.00	86.21	100.00	96.55	68.97	79.31	65.52	27.59	10.34	10.34	24.14	75.86		

	Score	%
Average score	11.3	63
Minimum score	4	22
Maximum score	18	100

Table 5-5 : Checklist Analysis

Table 5-5 demonstrates that there were very few instances where items five to ten were missing, perhaps indicating that due to the visual nature of these items, such as the display of shire and community information, its provision is assured. Items of a more obscure nature, such as the provision of options for those patrons using connections with limited band width or language translation needs, these items have largely been overlooked in the design of the website. Appendix 2 includes the manual checklists for the websites chosen for the JAWS evaluation, in order to demonstrate some of the notations made regarding placement of the 18 features assessed. The automated tools tend to assess the provision of items, such as links to the home page, but not necessarily where they are located. This is one of the important reasons for the manual assessment of a website. Providing a feature, but not in an accessible form or location, detracts from the usability of the website. Table 5-6 provides a ranked summary of the checklist results.

ID	Checklist	Rank
74430	18	1
24621	15	2
58711	15	2
62194	15	2
24242	15	2
75023	14	6
34259	13	7
21332	13	7
77184	13	7
56858	13	7
90916	13	7
59960	13	7
97613	12	13
22495	12	13
16883	12	13
25979	11	16
50149	11	16
36553	11	16
97502	11	16
15273	11	16
44844	10	21
86137	9	22
53815	9	22
32293	8	24
67682	8	24
38003	8	24
87917	7	27
93676	5	28
18672	4	29
Median	12	
Min	4	
Max	18	

Table 5-6 : Manual Checklist Summary

The implications for a library website scoring as low as website 18672 with a score of 4 out of 18, is that the website would be virtually useless for a user with visual impairments.   The website in question received marks for the features (5) Homepage lists key tasks, (7) It is easy to find general library information, (9) It is easy to find a catalogue link, and (10) It is easy to order an item. However it should be noted that this evaluation is from the perspective of a sighted user not requiring any assistive technology. There were no accessibility features, no 'contact us' link for assistance, no re-sizing, and no option to return to a home page.

5.1.1.4   JAWS Assessment

JAWS is a popular screen-reading software tool used by many visually disabled individuals (Freedom Scientific, 2010b). JAWS is a complex software application which requires training in order for the user to become proficient in the shortcuts and quick key features. According to Brophy (2007),

> It is an extremely complex (and expensive) piece of technology that requires initial training in its use if its potential is to be realized and may also require further training whenever a new version is released...success in using some of the more advanced features provided by screen reading technology was often dependent on awareness, training and experience.

Mankoff states "Learning to use a screen reader well enough to evaluate a web page with a monitor turned off required 20-40 hours practice." (Mankoff, Fait, & Tran, 2005) However, the time is considerably shortened, using the monitor turned on. For this assessment, tutorials provided by Freedom Scientific were completed, as well as assistance provided by a member of the Equity Disability and Diversity staff at Edith Cowan University.

JAWS is often used for expert evaluation of websites, for example in the study at the Queensland University of Technology, the researchers used a student and a staff member who had visual impairments and regularly used JAWS to provide feedback on their website accessibility (Borchert & Conkas, 2003).

While the above researchers state that the software is expensive, Freedom Scientific allows it to be used free for 40 minutes at a time, as often as desired. The download of the 40-minute version is updatable as future versions become available. This feature should be of financial benefit to libraries for the purpose of regularly testing their websites and removes part of the cost barrier to achieving accessibility and usability in websites.

Due to time constraints, it was decided to measure a sampling of the websites against the JAWS software. Three websites were chosen for the JAWS evaluation according to their relative ranking across the various audit tools used. The websites were chosen according to the best, mid-range and worst ranking in each category.

The analysis done here was performed in a similar manner to that indicated in the literature review. In Mankoff's study, they found that the best method was to "evaluate a site with the help of both a monitor and a screen reader, using an expert review method."(Mankoff, et al., 2005)

ID	Checklist		Sortsite Overall	Errors	Accessibility	FAE Nav/Orient		W3C HTML/XHTML errors	warnings		W3C CSS errors	
97613	12		9.24	1.41	0.43	7	f	4	0	f	8	Best
25979	11		18.39	3.47	8.52	30	f	21	0	f	5	Mid-range
15273	11		29.67	24.33	20.33	16	f	26	0	f	115	Worst
Statistics for this group												
	11	Median	18.39	3.47	8.52	16.00		21.00	0.00		8.00	
	11	Min	9.24	1.41	0.43	7		4	0		5	
	12	Max	29.67	24.33	20.33	30.00		26.00	0.00		115.00	
Statistics for entire 29 websites												
	12	Median	18.78	5.29	8.47	15.00		27.00	2.50		7.00	
	4	Min	8.05	0.94	0.43	7		2	0		0	
	18	Max	50.51	33.43	27.27	30		163	66		115	

Table 5-7: Best, mid-range, and worst website scores

The purpose of Table 5-7 is to illustrate the overall trend in the performance of the selected websites used for the JAWs analysis. As can be seen, library 97613 while not the best performing out of the websites in the checklist, scored in the upper third, and had among the lowest rates of errors in the other tools. Website 25979 had an average score in the checklist, and rated mid-range among the other tools, while library 15273 also had an average checklist score, while scoring in the worst performing group for the other tools.

The JAWS assessment involved starting at the council home page and counting both the elapsed time and number of clicks to request a book by a particular author. The purpose of this assessment was to determine how a patron with visual disabilities would be able to navigate the website using screen-reading assistive technology. The assessment was conducted manually, and then with JAWS to compare the results which is demonstrated in Table 5-8.

	Manual			Using JAWS	
Library ID	Time taken	# of clicks		Time Taken	# of clicks
97613	54.5 seconds	4		1:42 mins.	9
25979	23.6 seconds	4		Unable to access after 8 tries.	
15273	17.9 seconds	3		Unable to access after 5 tries.	

Table 5-8 : JAWS Assessment Results

Using JAWS to negotiate websites required training on the software to learn the quick keys and understand website navigation with a screen-reader. Before undertaking web-based training, it was found virtually impossible to navigate even the best website. Following training, it was still difficult to navigate web pages. This portion of the research demonstrated a number of problems faced by disabled users. The SortSite Accessibility evaluation highlighted 70 guidelines of WCAG 1.0 and 2.0 that were absent in at least one of the twenty-nine sites audited. The ones found most frustrating on the JAWS evaluation were:

- Provide a way to skip repeated navigational links
- No associated label for form content.
- Mark-up errors
- Incorrectly nested headings

The JAWS evaluation started with the highest ranking library (97613). After three attempts, the best time to complete the same task was almost twice that for a manual search for the same item. It was particularly difficult to access the drop-down box for the type of search (author, title etc.). It should be noted that the number of keystrokes required to perform the JAWS search was twice that for the manual search.

In the second JAWS evaluation, the middle-ranking library posed considerable problems when trying to order the same item. It was extremely quick in a manual search as the library is shown in the top ribbon on the council's site. However, using JAWS, the effort was abandoned after eight attempts as there is a hyperlink 'click here' embedded in the online catalogue link. JAWS reads this link as a long series of numbers, and no description. Unless the user knew this was the catalogue link, they would not be able to understand where the link took them. Also, in this website, you need to enter that same link to view your lending record or renew items.

Finally, the lowest ranking library in Table 5-8 was library 15273. This website enables a sighted user to access an item in the shortest time of the websites checked. This is partially due to the fact that it is not

linked to a council website as it is funded by more than one council. However, the research was unable to locate the item using JAWS alone as the links displayed do not contain useful descriptions, and there is no alternative text assigned to the 'library catalogue' button.

5.1.1.5   W3C Compliance

Checking a website for W3C compliance enables the reviewer to see many of the errors and problems that would be encountered by a user with visual impairments. It should be noted that sometimes a high number of W3C errors indicates a single problem occurring many times, or an error that has a cascading effect and can be easily fixed. This is further evidence of the need to use a multiplicity of tools when assessing websites for accessibility.

In order to check all websites against the W3C Best Practice Guidelines for coding validation, the researcher installed the Web Accessibility Toolbar (Vision Australia, 2010). This toolbar allows the user to validate a website against a number of methods including those of HTML/XHTML and CSS, the areas assessed for this research. Validating the W3C compatibility of a website was considered necessary for comparison with the other tools and for validation of the chosen tools as both SortSite and FAE tools include Standards assessments.

One of the problems encountered was that there were different HTML/XHTML levels used, from HTML 4.0 Transitional, to XHTML 1.0 Strict. According to the W3C assessment, all websites failed W3C validation, with the lowest error rate being 1 error, 0 warnings as XHTML 1.0 Strict, and the highest being 163 errors, 3 warnings as XHTML 1.0 Transitional. What should be noted here, as for the CSS, this is the total number of errors, which could mean 1 error occurring 163 times, or 163 errors occurring once. An example of a W3C HTML validation is provided in Figure 5-6.

Figure 5-6: W3C HTML validation example

In the CSS assessment, 3 libraries/library systems passed the validation. The maximum number of CSS errors was 115. An example of a W3C CSS validation appears in Figure 5-7.

W3C The W3C CSS Validation Service
W3C CSS Validator results for http://www.visionaustralia.org/ais/? (CSS level 2.1)

Jump to: Errors (20)   Validated CSS

W3C CSS Validator results for http://www.visionaustralia.org/ais/? (CSS level 2.1)

Sorry! We found the following errors (20)

URI : http://www.visionaustralia.org/styles/advanced.css

112	.supportusdonate	Value Error : height only 0 can be a length. You must put a unit after your number : 30 30
128	.supportusother	Value Error : height only 0 can be a length. You must put a unit after your number : 30 30
209	* html fieldset	Property scrollbar-face-color doesn't exist : #cce2bc #cce2bc
210	* html fieldset	Property scrollbar-shadow-color doesn't exist : #b1d296 #b1d296
211	* html fieldset	Property scrollbar-highlight-color doesn't exist : #e5f0dc #e5f0dc
212	* html fieldset	Property scrollbar-3dlight-color doesn't exist : #f0f7eb #f0f7eb
213	* html fieldset	Property scrollbar-darkshadow-color doesn't exist : #93c26c #93c26c
214	* html fieldset	Property scrollbar-track-color doesn't exist : #eff3ed #eff3ed
215	* html fieldset	Property scrollbar-arrow-color doesn't exist : #008000 #008000
219	* html textarea	Property scrollbar-face-color doesn't exist : #cce2bc #cce2bc
220	* html textarea	Property scrollbar-shadow-color doesn't exist : #b1d296 #b1d296
221	* html textarea	Property scrollbar-highlight-color doesn't exist : #e5f0dc #e5f0dc
222	* html textarea	Property scrollbar-3dlight-color doesn't exist : #f0f7eb #f0f7eb
223	* html textarea	Property scrollbar-darkshadow-color doesn't exist : #93c26c #93c26c
224	* html textarea	Property scrollbar-track-color doesn't exist : #eff3ed #eff3ed
225	* html textarea	Property scrollbar-arrow-color doesn't exist : #008000 #008000
957	.featureddate	Value Error : color darkred is not a color value : darkred darkred

URI : http://www.visionaustralia.org/styles/va_splash.css

108	ul#topnav li.carolscurrent	Value Error : background Too many values or values are not recognized : darkred darkred
121	ul#topnav a.carolsa	Value Error : background Too many values or values are not recognized : darkred darkred
605	#carolsheader	Property xborder-top doesn't exist : 1px solid #ddd 1px solid #ddd

Figure 5-7: W3C CSS validation example

The W3C HTML and CSS validation is provided in Table 5-9.

		W3C Validation					
		HTML/XHTML				CSS	
ID		errors	Warnings	Level		errors	
32293	f	96	0	HTML 4.01 Trans	f		4
25979	f	21	0	HTML 4.01 Trans	f		5
34259	f	101	3	XHTML 1.1	f		31
18672	f	149	2	HTML 4.01 Tran	f		24
24621	f	8	0	XHTML 1.0	f		17
87917	f	45	10	HTML 4.01 Trans	f		2
67682	f	5	0	XHTML 1.0 Trans	f		4
21332	f	80	0	XHTML Strict	f		5
77184	f	32	3	HTML 4.01 Trans	f		2
56858	f	27	9	XHTML 1.0 Strict	f		56
90916	f	20	0	XHTML 1.0 Trans	f		18
50149	f	41	5	XHTML 1.0 Strict	f		2
86137	f	84	66	XHTML 1.1	f		3
75023	f	14	1	XHTML 1.0 Trans.	f		1
93676	f	10	0	HTML 4.0 Trans.	p		0
74430	f	163	3	XHTML 1.0 Trans	f		4
53815	f	4	0	HTML 4.01 Strict	f		11
97613	f	4	0	XHTML 1.0 Trans	f		8
36553	f	118	52	HTML 4.01 Trans	f		69
22495	f	28	4	XHTML 1.0 Trans	f		5
58711	f	60	10	XHTML 1.0 Trans	f		7
59960	f	10		XHTML 1.0 Str.	p		0
97502	f	19	26	XHTML 1.0 Trans	f		2
15273	f	26	0	XHTML 1.0 Trans	f		115
62194	f	2	0	XHTML 1.1	f		9
24242	f	49	44	HTML 4.0 Trans	f		17
44844	f	18	10	XHTML 1.0 Trans	f		17
16883	f	39	10	HTML 4.01 Trans	f		8
38003	f	15	0	HTML 4.01 Trans	f		22
Median		27.00	2.50		Median		7.0
Min		2	0		Min		0
Max		163.00	66.00		Max		115.00

Table 5-9 : W3C Validation Summary

5.2   Surveys

In order to answer the supporting questions regarding willingness, barriers and conformance to website accessibility guidelines, two surveys were posted online – one for libraries that currently have their own website with links to an online catalogue, and one for libraries who do not currently have this type of website. It was presumed that libraries that do not yet have a website would eventually head in this direction, therefore in order to assist in answering the supporting questions of the research, it was considered beneficial to gain an understanding of the perceptions of website accessibility of this group.

In the first survey emails were sent to the 80 libraries with websites. In addition, a number of library administrators requested survey ID numbers as they were completing the surveys on behalf of their library group, and/or wanted to complete one in addition to the individual libraries within their group. A total of 43 surveys were started with 26 completed (60% of those who started the survey). The rate of 43 out of approximately 85 respondents was deemed very successful. A rate of twenty-six complete surveys out of a possible 85 was considered at least to have reached the point where results were able to be generalized.

In the following sections, which deal with the actual survey responses, some discussion is provided with each question followed by a more detailed analysis at the end of the chapter. Each of the surveys commences with a section on the demographics for the library, followed by questions regarding their websites, understanding of issues relating to website accessibility, website accessibility compliance and the importance and barriers encountered in this area. Both of the surveys are designed in a similar manner, with the survey for libraries currently without websites being of a more general nature, looking for perceptions of how the issue would affect any future website they may be planning.

A discussion of the comparison between the two survey results and their correlation with the website audit tools are provided at the end of this chapter, with an overall summary in Chapter 6.

5.2.1. Survey 1 – for libraries with websites.

The first survey was designed for libraries which currently have websites with on-line catalogue links, other than links to the State Library catalogue. As mentioned previously in the audit section, there are 29 different websites, a number of which service consortia of shire/city council libraries.

Section 1: Demographics

The initial 5 questions contain demographic information with the first question providing the identification number for anonymity. The demographic information is critical for the comparison of results. Information such as the size of the population served by the library/library system compared with the importance placed upon the website and the awareness of the need for website accessibility is provided in the discussion at the end of this chapter.

Question 1.1: Identification number supplied in the email

Each of the libraries identified in the Australian Libraries Gateway as having a website with an on-line catalogue was sent an email containing a link to the survey and an identification number to be inserted in this response space. The purpose was to maintain anonymity of the survey and is not used for statistical calculations.

Question 1.2: Area population served?

Responses to this question indicate that 84% of the libraries serve an area with a population of at least 10,000 people. Libraries serving larger populations are typically library consortia having a number of branches (up to a high of 6 branches in one system). This applies more typically to metropolitan libraries, but some rural shires which cover large areas also have a number of branches. There is a correlation between the awareness of larger library systems and their awareness of accessibility issues.

#	Answer		Response	%
1	1-999		0	0%
2	1000-4999		0	0%
3	5000-9999		6	15%
4	10000-49999		22	56%
5	50000+		11	28%
	Total		39	100%

Table 5-10 : Demographics-Population

Question 1.3: Number of staff working in the library/library system

Public libraries in Western Australia are operated by the various local government councils. Larger cities/councils may have up to six libraries within the council. Some rural and smaller metropolitan council governments operate libraries under a consortium to reduce costs. The survey indicating a staff of more than 100 is from one of the larger councils, as some of the surveys were completed by library

management on behalf of the entire city. Table 5-11 illustrates that 64% of the respondents indicate their library has less than 20 staff. Due to the difference in the responses to this question in survey 2, it would appear that libraries with less staff and which serve a smaller population are less likely to have a website. Interestingly, libraries with staff of less than 10 members were all uncertain as to whether they met any of the recognized guidelines, and while 92% of them saw the website as an integral part of their library services, and were almost completely unaware of the accessibility tools, except for a small number who were aware of JAWS. Members of this group expressed that time, cost and technological change were the chief difficulties in meeting website accessibility, but were largely uncertain as to what posed the barriers to achieving compliance.

#	Answer		Response	%
1	1-9		13	33%
2	10-19		12	31%
3	20-49		9	23%
4	50-99		4	10%
5	100+		1	3%
	Total		39	100%

Table 5-11 : Demographics - # of staff

Question 1.4: Size of collection (in items held)

The answers to this question indicate that 85% of the population held from 10,000 to 99,999 items. It can be noted from Table 5-12, that none of the respondents indicated a collection size of less than 10,000 items. This might be considered to be the point at which a library deems it appropriate to provide a website with an on-line catalogue, or at least in hindsight it would have been an interesting question to ask. There is also the possibility that the larger the collection size the more likely that patrons with disabilities would seek information resources, due to the greater likelihood of finding suitable materials within the collection.

#	Answer		Response	%
1	1-9999		0	0%
2	10000-49999		21	54%
3	50000-99999		12	31%
4	100000+		6	15%
	Total		39	100%

Table 5-12 : Demographics - Size of collection

Question 1.5: Patron population served by library

In this question, the respondents were asked to rank from one to five the age demographic of their library patrons. The variety of answers to this question reflects the diverse socio-economic conditions throughout Western Australia. Of the 38 respondents, 11 rated working adults first, 10 rated young

families first, and 9 rated children first. Comments attached suggest that most libraries find they have a range of all groups present in the libraries. This question is of consequence in website accessibility terms because of the Australian trend of aging population and the different needs that will emerge as this trend continues. A majority of respondents to this question chose 'other' as their last choice for this question and listed comments that suggested they had a range of all age groups in their library population. One respondent suggested that they had a significant ethnic population with both long-established and more recent arrivals. Another respondent listed young adults and non-working adults of significance in their patron population. Table 5-13 provides a breakdown of the responses to this question, while Table 5-14 provides the responses to the 'other' category. The respondent ranked 'retirees' as the first choice in their age demographic is the library chosen as the top-scoring library for the JAWS evaluation. A further discussion on their responses is included in at the end of this chapter.

#	Answer	1	2	3	4	5	Responses
1	Children	9	6	15	8	0	38
2	Young families	10	17	5	5	1	38
3	Working adults	11	7	10	10	0	38
4	Retirees	7	8	8	15	0	38
5	Other	1	0	0	0	37	38
	Total	38	38	38	38	38	-

Table 5-13 Age demographic of library population

Other
Adult 20-64yo; Junior 0-14yo; seniors 65+; YA 15-19yo
All ages
All groups fairly equally represented in library usage
all of the above
Non working adults
Range of all the above
Significant ethnic populations both long established and more recent arrivals
Young Adult

Table 5-14: Responses to 'Other' in Table 5-13

Question 1.6: Asks whether the library had a standalone website or was part of the local council.

Of the 39 respondents, 85% said their library website was part of the local council. This clearly indicates the current trend for libraries to be linked to their sponsoring body's website. This is also of interest in light of the new Australian Government website accessibility guidelines outlined previously. Libraries linked to the sponsoring council's website have ".wa.gov.au" in their URL, clearly indicating the need to comply with government legislation which uses this as one of the methods for determining whether a website is a government website and thereby falling under the legislative guidelines.(Australian Government Information Management Office (AGIMO), 2010b)

#	Answer		Response	%
1	Standalone website with on-line catalogue		6	15%
2	Part of the local council website, but has an on-line catalogue link		33	85%
	Total		39	100%

Table 5-15: Website description

Section 2: Website Information

The following questions deal with the actual library website and both how the staff and their patrons perceive its importance and the amount it is used. These questions reflect the attitudes people have towards the need to make sure the website is both accessible and usable by the entire population served by the library.

Question 2.1: Management of the library website

As illustrated by Table 5-16, these responses were quite mixed. Regarding library management, 25 out of 38 responded that they agree to some extent that their library is managed by the local council's I.T. Department, while 26 out of 38 agreed that their library website was managed by a dedicated library I.T. staff member. 35 out of 38 agreed that their library contained an online catalogue as well as library community information, and only 1 library stated that their library website contained a purely on-line catalogue. This indicates the variety of styles of website management within Western Australian public libraries. The Likert scale used in this and subsequent questions requested that respondents place their answer in a range of 1 to 5 with 1 being strongly agree, to 5 being uncertain.

#	Question	SA	A	D	SD	U	Responses
1	a) Our library website is managed by our local council's I.T. dept	5	20	6	5	2	38
2	b) Our library website is managed by a dedicated library I.T. staff member	6	20	6	6	0	38
3	c) Our library website contains an on-line catalogue as well as library community information.	14	21	3	0	0	38
4	d) Our library website contains an on-line catalogue only.	0	1	8	29	0	38

Table 5-16: Library website management

Question 2.2: Further issues relating to websites

When provided with an opportunity to address any issues they felt pertinent to their websites, there were 24 responses, of which 6 were identical. This would indicate that these six comments were from a library group and had assistance completing at least part of the survey, further verified by the identical typographic error in each answer. The variety of responses indicated various stages in website development and management, including additional features and technologies employed in their websites. Most comments indicate some discussion as to who writes the content compared with who approves it and who posts it on the website.

The responses to this question present an interesting comparison to question 2.2 which asks for the barriers posed to website accessibility. In the response to that question, respondents strongly lean towards disagreement with the question regarding council's support and input into library website being barriers to implementing accessibility compliance. There were 24 textual responses to this question, the large number of which suggest some frustration as to who is responsible for website content. Table 5-17 includes a representative selection of the responses. In this and subsequent text entry questions, answers are presented as they were received, including any grammatical and typographical errors.

These responses indicate a level of frustration regarding library website input. In particular, library 50149 provides a good insight into the problems faced by libraries in controlling the content of the library website.

The free-text responses to this question where there are six identical answers initially posed a concern. These are from one library group, where it would appear the respondents have either assisted each other in providing accurate responses, or been provided with the material to enter. Due to a concern that this might misconstrue the results, a subgroup was created to compare the other responses from these six libraries. This analysis showed differences in responses across most questions, with some similarities in the textual responses, however there were some exceptions in this area as well. It is therefore assumed that there was discussion among the respondents in this group as to appropriate comments to insert in the textual responses only but that the rest of the responses were done on an individual basis.

The disparity between the responses in this question and in question 2.2 are partially answered by the websites participating in surveys. Apparently when questioned about 'council support', they understood the question to mean the elected officials (Councilors), not the administrative staff. This explains why there appears to be some tension between the libraries and other departments which is not echoed in the question as to whether council support is a barrier to achieving website accessibility.

The general impression left by the responses to this question in Table 5-17 is that library staff often feel that they do not have much control over the content of their website and that there are difficult time delays faced due to the need to pass material through various departments. There is also a feeling of the abilities of library staff not being fully utilized.

Text Response
Library 16883 "The Town's website (and therefore Library webpage) is about to undergo a long overdue revamp. To-date the Library has been unable to progress major changes to its webpages due to the uncertainty regarding the future of the Town's website. This has been incredibly frustrating as the Library Service staff have the skills and knowledge to progress, but have been hampered by the Town's slow progress."
Library 37750 "As manager of the library service I create and manage all aspects of the library website and online catalogue. I am NOT a library IT staff member"
Library 50149 "Our library website is managed by one council communications officer who is responsible for managing the whole of the council's website as well as the library website. This makes it difficult for us to update the website quickly, as any change to the website, even fixing broken links, must be first approved by the library manager, communications officer, communications manager and department manager. The communications department has strict rules and regulations regarding writing style, preferring a formal tone rather than a friendly one, which I don't feel is appropriate for a library website. The design, layout and use of images is also heavily restricted. Although the council's website was reviewed and updated only this year, the design and layout was outsourced to a website design company, and as I understand it any changes to the design would attract additional costs. So as much as I would love to integrate web 2.0 technologies into our website, and make it more user-friendly, innovative and interactive, I feel that my training as a librarian in library website design is not being fully utilised or even recognised by my local council."
Library 82367 "The library website is maintained by the council's communications department, and all content must be approved by them and conform to their writing standards. We have no input into library website design or accessibility, and our opinions and suggestions regarding the library website are not implemented."
Library 28719 "We are sometimes restricted in what we can include on the website by policies or capabilites of Marketing and IT departments."
Library 41414 "All professional staff contribute to aspects of our website and major changes are made with the assistance of the council's ICT department - it is very much a joint effort."
Library 44844 "Corporate website does not always best meet library needs. IT security issues affect access to areas such as catalogue."
6 library responses "Council IT Dept. manages hardware; Library e-Services coordinator manages & inputs content; Council Corporate Communication Dept. dicatate structure and oversees content conformity. Library website contains link to on-line catalogue website."
Library 62194 "It would be better to have a more prominent library page and link or address. It would be better to to be able to up[date our pages from ibrary staff. At this stage notifications are sent to the Communications manager who then subm,its to an external website perosn to upload."
Library 20801 "we are to follow strict guidelines as to what out library website looks like. This relates to font size, type and colour, picture size, heading types and means the appearance of our website is quite restricted. Content is a bit more flexible. Also, the time it takes for content to go 'live' can be a problem as it has to go through another department (Marketing) first."
Library 56858 "Our website is joint mainteained by a library staff membe and Council IT, The final say is not within the library's control. Our website has links to many other library resources, but the community information service is linked to Google Maps, and is not a library controlled service."

Table 5-17 Additional issues relating to websites

Question 2.3: How heavily the library website is utilized

Table 5-18 demonstrates that most respondents felt the library's website was heavily utilised. This response correlates strongly with the responses to question 2.4 regarding the awareness of patrons of the on-line catalogue and question 2.5 which discusses the library staff view the importance of the website. As indicated in question 2.5, 92% of the respondents felt that the website is "an integral part of our library services", and in question 2.4, 61% of the library population was aware of the catalogue and used it regularly.

#	Answer		Response	%
1	Heavily utilised		29	76%
2	Lightly utilised		6	16%
3	Do not know		3	8%
	Total		38	100%

Table 5-18: Utilisation of website

A cross-tabulation of question 2.1 which relates to the area population with question 2.3 dealing with the utilisation of the website showed that only libraries with area populations of more than 5000 responded to the question of website usage, with libraries in the 10,000 to 49,999 range expressing the higher proportion of heavy usage of their websites.

The libraries who responded 'do not know' are unrelated websites, two with populations in the 10,000 – 49,999 range, and one with greater than 50,000. Staff numbers include 1-9, 10-19, and 50-99 respectively. It is therefore interesting in view of the focus of this research to question why a library with such a large staff would not know how heavily their website is used. As most of the larger websites are used by multi-branch library systems, the 'do not know' option may be due to the fact that in the larger systems, the branch librarian may not be as aware as the library or I.T. management of the total usage of the library website.

Question 2.4: Patron awareness of the on-line catalogue

This response indicates that all of the patrons are aware of the catalogue. The response indicates that library staff feels the majority of the patrons (61%) use the on-line catalogue regularly. None of the libraries felt their patrons were unaware of the on-line catalogue.

| #	Answer		Response	%
1	Aware of the on-line catalogue		15	39%
2	Aware of the on-line catalogue and use it regularly		23	61%
3	Largely unaware of the on-line catalogue		0	0%
	Total		38	100%

Table 5-19: Awareness of the on-line catalogue

Question 2.5: How the library staff sees the library website

While most staff (92%) see the library website as an integral part of the library services, only 8% saw it as an 'optional extra' , and no respondent viewed it as unnecessary. The responses to this question are validated by the responses to 2.3 and 2.4 previously. In survey 2, it is interesting that there were responses to options 3 and 4 of this same question. It is possible that libraries that do not yet have a website are not yet comfortable with the technology, or aware of the advantages to their patrons.

Of particular interest are the three respondents to this question who viewed the library website as an 'optional extra'. In light of the focus of the research, cross tabulation was conducted between this response with questions relating to library size, staffing, awareness of the website and usage. The responses indicate these three respondents come from three different population sizes including 50,000+, and varying staff sizes. Two of the three state that patrons are aware of the catalogue and one that patrons are aware of it and use it regularly. All three support the importance of web accessibility. However, while one respondent felt the website was heavily utilized, the other two felt it was lightly utilized. This last discrepancy may account at least partially for their answers to this question

#	Answer		Response	%
1	An integral part of our library services		35	92%
2	An 'optional extra' to our in-library services		3	8%
3	A necessary evil		0	0%
4	Unnecessary		0	0%
	Total		38	100%

Table 5-20: Staff views of website

Section 3: Website Accessibility Issues

Questions in the following section deal with issues of website accessibility. Issues such as perceived barriers, importance of adherence to standard, and ability to adhere to these standards are addressed. The responses to these questions address the issues raised by the supporting questions:

- Is there a willingness to conform to the guidelines?
- What are the barriers to public libraries in conforming to the guidelines?

Question 3.1: Awareness of website accessibility requirements

The following multi-part question deals with website accessibility standards and the degree of understanding respondents have of the need for compliance with these standards.

It is particularly important to note in Table 5-21, that nine respondents agree that they have not begun to check their websites for accessibility; five disagree and state they have begun to check, and 18 are uncertain. This is particularly significant percentage (56% of respondents), particularly due to the responses indicated in #1 where 81% of respondents were aware of the requirements in Australia for website accessibility. In that question, only one respondent was unaware, while five stated they were

uncertain if they were aware of the requirements. It is unusual for five people to state they are "uncertain if they are aware of the requirements".

Interestingly, one respondent 'strongly disagrees' to all of the first six statements, is uncertain about adherence (questions 7,8 and 9), agrees they have not begun to check (question 10), is uncertain about questions 12,13,14 and 15, and disagrees with question 16 regarding the priority for in-branch patrons accessibility. This respondent is from a shire with a single library having a patron population in the 10,000 to 49,999 range and staff in the 1-9 range. This same respondent feels their website is 'lightly utilised'. Of interest also, is while this respondent answered 'uncertain' to all of the questions regarding possible barriers to website accessibility compliance, they strongly disagree in this question that the legislation applies to library websites.

Further analysis of the Table 5-21 reveals that 81% of the respondents were aware of the requirements in Australia for website accessibility, and 81% felt that the Australian Human Rights Commission stance applied to libraries. 84% felt the *Disability Discrimination Act (1991)* applied to libraries, while 75% disagreed that libraries were exempt from the above legislation. There was a greater degree of uncertainty regarding the WCAG Guidelines, with 50% agreeing, and being 44% uncertain that local government bodies recognized the WCAG Guidelines. However, 81% felt they understand website accessibility, but 88% were not sure if their library website complied with WCAG 1.0., WCAG 2.0 or either of these. Of the respondents, 28% said they had not begun to check their website for accessibility, while 56% were unsure. 19% were in the process of checking their website, while 66% were unsure whether they had begun this process. Unfortunately, 63% were unsure if there were any plans to check the website. 9% felt there was no necessity to comply with guidelines, 66% disagreed, and 25% were unsure. Only 16% had requested their sponsoring body to amend the website to ensure its conformity, while 63% were unsure whether this had been done. The results were mixed as to whether amendment of the website was out of its control, with 44% agreeing, 44% disagreeing, and 13% being uncertain. It is interesting to note that where is great uncertainty regarding the state of website compliance for their libraries, only 16% felt that services for in-library patrons was more of a priority than those for website patrons, while 81% felt this was not the case.

#	Question	SA	A	D	SD	U	Responses
1	a) We are aware of the requirements in Australia for website accessibility	10	16	0	1	5	32
2	b) The Australian Human Rights Commission stance on equal access applies to library websites.	8	18	0	1	5	32
3	c) The Disability Discrimination Act (1991) applies to libraries	13	14	0	1	4	32
4	d) Libraries are exempt from the provisions of the above legislation.	0	1	9	15	7	32
5	e) Local government bodies recognize the WCAG guidelines.	2	14	1	1	14	32
6	f) We understand website accessibility as it applies to our library website.	9	15	2	1	5	32
7	g) Our library website adheres to the WCAG Version 1.0.	1	1	2	0	28	32
8	h) Our library website adheres to the WCAG Version 2.0	1	1	2	0	28	32
9	i) Our library website does not yet adhere to either of the above guidelines.	0	1	2	1	28	32
10	j) We have not begun to check our website for accessibility.	1	8	4	1	18	32
11	k) We are in the process of checking our website for accessibility.	0	6	2	3	21	32
12	l) We have no plans to check our website for accessibility.	0	1	5	6	20	32
13	m) We do not believe that there is a necessity for our library website to comply with these guidelines.	1	2	9	12	8	32
14	n) We have requested our sponsoring body to amend our website so that it conforms to the WCAG.	2	3	4	3	20	32
15	o) Amendment of our website is out of our control.	1	13	7	7	4	32
16	p) Services for in-library patrons are more of a priority than those for website patrons.	1	4	14	12	1	32

Table 5-21: Awareness of guidelines

Question 3.2: Additional comments regarding website accessibility

The term 'WCAG' was used deliberately as it is the commonly-used acronym for 'Web Content Advisory Guidelines', which as mentioned in the literature review is the international and Australian-accepted standard. It is quite indicative that people did not already know what WCAG represented. The text responses from 2 large libraries (population of 10,000 to 49,999) illustrate the lack of understanding of these guidelines and their applicability to library websites. One of these libraries indicates that their website is managed by the council's I.T. Department which may account for the lack of knowledge of these guidelines. However the other library (12449) respondent indicates they are the manager of the library service and create and manage all aspects of the website and online catalogue (question 2.2 above).

Text Response
Library 37750 "Maybe a survey design fault but on this page I suddenly see the acronym WCAG and don't know what it stands for so cannot answer the questions other than to say Uncertain."
Library 11984 "Time is a factor in updating as well as having the expertise" ·
Library 12449 "If you are going to use acronyms please describe what they are. Some of the questions are hard to answer using the scale provided."
4 library responses "The City's website, which includes the Library's website, is relatively new; testing is ongoing. Regarding (o) - the Library's can suggest amendments but have no control over implementation."
Library 84028 "Changes can be suggested but not always implemented."
Library 5542 "I believe the IT department and the providers of the CMS system for the council's website ensure the conformity to accessibility standards."

Table 5-22: Other comments regarding website accessibility issues

Section 4 Technical Issues

This next Section of questions deals with whether libraries perceive they have the ability to assess their websites, whether they perceive they are in need of assessment, and how aware the respondents are of available tools.

Question 4.1: Perceived ability to ensure website meets requirements:

This question reveals that 57% of the respondents believe they have the technical expertise to audit their websites, while 57% are unsure if they require assessment beyond the ability of in-house staff. Of the 30 respondents, 40% have not audited their websites to meet compliance, while 53% are unsure if this has been completed. Of particular concern is that 93% of respondents either disagree or are uncertain as to whether website has been audited and meets requirements. This is of particular concern with the National Transition Strategy cited previously.

Interestingly, one respondent answered that they believed their website had been audited and met all requirements. This response was from library 6752, which when checking the audit results is not the case. However it should be noted that this library was the only library to score 18 out of 18 on the manual checklist, indicating they have made considerable progress towards making their website usable. As noted in Chapter 5, automated checking tools should never used in isolation as they do not provide the full picture. In this case, the W3C compliance checking shows numerous errors of one type which will be easily remedied. This is partially due to a department entering material through the CMS without complying with the accessibility checklist provided for adding content.

#	Question	SA	A	D	SD	U	Responses
1	a) We have the in-house technical expertise to ensure our website meets requirements.	4	13	3	0	10	30 .
2	b) Our website requires technical assessment not currently available in-house.	0	5	6	2	17	30
3	c) We have audited our website and believe that it meets all requirements.	0	1	12	1	16	30

Table 5-23: Technical expertise

Question 4.2: Awareness of web, accessibility and usability tools:

This question asked whether the respondents were familiar with the following website accessibility tools. The results are not surprising, considering the degree of uncertainty expressed in question 4.1 above. Of the respondents, 3% were aware of TruWex, 0 were aware of SortSite, 3% were aware of FAE. A larger percentage, 27% were aware of the W3C online compliance tools, however this not reflected in lack of W3C compliance tested in the website audit section.

The respondent (49548), which indicated they were familiar with TruWex, FAE and W3C was from one of the largest libraries with the largest staff numbers. This respondent also believed that "there is a minority of people who benefit from website accessibility standards", while also believing that they understand and support the importance of website accessibility and that it is both achievable and necessary. This was also one of the only respondents which believed the most important benefit to website accessibility conformance was the "increased council reputation with community and other councils", and also believes their website is lightly utilised. They also strongly agreed that all eight of the listed barriers were a problem with achieving website accessibility compliance, and were one of the respondents to answer that they view their website as an 'optional extra' to in-library services. It is interesting to note the understanding of the respondent of the issues and tools available, and their stating that they support the standards, while still viewing their website as an 'optional extra', and not believing their website was well utilised.

Respondents who were familiar with the JAWS tool were also the most familiar with the other tools. This question did not ask whether they regularly used JAWS, but whether they were aware of it. It is noteworthy, that being aware of a tool does not necessarily mean that the library uses it to check their website. In the JAWS evaluation section, only the library 97613 was successfully navigated with this tool. This respondent stated they were uncertain as to whether their website had been checked for accessibility but expressed support for the need for accessibility. They were unaware as to whether their website would meet the guidelines. They were unaware of TruWex, SortSite or FAE, but somewhat aware of the other tools. This respondent disagreed that only a minority of people benefitted from the standards, but were uncertain as to whether they understood the importance, achievability or necessity for total website accessibility compliance. It is interesting that this respondent feels the issue of website accessibility needs further investigation, while scoring among the highest of the website tested, and being the only website successfully navigated with screen-reading software

Navigating a website with screen-reading software such as JAWS enables the developer to understand what the person with visual impairments receives from the site. Many people with visual impairments use screen-reading software, but are unable to judge the website's accessibility accurately, as they often do not know they are missing content. However, they are able to judge how well or poorly they are able to perform tasks, such as requesting a book such as in this evaluation.

#	Question	SA	A	D	SD	U	Responses
1	a) TruWex.	0	1	14	6	9	30
2	b) SortSite.	0	0	15	6	9	30
3	c) Functional Accessibility Evaluator (FAE).	0	1	14	6	9	30
4	d) W3C Online Compliance Check.	3	5	10	6	6	30
5	e) Jaws screen reader.	3	8	7	5	7	30
6	f) Web Accessibility Toolbar.	1	7	10	6	6	30
7	g) HTML 5	1	7	10	6	6	30

Table 5-24 Awareness of accessibility tools

Question 4.3: Other technical issues

This question requested that respondents list any other pertinent technical issues regarding website accessibility. Once again, the responses indicate there are issues relating to who updates the websites and is responsible for content and technical implications.

Text Response
Library 18672 "Have no input into the technical issues"
Library 28719 "Generally, technical aspects of our website are the responsibility of our Online servcies Librarian "and IT staff, not at the branch level.
Library 44844 "These questions should be aimed at technical staff rather than managers."

Table 5-25: Other technical issues

Section 5 – Other Issues

Question 5.1 - Barriers to website accessibility

This question required respondents to rank the barriers they perceived to achieving website accessibility. An interesting response to this question is that in five of the eight statements, the majority of respondents were uncertain as shown in Table 5-26. This response is upheld by the response to the following question on ability to meet website compliance. Of note in these responses, 13% of respondents indicate that cost is a barrier, 27% indicate technical ability is a barrier, and 20% indicate council support is a barrier. There were 20% of respondents who indicated they find that lack of input into the website for accessibility issues is a problem, and 30% felt that due to the management of the website by other departments that meeting accessibility was difficult. Of interest, 47% felt that website compliance was a priority with their council, contrasting with 53% who were uncertain as to whether it was a priority with the council. This confusion as to whether it was a priority is shown in the levels of frustration experienced in various textual responses in earlier questions. The follow-up interviews may have added some clarity to this confusion. It was pointed out in one of the interviews that the views expressed by the council, being the elected representatives, are not always those of the salaried administration staff. The administration staff is responsible for spending the available council funds, maintaining a balance between elected official interests, and administrative necessities. The low percentage of complaints received may either be due to patrons not knowing how accessibility should be provided, not wanting to complain, or of staff being unaware of any complaints made. In the

interviews, it was apparent that there was little awareness of whether people had complained, or how those complaints if any, had been resolved. Interestingly, 53% of respondents were uncertain whether constant technological change made ongoing compliance difficult.

#	Question	SA	A	D	SD	U	Responses
1	a) Cost is a barrier to achieving website accessibility compliance.	2	2	7	2	17	30
2	b) Technical ability is a barrier to achieving website accessibility compliance	1	7	10	1	11	30
3	c) Council support is a barrier to achieving website accessibility compliance.	2	4	5	3	16	30
4	d) We do not have sufficient input into the library website content to ensure accessibility issues are met.	2	4	11	7	6	30
5	e) Other departments manage the council's website which makes meeting accessibility requirements difficult.	3	6	14	1	6	30
6	f) Website accessibility is a priority with our council.	8	6	0	0	16	30
7	g) We have received complaints from patrons regarding the accessibility of our website.	1	3	12	6	8	30
8	h) Constant technological change makes ongoing compliance too difficult.	1	3	7	3	16	30

Table 5-26: Perceived barriers to website accessibility

Question 5.2 – Perceived difficulties in meeting website accessibility requirements

In this question, the respondents were asked to place the six items in order of which they felt were the major barriers faced by their library/library system in implementing website accessibility. The majority of respondents to this question placed cost or time as the most critical issues. While 21 of the 25 respondents listed 'other' as their last choice, the four who listed it as the first choice all cited 'technological change' as their reason.

#	Answer	1	2	3	4	5	6	Responses
1	cost	6	7	9	2	1	0	25
2	time	11	8	4	1	1	0	25
3	technical ability	1	6	7	3	7	1	25
4	council support	0	2	2	9	9	3	25
5	input into library website	3	2	3	10	7	0	25
6	Other (please specify)	4	0	0	0	0	21	25
	Total	25	25	25	25	25	25	-

Table 5-27: Difficulties in compliance

Question 5.3: Disability access for in-library patrons

This question looks at the level of provision made in-branch for library patrons and allowed a free-text response shown in Table 5-28. The respondents to this question appear to indicate they have made some attempts at accessibility for their in-library patrons with a variety of strategies indicated.

Library 37750 "Pro Reader has been installed but this can be used both inside the library and externally."

Library 18672 "In the process of investigating "ZoomText""

Library 21332 "Kurtweil Reader, StarViewer - enlarges text from letters, newspapers etc. Large keyboard and trackball."

Library 11984 "We have recently added Zoomtext to one of our computers for people with vision impairment"

Library 53815 "tackball mice; wheelchair accessible; Pcs adjustable for vision impairment"

Library 41414 "Aside from the items in our collection that are available for people with vision and hearing disabilities we also offer a delivery service to users who cannot, be it temporarily or permanently, travel to the Library themselves. It is also ensured that there is full wheelchair access to shelves, toilets and the front counter. The Library is equipped with disabled toilets for both men and women and we have good access from disabled parking bays and automatic front doors to enable full access to the building."

Library 44844 "Large monitors, increased font size, seated as well as standing access, wheelchair access."

Library 59960 "Currently reviewing disability access"

Library 39531 "large print books; books in audio format (CD, MP3 & media-players); CC and AD DVDs identified separately within the on-line catalogue website; magnifying sheets; automatic doors; wheelchair access; height adjustable furniture."

Library 5542 "All branches stock large print items as well as audio books. All branches are also wheelchair accessible."

Library 57951 "Larger font displays on public PCs for patrons with special needs."

Table 5-28: In-branch disability access

Question 5.4: Other issues affecting website accessibility (text entry)

In the following responses, it is evident that libraries 5542 and 6752 are aware of the issues regarding accessibility, but from different perspectives. These two respondents are from the same library group and were both present at one of the interviews. It is very evident, particularly from the response of 6752, that they are making a strong attempt to ensure their website is accessible. This group is once again, the group with the highest manual checklist score, again giving evidence to their dedication to the issue of website accessibility. The comments from library 6752 regarding the Content Management System (CMS) were further clarified in the interview as it became evident that some of their high rate of W3C errors was occurring because of input from particular users into the CMS. Many of the W3C errors are of one particular variety, which should be quickly remedied.

3 library responses "The structure of the Library's website is dictated by the City."

Library 5542 "Website accessibility is in the hands pf the IT department as I only manage the actual content in the CMS."

Library 6752 "We have tried to conform as far as possible to W3C and WCAG 2, to include skip navigation link, alt attribute for images, title attribute for links, not using tables for layout, and making the layout semantic, minimising the use of javascript, it is used for enhancement and everything is available without using it, not using images for text. trying to keep our images small and page sizes small so it's quick to download, using H1, H2 etc tags for headings, rather than bold, using summary and defining table headers etc properly. However, education and ensuring people use the accessibility features available in our Content Management System properly, is going to be the difficulty we face. We have an inbuilt accessibility checker within our CMS, for users to check their content conforms, we also have training for the CMS which will include why they should use the accessibility features within the CMS. We need to do independent tests on our whole site, and that is the next stage for us, to see where regular issues are occuring. Also we will continue to enhance the site including accessibility enhancements e.g. tab orders, and shortcut keys."

Table 5-29: Other issues affecting website accessibility

Section 6 – Benefits of Website Accessibility

The purpose of this section is to answer the third of the supporting questions: "What are the benefits of conformance?" The three questions in this section were designed to see if people understood who stood to benefit from website accessibility compliance. The literature review in the earlier part of this research discusses the fact that the more accessible a website, the more usable it is for everyone. There is also a good business case for having a website accessible, beside that of avoiding legal costs. The literature points out that when a website meets accessibility guidelines, it moves up in the search engine hits, therefore is more visible to patrons and other interested parties. This should be of particular interest as the majority of library websites are attached to local government council websites, who have a vested interest in promoting their region.

Question 6.1 – Importance of website accessibility

Table 5-30 demonstrates that library staff understands the importance of website accessibility (82%). Respondents believe that total website accessibility is achievable (61%) and that total website accessibility is necessary (68%).

#	Question	SA	A	D	SD	U	Responses
1	a) We believe that there is a minority of people who benefit from website accessibility standards	2	6	5	9	6	28
2	b) We understand and support the importance of website accessibility.	12	11	0	0	5	28
3	c) Total website accessibility compliance is achievable.	3	14	1	0	10	28
4	d) Total website accessibility compliance is necessary.	3	16	0	0	9	28

Table 5-30: Importance of website accessibility

Question 6.2 – *Ranking of benefits of website accessibility conformance*

Table 5-31 demonstrates that the vast majority of libraries believe the most important benefit is that of assisting the disabled within their community (76%), followed by general user satisfaction with the website. This is supported by free-text comments on the next question, and further by the responses to the same question in the second survey. It is interesting that only one library placed the council's reputation first in this ranking, which as mentioned previously is one of the respondents who felt that the website was an 'optional extra' and not heavily utilised. The fact that 15 of the libraries placed little importance on the 'reduction in possible litigation' last in importance, may indicate that few libraries understand the level of costs that may be incurred if a complaint was made to the Australian Human Rights Commission. Few libraries agreed that an improvement in website accessibility would result in an improvement in search engine results which points back to understanding of website accessibility issues.

#	Answer	1	2	3	4	5	Responses
1	Increased council reputation with community and other councils	3	1	9	11	1	25
2	Assisting disabled community members	19	6	0	0	0	25
3	Improvement in search engine 'hits' for our website	1	0	9	9	6	25
4	Reduction in possible litigation	0	5	1	4	15	25
5	General user satisfaction with website	2	13	6	1	3	25
	Total	25	25	25	25	25	-

Table 5-31: Ranking of benefits of website accessibility conformance

Question 6.3: *Perception of other benefits to website accessibility (text)*

The response from library 5542 reiterates the level of commitment to the issue of website accessibility referred to in question 5.4 above. All of the respondents to this question understand the universal benefits of website accessibility, even though at this point they have not yet fully arrived at that point.

Text Response
Library 41414 "Improved website accessibility would certainly benefit all users, which is why our website has remained very simple in its design."
3 libraries "Ability to encompass all the community."
Library 62117 "Access for all."
Library 5542 "Having a high level of website accessibility ensures that we can service the maximum number of patrons and visitors."

Table 5-32: Perception of other benefits to website accessibility

Section 7: Conclusion

The concluding four questions asked whether further investigation was required and whether the respondent would be willing to participate in an interview, if so, providing contact details.

Question 7.1 - Do you feel the issue of website accessibility requires further investigation

It is not surprising, that the majority of respondents felt further investigation was required into the issue of website accessibility, in view of the uncertainty expressed in earlier questions. What is surprising, is that 23% of respondents did not feel further investigation was required. It might be that they feel the matter is well-understood, or that they are unaware of the importance of the issue and the implications for their libraries and councils.

#	Answer		Response	%
1	Yes		20	77%
2	No		6	23%
	Total		26	100%

Table 5-33: Investigation required

Question 7.2 Other issues

The responses shown below are from the same libraries as in questions 5.4 and 6.3 above, and add further credence to their desire to meet the established guidelines.

Text Response
Library 5542 "Our CMS provider claims to be up to date with most standards so it would be interesting to see how our system rates."
Library 6752 "It requires constant investigation and research as community needs and technology changes."

Table 5-34: Other issues regarding the survey or websites

Question 7.3 – Willingness to participate in an interview

It was surprising that only 27% of respondents indicated a willingness to participate in an interview. The email originally sent, and the follow-up stated that information regarding their website's audit would be provided at the interview. There were two interviews conducted as most of these respondents were from two large metropolitan library groups. A further interview is planned for a later date and it is hoped that future interviews may provide more information as well as allow the distribution of the website audits results.

#	Answer		Response	%
1	Yes		7	27%
2	No		19	73%
	Total		26	100%

Table 5-35: Willingness to participate in an interview

5.2.2. Survey #2 – Survey for libraries without websites

This second survey was sent to libraries without websites, on the assumption that many, if not most, libraries would eventually be linked to a website and an on-line catalogue. For the purpose of this research, it was deemed to be advantageous to gain the perceptions of these libraries of the issue of website accessibility. Of the 232 Western Australian public libraries identified by the Australian Libraries Gateways, 152 were identified as not having websites with on-line catalogues. A number of these had either missing or incorrect email addresses. Therefore, approximately 100 public libraries were invited to complete the survey. A second email was sent, the result being that 17 surveys were started, with 11 completed; a result of approximately 17% of libraries receiving the survey link completed at least part of the survey. The results are provided below.

The survey followed a similar format to the survey for libraries with websites containing on-line catalogues, with the questions divided into Sections beginning with demographic information. Those questions from Survey 1 which were deemed irrelevant for this group were removed, and libraries were not requested to provide an identification number as interviews were not planned for this group.

Section 1: Library Information

Question 1.1: Area population served by the library/library system

From Table 5-36, it would appear that the majority of the respondents served an area population of less than 1000. The one response from a library serving greater than 50,000 people would be an anomaly. This respondent further indicated they have an extensive library website – indicating the information in the Australian Libraries Gateway was incorrect in this instance. In survey 1, 56% of respondents showed a population of 10,000 to 49,999, and 28% showed a population in excess of 50,000. The smaller population size in survey 2 may relate to their ability to develop and host a website due to a proportionately lower income threshold for the sponsoring body, and also less available staff to manage such a website.

| #	Answer		Response	%
1	1-999		7	41%
2	1000-4999		2	12%
3	5000-9999		2	12%
4	10000-49999		5	29%
5	50000+		1	6%
	Total		17	100%

Table 5-36: Area population

Question 1.2: Staff working in the system

In a similar manner to question 1.1, the libraries in this group employed significantly less staff, again possibly contributing to their lack of a website, or their perceived need for one.

#	Answer		Response	%
1	1-9		15	88%
2	10-19		1	6%
3	20-49		1	6%
4	50-99		0	0%
5	100+		0	0%
	Total		17	100%

Table 5-37: Number of staff

Question 1.3: Size of collection

The size of the collection for libraries in survey 2 is also significantly smaller than those responding to survey 1. In the first survey, 85% of respondents had a collection of between 10,000 and 99,000. While in survey 2, 88% of respondents had a collection of between 1 and 49,999, with 47% having a collection of less than 10,000.

#	Answer		Response	%
1	1-9999		8	47%
2	10000-49999		7	41%
3	50000-99999		1	6%
4	100000+		1	6%
	Total		17	100%

Table 5-38: Collection size

Question 1.4: Patron Population

The patron population demographic between the two groups showed a definite difference. In survey 1, the respondents ranked working adults (29%), young families (26%), children (24%), and retirees (31%) as their largest groups (indicated by choosing that option as first choice).   In survey 2, the ranking showed young families (38%), retirees (31%), working adults (25%), and children (6%).

It can be surmised from the library population, staff size and collection size, that the larger libraries are more likely to have a website with a dedicated on-line catalogues, and also show they have a larger proportion of working adults, less children, and slightly less retirees.

#	Answer	1	2	3	4	5	Responses
1	Children	1	5	6	4	0	16
2	Young families	6	5	3	2	0	16
3	Working adults	4	3	3	6	0	16
4	Retirees	5	3	4	4	0	16
5	Other	0	0	0	0	16	16
	Total	16	16	16	16	16	-

Table 5-39: Patron population

Question 1.5: Description of future website

It would appear that while the majority of respondents felt that their future website would be set up in the standard manner of the respondents in survey 1, a significant number are uncertain as to how their website would work. In survey 1, 85% of libraries state that their website is part of the local council website which shows a strong correlation to this response. Interestingly, only 12% feel they would have control of their own website which relates very closely to the low percentage of respondents in survey 1who found this to be the case.

#	Answer		Response	%
1	Standalone website with on-line catalogue		2	12%
2	Part of the local council website, but has an on-line catalogue link		10	59%
3	Uncertain		5	29%
	Total		17	100%

Table 5-40: Description of future website

Section 2: Future Website Information

Question 2.1: Management of the website

This question addressed how the respondents felt their future website may be managed. Table 5-41 provides the information that 43% of respondents felt their website would be managed by their council's I.T. department, compared to 66% in survey 1. In survey 2, 50% expressed uncertainty as to whether their website would be managed by a dedicated library I.T. staff member. In survey 2, 64% felt that the website would contain community information as well as the catalogue, which compares with 92% in survey 1. In survey 2, 7% felt that their website would contain an on-line catalogue only, compared with 3% in survey 1.

#	Question	SA	A	D	SD	U	Responses
1	a) Our future library website would be managed by our local council's I.T. dept	4	2	1	3	4	14
2	b) Our future library website would be managed by a dedicated library I.T. staff member	1	1	2	3	7	14
3	c) Our future library website would contain an on-line catalogue as well as library community information.	5	4	2	1	2	14
4	d) Our future library website would contain an on-line catalogue only.	0	1	3	6	4	14

Table 5-41: Management of future website

Question 2.2: Issues relating to any future website

This illustrates the response anomaly mentioned earlier regarding the incorrect survey being sent to a library with an established website. Further analysis of the survey illustrates that the first response came from the respondent advising an area population of greater than 50,000 people. It is not possible to identify the libraries making the responses, as libraries in this group were not provided with identification numbers.

Text Response
Our library already has an extremely well developed website. We place a high priority on online access to our library services and allocate resources accordingly.
Our goal is to have a dedicated library website managed by a library staff member but this may not be possible.
The chances of having a future library website is very unlikely and does not apply to our libraries out here.
Lack of IT support
We are a small library and have no actual IT staff member, also the time to manage a site is hard to find. Our current site is attached to the council site, and will remain that way, but we are working on being able to manage it ourselves and make it a LOT better!

Table 5-42: Responses to general website issues

Question 2.3: How staff views any future website

The response to this question may show a degree of uncertainty in survey 2 participants compared with the existence of such a website for survey 1 participants. In survey 1, 92% of respondents stated they saw their library website as "an integral part of our library services, and only 8% saw it as an 'optional extra', with no respondents choosing options 3 or 4. The respondent who felt the website was a 'necessary evil' is one of the larger ones in this group, having a population in the 10,000 to 49,999 range. The two respondents who felt a website was unnecessary, had a population of under 10,000, were uncertain as to whether their future website might be 'standalone' or part of the council's website. One of them was obviously a remote library due to the text comment "the chances of having a future library website is very unlikely and does not apply to our libraries out here", which would account for their 'unnecessary' response here.

#	Answer		Response	%
1	An integral part of our library services		9	60%
2	An 'optional extra' to our in-library services		3	20%
3	A necessary evil		1	7%
4	Unnecessary		2	13%
	Total		15	100%

Table 5-43: Staff views of importance of future website

Section 3: Website Accessibility Issues

Question 3.1: Awareness of guidelines

As in the first survey, the majority of respondents are uncertain of the requirements placed on libraries to comply with the guidelines.

In survey 1, 50% agree they are aware of the requirements in Australia for website accessibility, compared with 81% of survey 1 respondents.   Regarding the question as to whether The Australian Human Rights Commission stance on equal access applies to library websites, in survey 2 67% were uncertain, compared with 16% uncertain in survey 1. 58% are uncertain as to the applicability of the Disability Discrimination ACT (1991), compared with 13% in survey 1. 58% of survey 1 respondents expressed uncertainty regarding whether libraries are exempt from above legislation, compared with 22% in survey 1. 75% uncertain as to whether the local government bodies recognize the WCAG guidelines, compared with 44% in survey 1. In survey 1, 75% of respondents felt they understood website, while almost all respondents in survey 2 were uncertain. In survey 2, 75% of respondents felt they would not be planning to check for website accessibility, while in survey 1, 66% of respondents were unsure. This difference may relate to the greater awareness of survey 1 respondents of the issues of website accessibility. In survey 1, 66% of respondents disagreed that compliance was unnecessary, while in survey 2, 50% disagreed. In survey 1, 63% expressed uncertainty as to whether their council had been requested to amend the website to conform to the WCAG, which corresponds to 67% of respondents in survey 1.   Again, this illustrates the degree of uncertainty as to who is actually responsible for the issue. In survey 2, 83% disagree that believe that services for library are more of a priority than those for any future website patrons, which correlates with 81% of respondents in survey 1.

The relationships between the respondents of survey 1 and 2 are significant, as they tend to show the greater awareness of website accessibility issues with those libraries actually having websites with on-line catalogues compared with those who do not yet have this feature.

#	Question	SA	A	D	SD	U	Responses
1	a) We are aware of the requirements in Australia for website accessibility	1	3	0	2	6	12
2	b) The Australian Human Rights Commission stance on equal access applies to library websites.	1	3	0	0	8	12
3	c) The Disability Discrimination Act (1991) applies to libraries.	1	5	1	0	5	12
4	d) Libraries are exempt from the provisions of the above legislation.	0	0	3	2	7	12
5	e) Local government bodies recognize the WCAG guidelines.	0	2	1	0	9	12
6	f) Our future library website would adhere to the WCAG Version 1.0.	0	1	0	0	11	12
7	g) Our future library website would adhere to the WCAG Version 2.0.	0	1	0	1	10	12
8	h) We are not planning to check Our future library website for accessibility.	0	0	1	2	9	12
9	i) We do not believe that there is a necessity for our future library website to comply with these guidelines.	0	1	4	2	5	12
10	j) We would leave it to our sponsoring body to amend our future library website so that it conforms to the WCAG.	0	0	2	2	8	12
11	k) Amendment of our future library website would likely be out of our control.	2	1	4	1	4	12
12	l) Services for in-library patrons are more of a priority than those for any future website patrons.	0	0	9	1	2	12

Table 5-44: Awareness of guidelines

Question 3.2: Other issues relating to website accessibility compliance

There was only one comment in this free-text response.

Text Response
Again, lack of IT support

Table 5-45: Other issues relating to website accessibility compliance

Section 4: Technical Issues

Question 4.1: Technical expertise to meet compliance requirements

In this survey, 42% disagree, and 42% are uncertain as to whether they have the technical expertise to ensure any future website meets requirements. In survey 1, 57% agreed they had the technical expertise and 33% were uncertain. This may relate to the greater experience in survey 1 respondents, and greater staffing and funding available for website purposes. In survey 2, 58% are uncertain as to whether a future website would require technical assessment beyond what they have available 'in-house', which is almost identical with survey 1, where 57%, expressed the same uncertainty. Interestingly, in survey 1, only 1 library had audited their websites and felt it met requirements, whereas 52% were uncertain as to whether this had been done.

#	Question	SA	A	D	SD	U	Responses
1	a) We have the in-house technical expertise to ensure any future website meets requirements.	0	2	3	2	5	12
2	b) A future website would require technical assessment not currently available in-house.	2	1	2	0	7	12

Table 5-46: Technical expertise to meet compliance requirements

Question 4.2: Awareness of accessibility tools

As with Survey 1, respondents were largely unaware of the existence of the accessibility tools listed. Survey 1 respondents were slightly more aware of W3C compliance checks and JAWS, however the majority expressed they were either unaware of the tool or uncertain. The lack of awareness of the web accessibility tools in this group is more understandable, than in the previous group. Unless the respondent was versed in web applications, they would have little need to research these accessibility tools.

#	Question	SA	A	D	SD	U	Responses
1	a) TruWex.	0	0	4	2	6	12
2	b) SortSite.	0	0	4	2	6	12
3	c) Functional Accessibility Evaluator (FAE).	0	0	4	2	6	12
4	d) W3C Online Compliance Check.	0	1	3	2	6	12
5	e) Jaws screen reader.	0	1	3	2	6	12
6	f) Web Accessibility Toolbar.	0	3	4	1	4	12
7	g) HTML 5	0	3	3	2	4	12

Table 5-47: Awareness of accessibility tools

Question 4.3: Other technical issues

No comments

Section 5: Other issues

Question 5.1: Perceived barriers to website accessibility compliance

The purpose of this question was to ascertain what library staff felt would be their greatest barriers to achieving website accessibility. Further analysis shows that in survey 2, 55% of respondents felt cost would be a barrier, compared with 13% of survey 1 respondents. 55% of survey 2 respondents felt technical ability was a barrier, compared with 27% of survey 1 respondents. 55% of survey 2 respondents indicated council support would be a barrier, compared with 20% of survey 1. Lack of input was cited at 36% with uncertainty by 45% of survey 2 participants. In this same category in survey 1, 20% felt this was a problem, 20% were uncertain. In survey 2, 55% were uncertain as to who would be managing the website, affecting the ability to meet accessibility requirements, while this corresponded to 30% agreeing and 47% disagreeing in survey 1. In survey 1, 47% felt council made website accessibility a priority, while 53% were uncertain. In this second survey, 36% agreed and 55% were uncertain.

These results show a greater uncertainty and more concern for the barriers on the part of libraries that do not currently have websites with on-line catalogues. This may be due to a 'fear of the unknown', or purely lack of understanding and communication with the libraries currently operating these websites. Some type of mentoring or communication between libraries developing or even considering websites, and those with established websites could ease some of the perceived uncertainty for the survey 2 respondents.

#	Question	SA	A	D	SD	U	Responses
1	a) Cost would be a barrier to achieving website accessibility compliance.	1	5	2	0	3	11
2	b) Technical ability would be a barrier to achieving website accessibility compliance	3	3	2	0	3	11
3	c) Council support would be a barrier to achieving website accessibility compliance.	3	2	4	0	2	11
4	d) We would not have sufficient input into the library website content to ensure accessibility issues are met.	1	3	2	0	5	11
5	e) Other departments would manage the council's website which would make meeting accessibility requirements difficult.	2	0	3	0	6	11
6	f) Website accessibility is a priority with our council.	0	4	0	1	6	11

Table 5-48: Perceived barriers to website accessibility compliance

Question 5.2: Disability provisions for in-library patrons

This question allowed textual responses from respondents showing what had been done to date to accommodate in-branch patrons with disabilities. Of interest is the low level of response compared to the respondents in survey 1. This may be due to the fact that the libraries in this group are smaller and have fewer funds for assisting disabled patrons. However it may also be that they have not encountered a need to accommodate any disabled patrons, or perhaps that the shire does not yet have disability inclusion plans in place.

Text Response
Disability and Acces Inclusion Plan is in place

Table 5-49: Disability provisions for in-library patrons

Section 6: Benefits of Website Accessibility

The questions in this section relate to the third supporting question: "What are the benefits of conformance?" Asking survey 2 respondents this question was designed to assess whether libraries who do not yet have website with on-line catalogues understood the benefits of website accessibility and usability to the general library population.

Question 6.1: Understanding of importance of website accessibility compliance

The responses indicate that in this survey 2, 45% of respondents agree that is a minority of people who benefit from website accessibility standards, with only 1 respondent disagreeing and 45% uncertain. This compares with 29% agreeing, 50% disagreeing, and 21% uncertain in survey 1. This may relate to a

greater awareness of the need for website accessibility among either larger library systems, with correspondingly larger patron populations, or a greater understanding of the benefits to non-disabled patrons of a more accessible and therefore more usable website.

However, when looking at the second question, 82% of respondents in this survey stated they understood and supported the importance of website accessibility, which is exactly the same percentage as those agreeing in survey 1. With both groups stating they overwhelmingly understand the importance; there is a strong possibility that respondents who do not yet have websites have less understanding of the increased usability of an accessible website.

In this second survey, 55% agree that total website accessibility is achievable, while in survey 1, 61% agree. In survey 2, 55% agree that it is a necessity, while in survey 1, 68% agree. Again, the increased level of understanding is illustrated by the mainly larger libraries which currently operate these websites.

#	Question	SA	A	D	SD	U	Responses
1	a) We believe that there is a minority of people who benefit from website accessibility standards	0	3	2	1	5	11
2	b) We understand and support the importance of website accessibility.	3	6	1	0	1	11
3	c) Total website accessibility compliance is achievable.	0	6	0	0	5	11
4	d) Total website accessibility compliance is necessary.	0	6	0	0	5	11

Figure 5-8: Importance of website accessibility

Question 6.2: Ranking of perceived benefits of website accessibility compliance

The result indicates respondents perceived both assisting disabled community members and general user satisfaction to be the chief benefits. In survey 1, most respondents (76%) placed 'assisting disabled community members' as the most important benefit, with 52% placing general user satisfaction second.

#	Answer	1	2	3	4	5	Responses
1	Increased council reputation with community and other councils	1	0	4	3	1	9
2	Assisting disabled community members	4	4	1	0	0	9
3	Improvement in search engine 'hits' for our website	0	1	2	6	0	9
4	Reduction in possible litigation	0	0	1	0	8	9
5	General user satisfaction with website	4	4	1	0	0	9
	Total	9	9	9	9	9	-

Table 5-50: Perceived benefits of website accessibility compliance

Question 6.3: Other benefits to website accessibility compliance

Text Response
Ease of use is important for everybody, not only disabled people. Non-technical peole and older people need to develop confidence in its use

Table 5-51: Other benefits to website accessibility compliance

Section 7: Conclusion

Question 7.1: Requirement for further investigation

In this question, slightly more respondents (82% compared with 77% in survey 1) felt the issue required further investigation. This would corroborate the uncertainty implied in the previously responses.

#	Answer		Response	%
1	Yes		9	82%
2	No		2	18%
	Total		11	100%

Table 5-52: Requirement for further investigation

Question 7.2: Other issues or concerns regarding survey or website accessibility

Text Response
Lack of staff time and knowledge

Table 5-53: Other issues regarding survey or website accessibility

5.3   Interview Section

In the survey to libraries/library systems with websites, respondents were asked if they would be willing to participate in a follow-up interview. Of the 43 survey responses, 26 responded to this question, 7 (27%) agreed, 19 (73%) declined.   Of the seven positive responses, three were from a single metropolitan city council and two were from another. One library responded that they would like an interview and to view their audit in the future. Two interviews were conducted to review survey responses and provide information regarding the website audit.

Library website 74430

This interview was held with three senior library management staff including those responsible for website content. The interview was positive and the following issues were discussed.

Issues	Outcomes
How should a site be checked – staff had not previously been aware of the tools used	Agreed after looking at definition of a government website in National Transition Strategy, that libraries are 'government' and hence come under the new requirements
On-going issues with Marketing/IT and Administration, including how to get material on the website in a timely manner	They will continue to work on their compliance
Previously unaware of the government regulations including the new National Transition Strategy	Appreciated the information and the audit results
Pleased with their audit checklist (they scored 18/18), but concerned about other issues	They were surprised at the general apathy to the issue and believed it may be due to lack of awareness of the importance and legislation
One of the most pressing problems is that staff members who put material into their CMS are not always using the checklist they provide. The audit highlighted that they have included items such as 'smiley's'. Reviewed the SortSite report which showed which particular pages they appear on – probably by one individual.	They would like to be involved in continued dialogue
Regarding the survey, they felt most library staff had little knowledge of the issues and importance, as they don't put material on the website.	Emailed them the complete audit and link to National Transition Strategy

Table 5-54: Interview with Library 74430

Email comment:

> It was great that you were able to come in and share your findings with us. We all found the experience very informative and educational.

Library website 53815

This interview was held with two senior library management staff. This interview was also positive with the following issues addressed.

Issues	Outcomes
Felt that their Council probably does not understand the importance of the issue	Basically the same as the other library
Have accessibility policy, but this policy has not really extended to website issues	They would be interested in a follow-up presentation to council staff/councilors
Feel there is some discrepancy between Council/administration priorities and Library priorities	Appreciated the audit information
They experience a bottleneck in getting items on website in good time, as all items must through marketing	Wanted to be involved in on-going information on the issue.
They believe they have the technical ability on staff, but were not aware of the tools	
They have problems finding enough time to do the work, and feel they would benefit from temporary help to get the compliance work done	
They were not aware they came under legislation for government sites	
Regarding the survey responses, they felt that most library staff were largely unaware of the issues and ways of combating them, as they had no input into website	

Table 5-55: Interview with Library 53815

Email comment:

> I'm sure I speak for (*names removed*) when I say that we found it very useful and a sort of a 'wake- up call'...

5.4   Analysis and Discussion

In the SortSite analysis, all of the websites had markup errors and, as stated previously, this causes screen-reading assistive technology to miss content. The accessibility is the category most measured for WCAG 1.0 and 2.0 compliance issues. The best result with this tool was library 97613. This same website rated in the top in the FAE evaluation, giving credence to the reliability of these tools for this type of audit. The scores for the W3C validation of both HTML/XHTML and CSS were also among the best. So, while they do not pass the guidelines, they will have much fewer items to correct than the majority of libraries audited. This library scored 12 points on the manual checklist which, while not the best, was slightly above average. Some of the problems include certain necessary features not being located in the most convenient location (at the very bottom of the page as well as an absence of some ALT tags missing. The absence of ALT tags was one of the items noted occurring in 94% of the websites audited. This website had one of the most common problems encountered in the manual checklist in that the search feature related to the entire council and did not return useful results when given a library search, such as "reserve a book", example answers included a listing of community reserves. This type of problem is not located by the automated checking tools, as they look for the provision of items, and the coding, and not where they are located. This is the reason for providing the manual checklist and also checking a sampling of the websites with *JAWS* to see how they perform with screen-reading software. This particular website, being among the higher ranking websites, was chosen for the JAWS evaluation. While it was the only one that *JAWS* could navigate successfully, there were still difficulties including the time taken and excessive number of clicks required to reach the destination.

The library chosen as 'middle of the field' for the *JAWS* evaluation, had close to the median score for Overall in *SortSite*. It was also close to the median for Accessibility with a score of 8.52% of the web pages with Accessibility errors. This same library had the maximum percentage of pages that failed Navigation/Orientation check in *FAE*. In the area of W3C Validation, this website scored very close to the middle of the range. Checking this same library in the manual checklist indicates that they also scored in the average range for this test with a score of 11 points. There were numerous problems found when viewing the website manually such as a complete absence of listed accessibility or re-sizing features. The colour contrast was insufficient in the links for patrons with vision problems, and search features did not relate to libraries. It was not possible for the researcher to find a catalogue item with *JAWS* on this site as the link could not be interpreted. This is the same link a patron would use to view their library record – precluding anyone using a screen-reader from accessing their library information. This analysis again verified the testing method – there were numerous accessibility errors highlighted by the automated tools, *JAWS* could not perform a catalogue search, and the manual checklist highlighted numerous problems that would preclude accessibility for patrons who were visually-impaired.

The last library chosen for the *JAWS* evaluation (15273) was one that scored in the lowest ranks for both *SortSite* (Overall 29.67% of pages fail, with 24.33% of pages failing Accessibility) and *FAE* (16% of the pages failed the Navigation/Orientation testing). The manual checklist scored 11 points, but highlighted that this is a very new website. Surprisingly for such a new website, there are with no accessibility

features available including no site map, or re-sizing features. The links to the catalogue and renewal/reservation features did not have ALT tags, again making it impossible for a screen-reader to describe the contents of the link. This was reinforced by the *JAWS* evaluation which was not able to run on this site, as the button to link to the library catalogue did not have an alternate text for the screen-reader to describe.

Tables 5-7 and 5-8 demonstrate these representative websites provide a consistency of scores. While no website was at exactly the same placement rank in each evaluation, there was consistency in the area in which they scored with each assessment. This comparison validates further the selected audit tools. The audit was further validated by the manual checklist and the *JAWS* evaluations.

Comparing the results from libraries with large population bases and the smaller libraries, there appears to be a correlation in the data between size of population and awareness of accessibility issues. The website chosen as the best rating library across the audit tools, is one of the largest and also expresses that their population is best represented as 'retirees'. This particular demographic group would possibly require more accessibility options due to age-related issues. They express that their website is heavily utilised, and that patrons are aware of the on-line catalogue. They also state their website is an integral part of their library services, while expressing uncertainty across all of the WCAG guideline compatibility issues. They also expressed uncertainty as to whether they have the technical expertise to ensure their website meets requirements. This library indicated that both cost and constant technological change affected website accessibility compliance. They also stated that time and technical ability as the top difficulties they face in meeting requirements. Of interest is that they state that they are uncertain as to whether total website accessibility compliance is achievable, or necessary. However, they rate that assisting disabled community members is the most important benefit of website accessibility compliance.

Chapter 6 Discussion and Conclusion

This last chapter discusses the results of the findings from this case study in relation firstly to the supporting and finally to the principal research questions. The final section of the chapter will provide a summary of the discussion.

6.1 Implementation and limitations of the research

Overall, the research progressed well with few problems encountered in either the design or implementation of the study. If anything, collection and collation of the large amount of data in the time permitted posed one of the most demanding aspects of this research project. In the surveys, the response rate was considered more than adequate to provide generalisable results. There were strong correlations and interesting differences encountered between the two surveys which enabled some of the conclusions presented in this study.

Respondents to the surveys were enthusiastic and supportive in their responses. There was a willingness to provide descriptive text when prompted and these answers have provided considerable explanatory benefit to the Likert scoring employed in the remainder of the question.

It would have been more beneficial to have more libraries interested in providing a follow-up interview. Allowing an interview would have enabled the researcher to present the results of the library website audit to the staff, so that the process of achieving website accessibility compliance could be assisted. The two interviews that were conducted provide a strong case for continued study in this field, as well as enabling the provision of their audit results.

6.2 Future Research

Developing a model to assist this group to achieve website accessibility compliance may be the subject of further study. The current research conducted has enabled a basic selection and testing of tools, which could prove beneficial in follow-up studies. The methods developed through this research verify the findings in the literature review, which overwhelmingly endorsed the hybrid approach used.

The National Transition Strategy (Australian Government Information Management Office (AGIMO), 2010b) mentioned earlier has a Work Plan which indicates that in the period of July to December 2010, preparation should be made to prepare for the changes necessary. The transition phase is set for January to December 2011 and the final implementation by December 2012 for Level A, and 2014 for level AA. From this research, it would appear that public libraries in Western Australia may need assistance to meet these targets.

6.3 Supporting Research Question 1

Is there a willingness to conform to the guidelines?

The findings support that while libraries are generally supportive of the need for website accessibility, they are largely unaware of the legal and moral necessity to implement the features. As noted in the survey analysis, there is a demonstrated lack of awareness of the guidelines, the need to adhere to these guidelines, and tools available to assist with compliance among the public library websites in Western Australia. Respondents appear mostly unaware of the tools available to check their websites as well as being unaware of the necessity to do so. Libraries are generally unsure as to who has the responsibility to check and implement the accessibility features. This is strongly supported by the qualitative comments provided in the survey questions by both groups.

6.4 Supporting Research Question 2

What are the barriers to public libraries in conforming to the guidelines?

Time and cost were clearly identified as the most perceived barriers to conforming to the guidelines in answer to the supporting question. Libraries surveyed indicated little understanding as to whether:

- their websites comply with the guidelines
- libraries are required to comply
- how they would check for compliance
- what tools are available to assist with complying with the guidelines

One could assume that as websites evolve, they become progressively more accessible, however Leuthold points out this is not the case, and that studies have found that the reverse is true, "... websites became progressively inaccessible, whereas their complexity increased over the years. These results suggest that missing knowledge is not the main reason for the lack of development of accessible websites. One problem area could be financial aspects."(Leuthold, Bargas-Avila, & Opwis, 2007)

The finding of this research regarding the perceived barriers (chiefly cost and time), demonstrate the need to increase awareness of the issues and importance of striving toward website accessibility. The anecdotal comments also highlight the need for council (and administration staff) awareness of the issues and legislation regarding website accessibility. This research has highlighted the need for a greater understanding of the issues and importance, including communication between those libraries who currently operate websites and those who do not yet have a website with an on-line catalogue.

6.5 Supporting Research Question 3

What are the benefits of conformance?

The respondents clearly indicated that they perceived that the main benefits to website accessibility were assisting the disabled community members, and general user satisfaction with the website.

According to Kuzma (2010),

> Having a site that meets accessibility requirements will open the market to a wider range of customers and will provide people with disabilities a more positive experience and increase the value of the site.

The survey results demonstrate that very few libraries understood the improvements in overall user experience that occur when a website meets accessibility requirements. The literature review indicated that a strong business case can be made for ensuring accessibility, which includes overall user satisfaction, reducing the risk of litigation and improvement in the return rate from search engines for the websites. Local government councils are working toward promoting their area to potential residents, thus the need to understand how the council website may appear higher in the search engine return should be understood. The considerable legal cost associated with a complaint to the Australian Human Rights Commission should also not be overlooked when assessing the cost of bringing a website up to accessibility guideline compliance.

The results of the survey indicate that there is a general understanding that websites should be accessible, and that is benefits people with disabilities. However, the results show a direct connection to understanding the specific issues relating to website accessibility compliance and understanding the barriers and benefits of that compliance.

6.6 Principal Research Question

What is the level of adherence in public libraries in Western Australia to the W3C Web Content Accessibility Guidelines, Version 1.0 and 2.0?

The website audits conducted were designed to answer this principal question. The W3C, the acknowledged experts in the field, providing the internationally accepted guidelines, state:

> A preliminary review combines some manual checking of representative pages on a Web site, along with the use of several semi-automatic accessibility evaluation tools...
> ... experienced users of screen readers may substitute a screen reader for a voice or text browser, but if blind, may need a sighted partner to compare information available visually; if sighted, listen to it with eyes closed, then open eyes and confirm whether the information is equivalent.(W3C, 2006)

Kane (2007)validates the necessity to employ more than automated testing tools for website audits,

> These tools may assist developers in the creation of accessible web sites, but may not be able to identify all accessibility issues. For this reason, automated tools are often used in combination with some type of manual evaluation or checklist...Recognizing the limitations of automated tools, some researchers have combined multiple methods to achieve more robust accessibility measurements. Researchers have combined the results of multiple automated tools and have compared automated tools to human evaluators.

The answer to the principal research question is that at present, none of public libraries in Western Australia who have websites with on-line catalogues (other than those linking to the State Library of W.A., conform to any level of the *Web Content Accessibility Guidelines*, either Version 1.0 or 2.0. This has been confirmed by the website auditing tools mentioned previously including the W3C's own validation tools. The audit results of the individual libraries differ, with some of the websites being much closer to conformance than others. The research also looked at issues of 'usability' in conjunction with the 'accessibility', as mentioned in the literature survey, having a website that ticks all the validation boxes does not necessarily make a user-friendly website. However websites that do not pass the necessary validation will present problems to disabled users, particularly those using assistive technology.

6.6   Conclusion

The purpose of having a website that meets accessibility guidelines is to enable as many people as possible able to use it easily and effectively. According to Lilly (2000), "An effective public library Web site requires a presentation and organization that allows users to know all that the library has to offer electronically". This is confirmed by Sadeh (2007),

> One of the main challenges in offering any kind of scholarly search interface is to make it as familiar and intuitive as the one used by web search engines and other internet tools but to guarantee that it yields better results.

This research aimed to investigate questions relating to the level of adherence to the WCAG 1.0 and 2.0 guidelines, as well as determining awareness, and perceived barriers and benefits of website accessibility. The approach employed a case study methodology using both quantitative and qualitative tools. The literature review clearly indicates that a variety of methods must be used to obtain a true picture of the accessibility and usability of a website, and the importance of not relying solely upon automated tools.

From the literature studied, it is clear there is a need to achieve website accessibility compliance, particularly in relation to recent legislative changes, demonstrated by the Web Accessibility National Transition Strategy (Australian Government Information Management Office (AGIMO), 2010b). In the

interviews and the survey conducted, it would appear that there is no argument that libraries must achieve compliance, along with all other government and associated services.

The audit used a variety of quantitative methods of evaluation including a number of different automated website checking instruments. Qualitative methods used include a manual checklist, and an evaluation of a selection of the website with the JAWs screen-reading software.

The supporting questions were addressed by the qualitative surveys and interviews. As stated previously, there is a large degree of uncertainty by the respondents of the state of their website compliance, and how to improve it. Most respondents indicated that they support the need for further study of the issue of website accessibility, which may be the result of future research.

The principal research question was addressed by the website audits conducted which demonstrated resoundingly that there is no compliance presently in Western Australian public libraries with WCAG 1.0 or 2.0 and that there is much work to be done to achieve this compliance. This finding supports those of the various studies cited in the literature review. While great steps have been taken to endorse the guidelines, there is a great deal of work to be done to achieve compliance. Leuthold (2007) reaffirms the need for websites to adhere to the guidelines, "Application of these guidelines ensures that HTML code is readable by screenreader software like JAWS, supporting handicapped users to access the website."

Libraries will undoubtedly find themselves in a state of great change over the next few years as they begin to address the National Transition Strategy. Brophy (2007)states, "In a public access setting, such as a library, it is also essential that staff are fully trained in the use of assistive technologies provided on the open access computers. Staff must feel confident in providing assistance as well as be aware of the particular difficulties faced by visually impaired people."

It is expected that both the barriers and benefits of website accessibility will become clearer as this happens. Library staff may find themselves requiring even more skills as they embrace the issue of website accessibility and may require further training to cope with additional responsibilities.

> ...if libraries manage to create a more satisfying user experience, they may very well regain their leadership as providers of scholarly information, because they enjoy several important advantages over the internet tools (Sadeh, 2007)

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Appendix 1

Comparison of WCAG 1.0 Checkpoints to WCAG 2.0, in Numerical Order

http://www.w3.org/WAI/WCAG20/from10/comparison/

Appendix 2
Checklists for Top, Mid-range and Low-range websites

Library Website Checklist

ID# 97613

Description	Yes	No	n/a
1. Accessibility features are easy to find *	x		
2. Prominent 'contact us' link with details	x		
3. Clear text resizing controls at top of the page (see above)		x	
4. Clearly marked home link on every page	x		
5. Homepage lists key tasks	x		
6. It is easy to find shire and community information	x		
7. It is easy to find general library information	x		
8. It is easy to find out how to join the library	x		
9. It is easy to find a catalogue link	x		
10. It is easy to order an item	x		
11. There is a simple site map *	x		
12. There is prominent search feature	x		
13. The search feature is easy to use		x	
14. Search results are simple to interpret and useful		x	
15. Low bandwidth version of the page is available		x	
16. Language translation link is available		x	
17. ALT tags are present for all images		x	
18. Presentation – well laid out and inviting	x		
12/18			

* Notes:

Accessibility –link to information on accessibility, site map and re-sizing of text are all found at the bottom of the page. This may be better placed at the top of the page. Information is comprehensive and includes a link to download Adobe Acrobat.

Contact details are also at the bottom of the page.

While there is not a 'home' link, there is a trail to follow back.

Search feature relates to whole of city, searches conducted for 'reserve book', 'reserve a book', and 'membership' did not return any library-related hits.

Alt tags – some images have tags such as 'thumbnail', and others no tags at all

Library Website Checklist

ID Number: 25979

Description	Yes	No	n/a
1. Accessibility features are easy to find		x	
2. Prominent 'contact us' link with details	x		
3. Clear text resizing controls at top of the page *		x	
4. Clearly marked home link on every page	x		
5. Homepage lists key tasks	x		
6. It is easy to find shire and community information	x		
7. It is easy to find general library information	x		
8. It is easy to find out how to join the library	x		
9. It is easy to find a catalogue link	x		
10. It is easy to order an item	x		
11. There is a simple site map	x		
12. There is prominent search feature	x		
13. The search feature is easy to use	x		
14. Search results are simple to interpret and useful *		x	
15. Low bandwidth version of the page is available		x	
16. Language translation link is available		x	
17. ALT tags are present for all images		x	
18. Presentation – well laid out and inviting *		x	
11/18			

* Notes:

Re-sizing & Accessibility Options:

No prominent re-sizing option.

Link to re-sizing and accessibility options at bottom of page does not work from either city homepage or library homepage. Searching for accessibility found no matches using search feature.

Search Feature

No search results shown for 'accessibility' even though there is a broken link for 'having problems reading this page', and 'access' brings up items about accessing documents and facilities

Presentation

Too much white space and poor colour contrast for links.

Library Website Checklist

ID#: 15273

Description	Yes	No	n/a
1. Accessibility features are easy to find		x	
2. Prominent 'contact us' link with details	x		
3. Clear text resizing controls at top of the page		x	
4. Clearly marked home link on every page	x		
5. Homepage lists key tasks	x		
6. It is easy to find shire and community information		x	
7. It is easy to find general library information	x		
8. It is easy to find out how to join the library	x		
9. It is easy to find a catalogue link	x		
10. It is easy to order an item	x		
11. There is a simple site map		x	
12. There is prominent search feature	x		
13. The search feature is easy to use	x		
14. Search results are simple to interpret and useful	x		
15. Low bandwidth version of the page is available		x	
16. Language translation link is available		x	
17. ALT tags are present for all images		x	
18. Presentation – well laid out and inviting	x		
11/18			

* Notes: as this is a new website development. Lack of accessibility features in a website this new is of concern.

Accessibility: no features located

Site map: none found

Resizing: no feature found

Shire & community information: not provided, but this is a combined shire library, so that is understandable. Some community history is provided.

The image links to the catalogue and renewal/reservation features have no alt tags. A screen reader would not be able to provide information on what this link does.