Synopsis
The growth of e-government over the next five years will transform the way government interacts with external bodies and individuals. It will also transform much of the work undertaken within government.

For people with disabilities this change can significantly enhance access and opportunities. However, if the change happens without regard to accessibility, e-government could establish insurmountable barriers for employees within government and for those seeking to interact with government.

This paper discusses the key accessibility issues raised by e-government and outlines 10 priorities for moving forward. These priorities relate to:

- roles and responsibilities of government
- e-government implementation
- procurement policies
- access to technologies
- quality assurance
- technical skills.
Introduction

The Internet is probably the most far-reaching technological innovation of the late 20th century, but its rapid growth is creating a technological divide between sectors of the population.

People with disabilities or impairments are one group that has a high potential for being disadvantaged (see Attachment 1). Other groups, such as people with low bandwidth connections, older equipment, low technology skills or literacy problems can have needs similar to those of people with disabilities or impairments. In some Indigenous or rural and remote communities these disadvantages compound.

The concept of accessibility in this paper relates to the capacity of users to adjust the interface of web and software applications to meet their visual, hearing, dexterity, cognitive or speech needs, by either:

• customising options that are built into their personal interface device (such as a personal computer) or are available through the particular application they are using (such as a web interface) and/or

• using speciality hardware and software products (assistive technology products). ¹

Definitions of e-government and e-government strategies focus on two broad benefits:

• government that is more open and inclusive of its citizens

• government that is more efficient and effective.

The Organisation for Economic Cooperation and Development defines e-government as ‘the use of information and communications technologies, and particularly the Internet, as a tool to achieve better government’ (OECD 2003a; 2003b). The National Office for the Information Economy defines e-government as ‘the use of available and emerging technologies to create seamless, responsive and citizen-focused government for the benefit of all’ (National Office for the Information Economy 2002). ²

The recent World Summit on the Information Society talked about the need to:

implement e-government strategies focusing on applications aimed at innovating and promoting transparency in public administrations and democratic processes, improving efficiency and strengthening relations with citizens ... develop national e-government initiatives and services, at all levels, adapted to the needs of citizens and business, to achieve a more efficient allocation of resources and public goods (World Summit 2003a, para. 15).

This paper will explore the accessibility issues raised by, or highlighted by, the growing development of e-government in Australia. The recommendations in this paper are intended to ensure e-government truly meets its objectives of enhancing efficiency and benefiting all Australians.

It is the basic contention of this paper that e-government which is not accessible is neither efficient nor inclusive.

Government policy and practice: state of play in Australia

The law

Australia enacted the Disability Discrimination Act in 1992, prior to the, now ubiquitous, World Wide Web. However, the case of Maguire v Sydney Organising Committee for the Olympic Games³ in 2000 clearly demonstrated that the Australian Disability Discrimination Act 1992 applies in the online world (Worthington 2001).
While government in Australia was an initiator in establishing accessibility policy for online activity, many of these policies have remained unchanged since the late 1990s. Other sectors of the economy came to the fore, with respect to online accessibility policy, in 2004.


**Government policy and practice**

The Human Rights and Equal Opportunity Commission makes it clear that the Australian Government cannot plead undue hardship: so why are so many government sites and online services relatively inaccessible?

The accessibility section in the National Office for the Information Economy’s Guide to Minimum Website Standards (National Office for the Information Economy 2003a) states that conformance to WCAG1.0 at the Single-A Level is a minimum rather than a desired level of accessibility for Australian Government web sites. However, most Australian Government web sites have treated the minimum level as the required level. In contrast, half of the Australian states and territories have adopted conformance to WCAG1.0 at Level Double-A as their recommended standard.

Some states (for example, Queensland) have taken the Canadian path (Treasury Board of Canada 2002) and are adopting a common look and feel that incorporates accessibility. This provides a common user interface across government departments and makes it easier for citizens to interact with the different government business areas. It also makes monitoring and enforcing accessibility standards easier.

Despite these advances, many government online services remain inaccessible or very hard to use. Recent work for the Disability Rights Commission of Great Britain by Professor Helen Petrie (Disability Rights Commission 2003) has shown that almost all United Kingdom Government web sites are practically inaccessible, despite the attempts by many agencies to achieve some level of conformance with standards in accordance with quite stringent government policies. We believe that a study of Australian web sites would show similar results.

One cause of the problem is that the government’s online offerings have been largely driven by the requirements of Government Online (National Office for the Information Economy 2000). This strategy emphasised the importance of getting information online, but did not focus on the importance of enabling interaction with government. For example, the Online Information Service Obligations set out material that must be available online and set target dates, but did not require online interactivity (such as being able to complete and submit a form online).

By contrast, e-government focuses on two-way or multi-way interaction between government and individual citizens or other organisations. It aims to enhance the undertaking of whole functions, not just to provide information.
Accessibility issues for operation and delivery of e-government

Delivery channels

Government agencies and departments need to deliver and receive information in order to undertake a transaction or function. People with disabilities are involved as both deliverers and receivers of information and are both government employees or contractors, and customers of government.

Different delivery channels may be appropriate for the various parts of an entire end-to-end process. For example, a business seeking to export goods or services may:

• have a face-to-face discussion initially, to understand the range of government services available and the issues their business needs to consider
• follow up with a detailed review of online information about markets and government programs
• seek further information via email, human-to-human telephone contact or video conferencing
• download forms and return some online and some in hardcopy
• make payments to government and receive funds through electronic transactions
• provide accountability information or statistical information online.

This means the accessibility of both the online and off-line aspects of an interaction with government need to be considered.

The idea of considering the whole end-to-end process and integrating online and off-line components is central to the e-government initiatives developed in Washington State. They have focused on real business issues and have integrated the evolving e-government initiatives with established off-line practices (Access Washington 2004).

People with disabilities range from technology savvy to technology phobic and everything in between – mirroring the general population. This means many people with disabilities will not be able to access government services delivered as e-government programs, even if the services fully comply with accessibility guidelines. Consequently all of the delivery channels for government services must be accessible. And each entire end-to-end process, using several delivery channels, needs to be accessible.

Web (desktop, mobile devices, kiosks, etc.)

In general it is easier to make a web interface accessible than it is make native application interfaces accessible. Away from web languages, there is less standardisation and fewer well developed techniques for addressing accessibility issues. Nevertheless there is a raft of accessibility guidelines and techniques for both web languages and software languages.\(^6\)

Accessibility techniques are most developed for web interfaces delivered via a full screen desktop. Effective and elegant implementation is the issue. This requires knowledge of the techniques and an understanding of usability issues affecting people using assistive technologies in addition to the traditional skills of design and development.

For mobiles devices and Personal Digital Assistants (PDAs), software is now available that will render a web page effectively and useably on small and medium screens, but only if it has been designed with accessibility in mind (for example, Opera 2004).
Touch screens (kiosks and other public access terminals) create particular challenges for accessibility. Among the issues to be considered are:

- physical access to the touch screen for people with physical impairments
- high levels of environmental noise and visual glare
- enabling people with severe vision impairments to input to the terminal and receive feedback about the choices they make.

Whilst it is possible to overcome these problems, it can be expensive, and most off-the-shelf kiosk or touch screen products will have major accessibility problems. Development of more accessible ATMs may help develop more accessible kiosk-type delivery channels.

Another option being trialled is the use of smart cards to customise standard computer interfaces and to enable assistive technology. This technology will help make public access computers and, ultimately, kiosks accessible for a wide range of older people and people with disabilities.

**Multimedia, video conferencing, interactive collaboration**

For multimedia, accessibility issues particularly affect people who have a vision or hearing impairment. Techniques for providing synchronous captioning and audio description of visual elements are well developed and the tools for doing this are readily available. The National Centre for Accessible Media, for example, has developed an excellent free tool called MAGpie (National Centre for Accessible Media 2004).

As e-government evolves, there will be a growth in use of collaboration technologies, including video conferencing, to facilitate increasing levels of interaction between government, non-government organisations, and citizens. The primary accessibility issues for video conferencing relate to the accessibility of the audio component and access to the visual component of any collaboration elements. There are promising initiatives in real time captioning being developed for use in the tertiary education sector. Ultimately these could have applicability in the video conferencing arena (and perhaps even in voice telephony).

Online chat and collaboration is widely used in e-learning and in some areas of business communication (in addition to their recreational uses). These collaboration tools can be particularly difficult for people with disabilities to use effectively. However, the University of Toronto has developed some fully accessible collaboration tools (ACollab, AChat) that are available under the GNU General Public License Version 2, June 1991, which provides for free use, distribution and modification (University of Toronto 2004).

**Other delivery channels (telephones: fixed line and mobile, bricks and mortar outlets, in-home service)**

E-government will often require the use of intermediaries to assist a citizen or organisation to complete the full end-to-end process. Consequently, the accessibility of delivery channels, such as the telephone, in-home/on-premises transactions and the role of bricks-and-mortar outlets, need to be addressed.

Interactive Voice Response systems (including those incorporating speech recognition) must consider the needs of users who have slow response times, poor hearing, speech impairments, or difficulty in remembering and/or processing a range of complex choices. Having access to a human operator as a fallback is a key element in any solution that addresses accessibility. The issues with Interactive Voice Response accessibility are well addressed in the Australian Bankers Association’s *Telephone Banking Standards* and in the *Australian and New Zealand Standard on Interactive Voice Response*. 

Centrelink has successfully implemented these standards for its client channel.

Many government services are delivered in a citizen’s home or place of work (such as Tax Audits and Veterans’ Affairs Home Care services). The in-home components of these processes are increasingly integrated into an e-government system, through use of mobile technology by the government employees or contractors delivering the service. Accessibility issues arise when citizens are required to verify electronic data, sign a hard copy record or authority, or where a record of transactions or personal details needs to be left with the citizen.

Physical premises face similar accessibility issues when a citizen needs to verify or sign, or when they need a record of a transaction. At a physical site it is easier to have technology on hand to produce such material in, say, large print, but accessibility issues will still arise for some customers and for government employees. Supportive material (information brochures, application forms etc.) also needs to be available in a range of accessible formats (large print, audio, Braille, plain English) and people need to be able to request any personalised documents in an accessible format. Agencies such as Centrelink already provide this service.

The importance of a physical access point, to complement e-government initiatives, has been demonstrated through the ServiceTasmania initiative. For people with disabilities these alternative means of transacting business with government are critical.

**Industry skills and practice**

A key reason for the poor accessibility (and often poor usability) of many government online offerings is bound up in the traditions, practices and skill levels of the information technology and print communications industries.

For much of its history, the information technology that has supported the complex operations of government has been in the back room: a closed environment whose users are predominantly highly skilled and technology focused. Consequently, software development and testing procedures are geared towards technical functional requirements with little or no emphasis on user-centred design. The question for a developer is usually ‘Does it work in the client’s environment?’ not ‘Do the intended end-users find it easy to undertake the tasks they need to do (or want to do)?’ The requirements of e-government mean both questions are of equal importance.

The conventional understandings and techniques of print communication also create unintended barriers to accessibility. In print, precise visual layout is critical to successful communication and a single print document must try to meet the needs of readers in a wide variety of situations. On the web, these techniques and understandings are not appropriate to either accessibility or usability. They fail to take advantage of the interactive nature of the web’s information and its interface that enables users to access only relevant material, and prevent people using the customising and access options that the technology permits.

The techniques for accessible and usable information and communications technology design are evolving, particularly in response to new and emerging technologies. Only a small minority of web and software developers have been trained in these techniques. For the reasons discussed, both formal and informal training for the developers has been almost entirely focused on techniques to make things work, with only a small emphasise on making it work well for all the intended users. Often, technological innovation and innovative design has taken precedence over functionality and usability. So, even where accessibility requirements are specified in government contracts, implementation by developers tends to be limited or rule based and not related to the real usability issues faced by people with disabilities.
This problem is exacerbated by a lack of knowledge of the accessibility guidelines among web and technical managers, business managers, corporate communication managers and site commissioners within government. It is often difficult for managers to determine whether government accessibility requirements have been competently and fully met without independent expert advice.

Web sites and online services are dynamic, and government sites undergo continuous changes of content, functionality and design. This means accessibility has to be continually checked and problems rectified. It is not a once-only problem to be resolved prior to launch of a site or online function. Quality assurance within the web environment is an ongoing problem across a whole range of critical areas (branding, privacy, security, functionality), including maintenance of accessibility and usability standards.

Despite this gloomy picture, there has been some progress in accessible design, particularly across the spectrum of government and there is increasing interest in ensuring online services are both accessible and functional. For example:

- several government departments are addressing both technical accessibility and practical usability for people with disabilities across their most critical online services
- many tertiary level information technology courses now give some attention to accessibility and usability within the academic program.

Industry and professional groups are taking some responsibility:

- The Australian Interactive Media Industry Association and the Internet Industry Association have developed a joint Accessible Web Action Plan. The vision is that Internet Industry Association and Australian Interactive Media Industry Association members’ web sites set benchmarks for best practice in web accessibility.
- The Australian Computer Society has also taken an interest in accessibility and the annual AusWeb Conference includes accessibility papers.
- In Europe, the British Web Design and Marketing Association (Usability and Accessibility working group) is seeking to establish an accreditation system to ensure developers have competence in accessibility techniques. There is some interest in Australia in exploring this concept.

**Issues for users who need assistive technology**

E-government is predicated on interaction between users and government. This is only possible if the users have access to appropriate equipment and have the skills to use it.

Both state and federal governments have worked hard to enhance information technology skills within business and the general community. Public access computers are widely available in libraries and community centres. Computer use in business is very high and computer access at home has stabilised at approximately 65 per cent (National Office for the Information Economy 2003b).

But some groups are still missing out.

People with significant disabilities face substantial barriers, above those faced by most other users, to obtain access to the technology and training they need to be active participants in e-government.

State government programs, such as Skills.net in Victoria and the Commonwealth Government’s initiative to improve computer skills for older workers (Basic IT Enabling Skills – BITES – for Older Workers), have been very successful for many disadvantaged groups, but have not addressed the
training needs of people with significant disabilities. For instance, people with severe vision impairment take several times longer to reach basic competence in use of the Internet, even with access to specially developed training programs and when training is conducted in very small groups (Vision Australia 2001).

If people with disabilities need assistive technology products (screen magnifying programs, specialist access peripherals, speech activated software etc.) they face significant financial barriers.

One option to bridge this financial gap is to modify the universal service obligations of Australia’s telecommunications carriers.

The universal service obligations ensure that all people in Australia have reasonable access to the Standard Telephone Service. Standard Telephone Service is defined as a carriage service providing voice telephony, or an equivalent service. The Standard Telephone Service also includes an appropriate handset or other customer equipment that allows a person with disabilities to communicate over a telephony network. Provision is also made for people who cannot hear or cannot speak to access voice telephony through use of telephone typewriter (TTY) machines and through the National Relay Services.\footnote{The universal service obligations ensure that all people in Australia have reasonable access to the Standard Telephone Service. Standard Telephone Service is defined as a carriage service providing voice telephony, or an equivalent service. The Standard Telephone Service also includes an appropriate handset or other customer equipment that allows a person with disabilities to communicate over a telephony network. Provision is also made for people who cannot hear or cannot speak to access voice telephony through use of telephone typewriter (TTY) machines and through the National Relay Services.}

The universal service regime obliges universal service providers (currently Telstra is the only universal service provider) to make standard telephone services and payphones reasonable accessible to all Australians. Comparable services must also be provided for people with disabilities. The regime also provides a separate but related obligation to provide digital data access under the General Digital Data Service Obligation and the Special Digital Data Service Obligation (Division 3 of Part 2 of the Telecommunications (Consumer Protection and Service Standards) Act 1999). This obligation provides for access to a 64 kilobits per second (kbps) data service on request. The primary universal service provider, Telstra, provides a dial-up Internet service, with a guaranteed minimum equivalent throughput of 19.2 kilobits per second (kbps), on request, to all users of its fixed line network. A number of Commonwealth initiatives, including the Higher Bandwidth Incentive Scheme and the Internet Assistance Program are improving access for all people to broadband and data services.

As specified in the Telecommunications (Equipment for the Disabled) Regulations 1998, a universal service provider (currently Telstra) is obliged to supply equipment to people with disabilities for the purpose of accessing standard telephone services. Expanding the scope of Telstra’s Disability Equipment Program to the digital data obligations would improve the prospect of all people with a disability taking advantage of e-government initiatives.

Other issues to be considered

Privacy, security and feedback

Everyone who is using e-government services will be concerned about issues such as privacy and security. Privacy statements, security symbols and the like are provided on e-government sites to address these concerns. However, for many people with disabilities, these reassurances may not be readily apparent.

The nature of many impairments, and the limitations of assistive technology, make input errors more likely, make it harder to check the information that has been entered, and make it more difficult to comprehend error messages.

Security and verification systems can impose barriers on people with disabilities. For example, a system that requires a person to copy some text in a bitmap image into a form (to show they are human not a machine), will exclude people with vision impairment and many people with learning disabilities or cognitive impairment (W3C 2003).
Research is needed to identify how these security, privacy and feedback issues can be most effectively managed for people with different disabilities and different types of assistive technology.

**Government employees (including tele-workers and outsource contractors)**

The move to e-government is having a major impact on the day-to-day work of many employees within government. As more and more work is dependent on interfacing with technology, employers will need to ensure that employees with disabilities are still able to contribute effectively in the workforce. The essential conditions for this are:

- assistive technology that is readily available and regularly upgraded
- applications and interfaces that are customisable and that work with assistive technology
- training in the use of assistive technology and training in use of mainstream applications that is appropriate to the needs of the employee – for example, training should be based on keyboard commands for a person with a severe vision impairment or with a physical impairment that prevents use of a mouse, and training materials and manuals should be available in the appropriate accessibility formats
- everyday working tools – software, telecommunications, information and communications technology devices and online content – that are fully accessible and designed with usability in mind for people accessing those technologies using some sort or assistive technology or customisation.

A review of these issues, conducted for Industry Canada, highlighted the breadth of the problems faced by employees with disabilities (T-Base 2003).

**International developments in accessibility**

There is significant activity internationally that will deliver gains in accessibility across the board provided Australia is savvy enough to piggy-back on them and adopt them where appropriate.

**Standardisation, design-for-all and universal design programs**

The browser ‘features wars’ of the mid-1990s have stopped. Instead we are seeing standardisation across browsers and media players with the adoption of the W3C HTML and other standards leading to a more standard page display and interaction icons.

The move to increased international adoption of the W3C web accessibility standards is also driving more accessibility into browsers and authoring tools. However, the challenge for government webmasters and information technology managers is to keep up with the technology in order to adopt and implement the best levels of accessibility available.

The increased adoption of universal design or design-for-all principles within the usability community is also a boon for accessibility as it leads to designs that are usable by all people to the greatest extent possible. Unfortunately, in times of economic downturn and budgetary constraint, these principles can be relegated to the back seat by a perceived need for expediency and cost-cutting. Such small short-term gains lead to long-term inequities and inefficiencies in the implementation of e-government.

**Accessibility of web and software applications**

WCAG1.0 has been a W3C Recommendation since 1999 and heavily reflects its HTML origins. The WCAG2.0\(^\text{17}\) accessibility guidelines (under development) have adopted a universal design approach at their highest level. They are based on technology-independent design guidelines. Technology-specific
layers and solutions are being developed with provision for these new guidelines. WCAG2.0 is expected to be ready for adoption in 2005.

In addition to the W3C work and WCAG, other groups have developed guidelines for specific purposes and to complement the web accessibility guidelines from the W3C. For instance, IMS Global has developed a set of guidelines for educational software developers (IMS Global 2002).

Several countries have developed software accessibility guidelines; and companies such as SUN, IBM and Microsoft have also developed accessibility guidelines for their various software platforms (see Attachment 2). Other developers, such as Macromedia and Adobe, have also taken accessibility seriously in the latest releases of their flagship products. However, an issue for these later two companies is the lagged adoption of the corresponding ‘players/readers’ and, in common with most software developers, the lack of knowledge that developers have of accessibility issues and techniques.

The accessibility of software applications is particularly important for e-government from the perspective of government workers, who may have disabilities or impairments, supporting the delivery of e-government behind the scenes.

**New web technologies**

Many new web technologies increase the capacity for delivering accessible e-government in Australia. Many of these technologies, based around XML, provide for the ultimate separation of content and interactivity from presentation of the information. XML itself is being incorporated into many document and content management systems and will allow for one content source to be rendered in many different ways – from web to voice to print to Braille.

Some specific developments under the XML environment that have the potential to improve accessibility include Scalable Vector Graphics (a new graphics language) and XForms (a new forms language).

Other newer technologies include more sophisticated back-end environments that are the real enabler of e-government. These back-ends need to be teamed with accessible front-end technologies, such as Cascading Style Sheets.

One important role for government is to support the piloting of new technologies in real business or government environments to speed up their adoption. The Information Technology Online program is one example of where this is being done.

While these new technologies have the ability to improve accessibility, they still depend on the understanding, skill, and commitment of the developer, and the desire of the business owner to create an inclusive product.

**Developments in mainstream interfaces and assistive technology products**

As mainstream products focus more on user needs, options for customisation have improved:

- Options that allow users to focus on a restricted amount of information are common, reducing complexity for people with cognitive impairments and learning difficulties, and for people using assistive technology.
- Many applications explicitly allow users to change the way the interface is presented, while others will accept user style sheets, allowing font sizes and colours to be customised.
The Windows XP and Apple OS-X operating systems incorporate limited voice output options and screen magnification. The latest Adobe reader for PDF files also incorporates a voice output option and a text enlargement option. However, these options currently have limited functionality and, consequently, limited utility.

Assistive technology products are also getting more sophisticated and capable:

- they are providing better support for web content that conforms to W3C standards
- user controls are enabling significant customisation in operations
- assistive technology is able to work with a much wider range of applications and formats.

However these enhancements come at a cost. Assistive technology products remain expensive, and the increased functionality that greatly helps power users, also increases training time and complexity and makes the product more difficult for many people to use. Some new assistive technology products are taking a different approach to try to simplify demands on the user.

**Government activity**

Within Europe, the EuroAccessibility organisation is endeavouring to harmonise adoption of the W3C accessibility standards and techniques for assessment of accessibility across European governments. In addition to working with the European Union, they are working with the W3C Web Accessibility Initiative and the European arm of the International Webmasters Association/HTML Writers’ Guild.

The United States Government’s s.508 Federal Acquisition Regulation is ensuring accessibility is built into development of e-government. It has also driven the authoring tool and content management system industries to incorporate accessibility into their products. However, the s.508 requirements are not entirely consistent with international guidelines. Particularly in the area of web accessibility, s.508 differs in some requirements from the W3C Web Content Accessibility Guidelines, which form the benchmark for accessibility in Australia, New Zealand and Europe.

The accessibility of e-government services is also being addressed in several countries in Asia. The governments of Singapore, Hong Kong and Taiwan are taking the lead, with growing interest from developers and governments in India, China and the Philippines.

**Information and communications technology accessibility procurement**

Guidelines for developing accessible information and communications technology products and applications have been available for over 10 years. But it is only in the last few years that information and communications technology companies have begun to make a serious attempt to build accessible products.

The main driver for this change was a decision by the United States Government to require all information and communications technology products purchased by government to meet stringent accessibility requirements, including detailed technical standards. The Procurement Rule (United States Government 2001) that enforces these requirements means accessible products must be purchased instead of inaccessible products, even if they are more expensive. The United States Government is by far the largest purchaser of information and communications technology products in the world, so their market power is driving change in the industry. Other governments, such as Canada, Ireland, the Scandinavian governments and Singapore, are starting to follow suit and give preference to accessible products. The Government of Canada, Assistive Devices Industry Office, has developed an Accessibility Procurement Toolkit that could provide a model for an Australian Government approach (Assistive Devices Industry Office 2003).
The Australian Government requires that agency officials must have regard to the Commonwealth Disability Strategy in their procurement decisions (Department of Finance and Administration 2002). The Commonwealth Disability Strategy, in turn, is based on the requirements of the Disability Discrimination Act. In practice, this requirement appears to have no impact on day-to-day purchasing decisions.

Until recently the Australian Government had little choice but to purchase information and communications technology that was not accessible, because there was almost no accessible product on the market. However, much of the product coming out of both Europe and North America is now meeting the United States Government accessibility requirements, so it is practical for the Australian Government to introduce stronger enforcement of the Commonwealth Disability Strategy requirements. As the Australian Government cannot plead undue hardship under the Disability Discrimination Act, failure to purchase accessible information and communications technology products and services when they are available in the market place is likely to lead to discrimination complaints by both employees and customers.

Some action is already underway. Some agencies, such as the Reserve Bank, are working to ensure that in-house software is accessible. The Inter-Departmental Committee on Flexible Work Practices is considering how changing work arrangements will impact on people with disabilities. However, this is a very small beginning.

**Priorities for moving forward**

The new Australian Government Information Management Office is charged with maximising the effectiveness of the government’s online presence and will work with agencies to improve web sites to make it easier for people to find government information online. As part of this role the Office must ensure e-government remains accessible to all – in the interests of efficiency and equity. Similar roles are played by the Office of the e-Envoy in the United Kingdom and the General Services Administration in the United States.

Governments have a leading role in developing and implementing comprehensive, forward-looking and sustainable national e-strategies (World Summit 2003b). Implementation of e-government provides an opportunity for the Australian Government to provide the lead for inclusiveness that will act as an exemplar for the other levels of governments, the private sector and other non-government entities.

Accessibility is not a ‘trade-off’ like another functionality, but fundamental to the concept of e-government. As the Forrester Report (Forrester 2003) shows, accessible design is a mainstream issue, affecting over 50 per cent of working age people. Meeting accessibility standards must become as critical to each e-government application as meeting security requirements (that is, an absolute and non-negotiable minimum).

**Require best practice accessibility**

Government departments and agencies should endeavour to meet current best practice in accessible design in all e-government services, unless it can be demonstrated that this is not possible.

This approach is similar to, but better than, that adopted by the United States Government’s s.508 Regulation, under which agencies are required to purchase information and communications technology that is accessible unless they can show there is no accessible product that meets their business needs. The current Australian approach, under existing Australian Government guidelines, of specifying minimum requirements, but exhorting higher levels of conformance, is not delivering accessibility that is sufficient to meet the needs of e-government.
**Provide multiple delivery channels**

Alternative delivery channels for people who can never use the most common or preferred channel are critical components of e-government solutions.

The principles of universal design (‘Design for All’ as the European Union characterises it) underpin accessibility and widespread usability. However, no one-design solution can include every person and every circumstance. Consequently, e-government solutions must include alternative delivery channels for people who can never use the most common process. These alternative delivery channels can also benefit any users who are temporarily unable to use the main e-government channels (for example due to power failures or system breakdown, or due to a user’s temporary impairment).

**Ensure the end-to-end process is accessible**

Accessibility must be addressed for the whole end-to-end process. If any link in the delivery chain fails on accessibility criteria, the whole process becomes inaccessible for some.

This is particularly critical where parts of a process are delivered by different organisations. For example, Centrelink payments require the recipient to have a bank account, which will be managed by a private organisation. Consequently, government accessibility policies or procedures must apply to non-government organisations that supply components of an e-government service.

**Enable and facilitate user control of interfaces and interactions**

User control is a critical aspect of accessible design. If users are unable to control the user interface, and timing and method of interaction, they will be unable to participate effectively in e-government.

Unlike traditional government communication, where control was in the hands of the government publisher, e-government requires interaction, so user control over all aspects is important. This includes the appearance and control of the interface as well as control over the timing and method of interaction.

**Introduce accessibility procurement rules**

An effective regime for information and communications technology procurement must be established to ensure preference is given to accessible products and services, even where the initial purchase of these is more costly. This is a prerequisite to ensuring e-government is inclusive.

This is vital for both employees with disabilities and users of e-government services. The experience of the United States Government is that any additional higher purchasing costs are far outweighed by long-term savings in the cost of making reasonable adjustments for employees with disabilities and providing alternative means of access for e-government customers with disabilities.

**Ongoing quality assurance is critical for accessibility**

Accessibility needs to be incorporated within a strong ongoing quality assurance system to manage dynamic e-government services. Citizens will be discouraged if services are accessible today, but not next time they need to use them.

A quality assurance system should include frequent automated testing and regular, comprehensive combined manual and automated testing.
Investigate an accessibility certification scheme for designers and developers

The skills needed to build accessible e-government services should be part of the core competencies of software and web developers. The feasibility of an accessibility accreditation scheme for web and software designers and developers should be determined.

These skills are not adequately taught in tertiary information technology courses so a post-graduate certification scheme should be considered. This will give government business managers confidence that the contractors or staff they employ have the skills to meet the government's obligation to be accessible to all citizens. The British Web Developers and Marketers Association is currently investigating such a scheme. The Victorian Government has also considered the feasibility of some kind of certification of accessibility skills.

Research needs of people with disabilities with respect to error feedback, security and privacy advice

Research is needed into the most effective way in which to manage online privacy, security and error feedback issues for people with disabilities, particularly for those using assistive technologies. This is critical to encourage full participation in e-government.

The limitations of assistive technology makes it difficult to ensure that people with disabilities have a level of confidence in privacy and security arrangements that is equivalent to that experienced by people without disabilities. Interpreting and responding to error messages is also problematic. Some security solutions impose significant accessibility barriers.

Promote adoption of best practice accessible web technologies

The Australian Government would ideally promote adoption of accessible web technologies throughout the Australian economy. There will be a lot of frustrated citizens if they can participate in e-government but are prevented from participating in other aspects of the online economy.

As a purchaser, the Australian Government could insist on use of standards compliant applications. Through the use of innovation and seed funding the Australian Government can encourage development and deployment of accessible technologies. Programs such as the Testing and Conformance Infrastructure Program and the Information Technology Online Program have provided funding that encourages Australian industry to adopt accessible web technologies, but much more is needed.
Attachment 1

**Equity and access: who benefits?**

Accessible design of web sites and online services benefits a wide range of people.

**Forrester Research**

A recent study by Forrester Research, on behalf of Microsoft, estimates that:

- 60 per cent (101.4 million) of working-age adults in the USA are likely or very likely to benefit from the use of accessible technology
  - 38 per cent (64.2 million) of working-age adults are likely to benefit from the use of accessible technology due to a mild difficulties and impairments
  - 22 per cent (37.2 million) of working-age adults are very likely to benefit from the use of accessible technology due to a severe difficulties and impairments
- 57 per cent (74.2 million) of computer users, aged 18 to 64 in the United States, are likely or very likely to benefit from the use of accessible technology due to experiencing mild to severe difficulties or impairments. The research showed that:
  - approximately one in four (25%) computer users have a visual difficulty or impairment
  - nearly one in four (24%) computer users have a dexterity difficulty or impairment
  - one in five (20%) computer users have a hearing difficulty or impairment
  - somewhat fewer computer users have a cognitive difficulty or impairment (16%), and few (3%) have a speech difficulty or impairment.

**Australian statistics**

There has been no research in Australia equivalent to the Forrester study in the United States. However, there are some useful statistics.

**People with disabilities**

The Australian Bureau of Statistics (Australian Bureau of Statistics 2000) estimates that, in 1998, 3.6 million Australians had a disability, comprising 19.2 per cent of the population. The primary disabilities reported were:

- vision impairment – 34 per cent
- physical – 20 per cent
- hearing – 11 per cent
- psychiatric – 5 per cent
- acquired brain damage – 5 per cent
- intellectual – 4 per cent
- speech – 3 per cent
- other – 18 per cent
**Older Australians**

Older Australians (over 65) comprised approximately 12.7 per cent of the population in 2002. This is expected to rise to 25 per cent by 2042 (Department of the Treasury 2004. Mild and severe impairments are strongly associated with aging, so this demographic change will significantly increase the number of e-government users who require accessible design.

**People with temporary impairments**

In addition to people with long term impairments or disabilities, a significant number of Australians are experiencing a temporary impairment. Reliable figures are not available, but Access Audits Australia estimates that at any one time up to 15 per cent of Australians will be suffering a temporary impairment as a result of injury or illness.

**Other groups affected**

The solutions that address accessibility issues for people with impairments or disabilities can also address some problems experienced by other groups in the Australian community. These include:

- people using public access technology or old equipment
- people whose first language is not English
- people who have only low bandwidth access
- inexperienced or unconfident computer users.
Attachment 2

Web and software accessibility guidelines

Below is a sample of the guidelines and techniques documents that are available to assist developers ensure their products are fully accessible.

Accessibility and Macromedia Flash MX 2004


Designing for Accessibility (from Java Look and Feel Design Guidelines 2nd ed.)

How to Create Accessible Adobe PDF Files Booklet


Microsoft Accessibility for Developers

Microsoft Active Accessibility (MSAA) Overview


Section 508 Tutorial Developing Accessible Software

Sun Microsystems Accessibility <www.sun.com/access/>.

Techniques for Web Content Accessibility Guidelines 1.0 <http://www.w3.org/TR/WCAG10-TECHS/>:

- Core Techniques <http://www.w3.org/TR/WCAG10-CORE-TECHS>.
- HTML Techniques <http://www.w3.org/TR/WCAG10-HTML-TECHS>.
- Style Sheet Techniques <http://www.w3.org/TR/WCAG10-CSS-TECHS>.

TRACE - Application Software Design Guidelines

Use JFC/Swing to build accessibility into your Java applications

Web Content Accessibility Guidelines 1.0 <http://www.w3.org/TR/WAI-WEBCONTENT/>.
References


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(Document WSIS-03/GENEVA/DOC/0004, 12 December 2003), Geneva,
<http://www.itu.int/dms_pub/itu-s/md/03/WSIS/doc/S03-WSIS-DOC-0004!!MSW-E.doc>,

World Wide Web Consortium 1998, Extensible Markup Language (XML) 1.0,

World Wide Web Consortium 2001, Scalable Vector Graphics (SVG) 1.0 Specification,

World Wide Web Consortium 2003, Inaccessibility of Visually-Oriented Anti-Robot Tests,


Notes
1 Adapted from Forrester, 2004.
2 Online learning could be considered to be within the definition of e-government, but it is much wider than government. Consequently this paper does not focus on the particular issues of e-learning.
3 FCA 112 NSW District Registry, N707 of 2000, see
4 The Web Content Accessibility Guidelines allow for conformance at three levels (A, Double-A and Triple-A), with Triple-A being the highest level.
5 Coty University, London
6 A range of accessibility guidelines and techniques documents is listed in Attachment 2.
7 Web Accessibility Office, Industry Canada, <http://www.web-4-all.ca/>
8 IBM is developing ViaScribe in partnership with St Mary’s University, Nova Scotia, Canada: see
9 This discussion on accessibility issues with IVR systems is based on personal conversations with Tim Noonan, Royal Blind Society of New South Wales.
10 Australian Bankers Association, Industry Standard - Automated Telephone Banking, 2001,
11 AS/NZS 4263:2003: Interactive voice response systems – User-interface – Dual tone multi frequency signalling,
13 The material in this section is based on the practical experience of the Web Accessibility team at the National Information and Library Service. This team has worked on nearly 200 accessibility reviews and design consultancies over the past four years and runs training programs around Australia for more than 300 web and software developers, and corporate communications managers each year.
14 Skills.net Victoria <www.skills.net.au>. Similar programs exist in other states.
16 Australian Communications Exchange <www.aceinfo.net.au>.


See, for example, Freedom Box <www.freedombox.info> and Web-4-All <www.web-4-all.ca>.

<www.euroaccessibility.org>.


The Nordic Guidelines for Computer Accessibility were first published in 1993; see <http://trace.wisc.edu/docs/nordic_guidelines/nordic_guidelines.htm> for the current version.
