CHAPTER 11

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

1. INTRODUCTION

Governments have a responsibility to keep their citizens informed on its policies, programmes and services. To communicate effectively and to make government information accessible, governments have to use every opportunity to disseminate information, using delivery media and technology as effectively and efficiently as possible. The South African government embarked on a number of initiatives with regard to the electronic dissemination of information, one of which is the development of government websites. At the time of this research, there were 36 national and provincial government websites, while the *SA Government Online* website was developed to serve as a gateway or entry point to the information on these sites.

The main objective of this research, as defined in chapter one, was to contribute towards improving the quality and usability of government websites to enhance the effectiveness of online information and service delivery by the South African government. To reach this broad objective, the research assessed the effectiveness and usability of the *SA Government Online* website in detail, and South African national government websites in more general terms with the aim of identifying issues that the government will have to address to improve the effectiveness and usability of these websites, so to ensure that they contribute optimally to online information and service delivery.

This chapter provides a summary of the research methodology used to evaluate the websites and of the main findings of the evaluations. The author also makes recommendations about aspects government could attend to in order to improve the quality of government web publishing in South Africa. Lastly, some areas for further research within the area of this thesis are identified.

2. EVALUATION OF *SA GOVERNMENT ONLINE*

2.1 Evaluation methodology

The development of a methodology to collect relevant data concerning the usability of the *SA Government Online* website and users' attitudes towards it, was done in three phases: the identification of assessment criteria against which the website could be measured, the selection of suitable evaluation methods, and the development of test instruments for data collection.

The selection of assessment criteria was done by firstly identifying general criteria for the evaluation of websites. These were edited, synthesised and consolidated, ultimately resulting in a criteria list of five broad categories and 17 sub-categories. Thereafter, the author identified guidelines and principles relevant for government websites and for portal websites. This process resulted in a general framework for the electronic dissemination of information and for government web publishing within which the website could be evaluated.

The general criteria demonstrate that the crucial element of an effective web presence is content that is comprehensive, current, of high quality and authoritative, that is well written, caters for the need of a wide range of audiences, and which fulfils the publishing institution's communication and information dissemination objectives. Furthermore, the criteria demonstrate that good website content should be enhanced by developing a site that is easy to use, offers easy and intuitive movement through the site, and where information is easy to find through both browsing and searching behaviour of users. Lastly, the criteria provide guidelines for achieving a visually attractive look and feel that does not distract from the content, but enhances information and service delivery through visual and functional continuity, graphic design and typography, and a careful systematic approach to page design. Requirements for government websites encompass specific requirements for content to be available, for sites to be convenient and easy to use and to be aesthetically pleasing. Another important aspect that emerged was the need for a 'whole-of-government' approach to any government's web publishing effort, and the importance of such an approach for improving the efficiency and quality of government websites overall.

While the author attempted to provide a comprehensive overview of guidelines, it is important to realise that a single website will not necessarily have to conform to each of

them, as the purpose, audience, content and approach for sites differ. A good website will be a combination of good practices that will work for that particular website.

The research indicated that the criteria and guidelines represented a comprehensive and workable list suitable to address the research objectives. They offer in the first instance a model for good usability principles for the development of any website, and this list (or a shortened version thereof) can be used as a checklist against which a website may be measured to determine its compliance with general usability requirements. In the second instance, the guidelines for government websites as presented in chapter five provide a framework against which government websites may be developed and measured, and are a particularly valuable guide for content and some of the architectural issues that should be addressed on government websites.

After selecting the criteria, the evaluation methods were identified, selected and developed. The goal was to assess if the website complied with content requirements, to determine whether users could find the information they required, which aspects of the interface were good and which were bad, where the major difficulties were, and how the design could be improved. To ensure comprehensive data gathering on the effectiveness and the usability of the website, multiple methods were chosen. The intention was for the methods to supplement each other, so that their advantages and disadvantages could complement each other. The test instruments were based on the criteria and guidelines identified during the first step. The evaluation methods chosen were a heuristic evaluation by experts, a critical evaluation of the website by the author, user testing and an online survey.

The research indicated that the four methodologies used were generally successful for the purpose of this research. The combination of heuristic evaluation methods with the user test and the online survey provided comprehensive findings with regard to all criteria considered, identified major problems with the interface as experienced by 'real users', and provided valuable insights with regard to users' perceptions of the website. Since all four methods revealed most of the deficiencies of the website, there were definite areas where the findings of the respective evaluation methods confirmed each other. However, in some cases findings reflected the view of one or some of the respondents or evaluators, or one or some of the evaluation methods. Most of these aspects are relevant concerns and deficiencies, and, together with the issues identified by two or more evaluation methods, should be regarded as aspects that ought to be considered for the improvement of the website.

2.2 Findings for the evaluation of *SA Government Online*

The evaluation was conducted during the period 14 August – 16 September 2000. The findings indicated that many aspects of the website were satisfactory and that in the whole, the website fulfilled its purpose. However, the findings also revealed that the website did not conform to various usability criteria and to expectations for government websites in each of the broad areas of usability criteria applied, and that the website did not sufficiently provide users with a mechanism to optimally find all the information they needed.

Important aspects identified for improvement were comprehensiveness and currency. The findings revealed that both the breadth and the depth of information were not satisfactory and that the currency of the site did not meet expectations. The handling of the *What's New* feature on the website was also strongly criticised.

The findings further revealed that important aspects contributing to difficulty of finding information were illogical organisation of information, fragmented presentation of information, and because the site did not optimally provide access structures according to users' mental models of information organisation. This resulted in information that was hidden and difficult to find, and in users not finding information where they expected to find it. The findings demonstrated that the organisation structure also had an effect on the overall navigation structure of the website, as an illogical and inconsistent organisational approach will necessarily influence the navigation approach and consistency thereof.

The research indicated that the search mechanism played a prominent role in those users who normally preferred to search not finding the information they needed. The difficulty of finding information could also be attributed to the situation where users, because they found the search engine difficult to use, were compelled to browse to find information that would under normal circumstances be more logical to search. Lastly, design aspects were generally satisfactory, but findings showed that attention would have to be given to developing a clear and simple interface.

3. AUDIT OF NATIONAL GOVERNMENT WEBSITES

The findings for the evaluation of *SA Government Online* indicated that respondents had a negative perception of the standard of government web publishing in general. There was a need for provincial and national government websites to have a more standardised approach towards content, navigation, design and options of finding information.

During February/March 2001 the author co-ordinated a national government website audit (South Africa, GCIS, 2001) with the objective of investigating the validity of above-mentioned perceptions. The audit made use of a shortened version of the criteria used for the evaluation of *SA Government Online*, and was conducted by means of the heuristic evaluation method. The purpose was not do a comprehensive evaluation of all deficiencies on all government websites, but to make a general assessment of their effectiveness in providing access to government information, to determine the general problems experienced with government websites, and to determine if these conformed to that found for the *SA Government Online* website. The audit was therefore not conducted in the same level of detail, but was a more overarching overview of the status of government websites.

It was clear from the findings that although the majority of South African government departments had started to embrace the Internet for information dissemination, government websites generally did not conform to the basic principles of good website design.

Inadequate and uneven information provision as well as lack of currency of websites contributed to insufficient access to government online information. Websites also varied significantly in the extent to which information was made available – there was a disparity with regard to the breadth as well as the depth of information. Furthermore, strong emphasis was placed on the presentation of departmental organisational structures and activities, in contrast to the presentation of projects and programmes and value-added features such as FAQs, site maps, indexes, interactivity features, etc. Some government departments had started to provide their services online, but they were still far from becoming true online service providers at the time of the audit.

Another important concern was the difficulty users experienced in finding information. Contributing factors to this included all aspects audited, from the unavailability and lack of currency of information, poorly planned information architecture and navigation schemes, to the design and layout of pages. The lack of consistent design and organisation of information across government websites contributed to the lack of coherence and unity in the national web system.

It was interesting to find that when the findings of the government website audit and that of *SA Government Online* were compared, the more overarching analysis of the audit returned similar results to that of the more detailed evaluation of *SA Government Online*. The author thus concludes that South African government websites in general would in all

probability have problems similar to those identified for *SA Government Online.* One may also conclude that using a comprehensive and well-thought out checklist of usability criteria developed particularly for government websites may identify many deficiencies and usability problems. However, the author wants to stress that this should always be complemented with other evaluation methods, the choice of which will depend on the specific purpose of the evaluation and the stage of the usability engineering life-cycle. The advice of Nielsen (1993:165), that testing real users is the best way to determine usability of a website should always be taken into account.

4. CHALLENGES FOR SOUTH AFRICAN GOVERNMENT WEB PUBLISHING

The research demonstrated that much still has to be done to have government websites that are professional, usable, effective and which are effectively sustained. It also demonstrated that the challenge to improve South African government web publishing falls into three broad groupings of activities, namely

- improving the content, architecture, navigation and design of websites developed by individual government institutions
- improving the quality and effectiveness of the *SA Government Online* website as a gateway or portal to online government information
- developing and implementing overarching mechanisms in government to ensure co-ordination and a uniform approach to government web publishing in South Africa.

4.1 Improving websites developed by individual government institutions

The findings of the government website audit demonstrated that there was a need for government websites to improve considerably with regard to the content, information architecture, navigation, search and the design thereof. The findings indicated that the main challenges for the improvement of South African government websites are the following:

- The research indicated that government websites did not optimally use the opportunity to disseminate comprehensive information to their audiences. Websites should become more comprehensive government information repositories, including at least the minimum content as suggested in chapter 10, as well as any other information emanating from government institutions. In addition, other typical elements of stage one of e-government – information publishing – such as providing information on services provided by government, contacts for further assistance, and electronic encyclopaedias to reduce the number of telephone calls to employees, should be readily available.

Government must become more responsive to the public's needs by providing as many as possible of its services online. Websites should also provide the public with the facility to transact with government.

- The improvement of the currency of government websites should be a priority. As government websites contain rapidly changing information, care should be taken so that the most current information is posted as soon as possible after it becomes available – the web should be made the first place to publish information, not the last. Outdated material should be removed, and government institutions should make better use of the opportunity to post government news and comments, and government's reaction to key issues relevant to the institution.

- Government sites should rely less on the posting of official documents and media statements and make optimal use of the web as medium. Existing documents should be re-written for the web and the writing style should be more informal and suited to the Internet. Long documents must be organised to be suitable for online reading.

- Most government websites should be improved to make content easier to find and to reflect the needs of the audience rather than the departmental structure. Furthermore, one of the major problems with regard to navigation, clicking through too many layers of the website before finding information, should be improved by making sub-categories more transparent to users.

- Technology should be exploited to ensure democratic outreach and to comply with the requirement of two-way communication between government and the public. The ability to communicate with appointed and elected officials may make the difference between passive information delivery and a site that provides dynamic interaction. Digital democracy in various forms should be extended and made more prominent on government websites, and forms should be available for this interaction.

- Government departments will have to manage their websites as they do any other strategic resource. According to the Canadian government's Internet guide (Canada, Treasury Board, 2000b) a dedicated and skilled team to create, maintain and operate the web initiative is critical to the success thereof. This team should carry the initiative from the planning stage to the implementation, evaluation and maintenance stages, and should draw on the expertise and enthusiasm of a broad cross-section of the institution's members. Ideally such a team will include a project manager, staff from

corporate communications, information management and information technology, content providers to write and approve material, and staff to maintain the newly published content.

- New and present web developers will have to attain the skills and expertise in the subject domain, HTML, XML and related web technologies, graphic design and usability.

4.2 Improving the quality and the effectiveness of the *SA Government Online* website as a gateway or portal to online government information

The goal of the *SA Government Online* website as official entry point to South African government information on the Internet should be to provide a wide range of government information in such a way that is easily accessible to users. Although the evaluation findings indicated that the website achieved this goal to a great extent and that it contained many positive features contributing to the overall accessibility of online government information, it also pointed to issues of concern, as certain aspects of the website returned markedly lower satisfaction levels or less positive results. The author believes that it should be an important priority to improve the aspects that rated less positively in order to meet the high expectations for the website and to match the aspects that rated positively.

The research demonstrated that government faces the following challenges in optimising the concept of one-stop delivery to include all the needs and interests of all potential audiences.

- The author stated in 2001 (Korsten, 2001:157) that the *SA Government Online* website was developed by the GCIS as an individual 'bottom-up' attempt when the department saw the opportunity for making government information available over the web. Government will have to review the way this project is being managed and co-ordinated to ensure that a 'top-to-bottom' approach is being followed and that there is optimal co-ordination between departments and government bodies to ensure that it is comprehensive and up to date.

- When all government information and services are online, the spectrum of information and services will be substantial. As the official entry gateway, *SA Government Online* should form an essential part of government's strategy for providing comprehensive access to all online information and services. This means that the website will have to

be enlarged to provide access to government information and services not provided at the time of the research.

- At the time of the evaluation *SA Government Online* carried links to information on government websites as well as content itself. The latter caused duplication of information available on other sites. This resulted in inaccurate information, as it is difficult to keep track of all the changes made on government sites and then to replicate these on the *SA Government Online* site. Government should re-evaluate the role of the website with regard to linking and/or carrying information content itself. It is the view of the author that the prime strategy for the website should be to create easy access to all online government information, and that the website should carry the value-added content that is not the direct line-function responsibility of a specific government department.

- During the evaluation it became clear that the expectation for current material was not always met. The web developers will have to ensure that currency standards and expectations are continuously met. More frequent updates are important for attracting traffic to the website.

  As suggested for all government websites in the previous paragraph, improved management practices should also be implemented for the daily maintenance and updating of *SA Government* Online. Criteria for the inclusion of new pages will have to be developed so that they meet quality and usability requirements. Furthermore, establishing the accuracy of all posted information requires that it be approved at multiple levels, but for timely content delivery the approval process should be short and easy to implement. To ensure that the website reflects up-to-date and accurate information, content providers must regularly make changes. Material must be displayed only when it is current, and must be removed when it becomes out of date. It is recommended that each page or related group of pages on the site have a content owner. This person or unit should have an ongoing responsibility for ensuring the currency and accuracy of the information on those pages and for testing changes and updates before they are implemented. There should also be an editorial board – to ensure that content is presented consistently on the website, that priorities for changing or adding content to the site are set, to identify useful links to new or changed content, and to ensure that policies and standards governing web use are consistently applied.

- The size of the website will make it difficult for all updates to flow through one or two people. It is thus recommended that an effective content management solution that properly addresses the requirements for this site's functionality, size and scope be acquired. According to McClusky-Moore (2000) the right solution can provide the scalability, flexibility, and interoperability necessary to meet future site requirements, save time and money and improve communication. In addition to timeliness, the content management solution should control cost and address the quality of content, consistency of site design usability, and interoperability with the developing organisation's other business systems.

- The search engine should offer users enhanced searching capabilities. It should provide for simple and advanced searches, for more options for constructing and redefining queries, for clustering of results, and for scoped searches on particular sections of the website, e.g. contact information. It should also be simpler and easy to use for both experienced and inexperienced users. In addition, the search mechanism should be extended to allow users to quickly search and access information on all government websites. Providing such a facility will allow users to find information they need regardless of which government institution produced it. Easy-to-follow instructions for conducting effective searches need to accompany this feature.

- While it is recommended that the search engine be improved, it will be as important to provide optimally for browsing behaviour. From observations of user behaviour it is clear that one cannot rely only on search as a mechanism to lead users to information. The redeveloped website should continue to allow for browsing, but should implement improved access methods. To optimally serve as a one-stop access point for all government information and services it should be re-organised to make it easier to find the information and services of all government institutions, even when the name of the department or government body is not known. In order for users to effectively deal with the large number of South African government institutions, the website also needs to be organised by function of the service. The website might for example follow an approach where common services are clustered together, and/or according to the government clusters. The author wants to re-iterate the sentiment of Atkinson & Ulevich (2000:18) that "a portal needs to be more than simply a mega-link to government websites. Rather, it needs to completely bypass agency stovepipe organization and be organized by information and type of interaction" (Atkinson & Ulevich, 2000:18). Furthermore, a user may want to locate the page of a specific agency or branch of government, but not know exactly what the agency is called. According to Lutkenhaus (2000) it is easier in

these cases to use an index, scrolling through the subsequent listing of sites, looking for the agency and branch of interest.

- The website should also include value-added features so that users may find overarching government information more easily. Among these features are FAQs and the syndication of data from various content owners to a central database or databases. An example of last mentioned is a searchable database of telephone and e-mail contact information for government officials in various departments that allow users to look up organisational contacts for a specific government service. Additional features may be considered to assist users to form a mental model of the website and to improve their understanding of the structure thereof, for example a site map, alphabetical index and other organisatonal and navigational tools. These will assist users to find information easily and quickly. In addition, the development of metadata in support of the integration of information should be implemented on the *SA Government Online* website.

- After implementation of the new website it will have to be continuously monitored to ensure that it conforms to standards and in order to improve it. According to the Canadian web guidelines (Canada, Treasury Board, 2002b), this step is a crucial part of creating, launching, and maintaining a successful site, since it "lets you see how well you have planned your initiative and presented information and services to your clients". Continuous evaluation must also ensure that the website is in step with developments in information technology and with users' IT resources, as well as with as many users as possible (Clausen, 1999:85).

  User needs should be reviewed continuously and should be met. In line with the Canadian Internet guide (Canada, Treasury Board, 2002b), the author recommends periodic client surveys of the site to be used to assess users' views on the accuracy, reliability, accessibility, ease-of-use, and content quality of the site and to get ideas for improvement. Monitoring Internet user and discussion groups pertinent to the institution's business, as well as coverage of the institution's website in print and electronic media is also recommended.

- A factor that marred positive perceptions of the website was inconsistency in various aspects of the website. The author is of the opinion that many aspects criticised in this regard were as a result of oversights by the web developers. It is therefore

recommended that the redevelopment of the site be done according to a pre-determined, standardised style.

- According to Carton (1998:22), the convergence of a rapidly growing, inexperienced audience and government interest, together with faster computers and new technologies, will result in the web a few years from now looking differently from what we have today. When redeveloping and improving the website, this will have to be kept in mind. The evaluation was done on the premise that the user population of the site consisted of people with at least some Internet exposure. However, in future the website will also have to provide for inexperienced users and users in rural areas, as it can be expected that they will form an important part of the website's user population for a considerable time to come.

It is important to remember that a website is a complex combination of various aspects and that the right relationship between different web design aspects will contribute to a successful and usable site for all relevant users. Providing quality content should be the ultimate objective of this website. It must always be kept in mind that the presentation might distract from the content when not done correctly, for example when aspects such as confusing navigation and information architecture are present on a site, or when excessive graphics make it difficult for users to pay attention to the content. There must be a positive correlation between the organisation and design of a website and the reliability of content. When considering proposals offered here and in chapter eight, it is important to bear in mind that they need not be implemented exactly as suggested. What is important is that a logical cohesion is achieved between the aspects that are implemented. According to Gordon (2000), the end solution often reflects a compromise between all site concerns. Management and strategic decisions about the purpose and audience of the website should determine the best approach with regard to the content, information architecture, navigation, search and aesthetic appeal.

SA Government Online should be one of the centerpieces of the South African government's e-government strategy. Eventually, the site should be, as Hosking (2000) requires for the *New Zealand Government Online* website, "the one people will want to go to if they want to interact with government, be it a policy document or to get a dog license".

4.3 Developing and implementing overarching mechanisms in government

Improving government websites requires more from government than just the application of technology and improving websites on an individual basis. Providing government information and services online is a challenge that faces not only individual government institutions and web developers, but also government as a whole. Government will have to develop an integrated approach to web development within the broader framework of its e-government initiatives and create an environment conducive to the development and implementation of quality websites. Initiatives in this regard may include the following:

- Policies and strategies for electronic information dissemination, for an integrated information technology infrastructure, for integrated information and technology management, and for improving access to new technologies – including access mechanisms and electronic service delivery channels – should be developed and implemented. In addition, policies and strategies will have to take a government-wide perspective on managing government information and will require adopting coherent and compatible information policies in support of better decision-making and better and co-ordinated service delivery.

- While it is important for each government website to reflect the character of its department, South African web publishing would benefit from a more standardised approach. There is a need for some level of consistency and conformity between South African government websites to assist users to find information. The author believes that many of the problems identified during the evaluation of *SA Government Online* and the audit of government websites could have been avoided if web developers had guidelines to assist them in planning and developing their sites.

  Creating a common look and feel for an extended family of websites holds enormous challenges. To guide new and inexperienced web developers, and to ensure that government websites develop a feel of coherence and unity, criteria and guidelines for government web publishing should be made available to government web developers. This could be effected by compiling a comprehensive web guideline document which provides minimum standards and which guides web developers in all aspects of web development, from proper management of a website, through content development, planning an information architecture and navigation scheme, to the professional design of a website. A model for such a guideline document is presented in chapter ten.

Government should be in a position to enforce standards and requirements on government departments and bodies. However, to gain maximum benefit, the standards and requirements should be kept to a minimum and reflect key areas on which consensus has been reached. It is also vital that concept guidelines are consulted and negotiated amongst the broad spectrum of role-players involved in government web publishing, especially in areas where guidelines and standards are specified. This will contribute to them taking ownership of the final guidelines, making implementation thereof less problematic. In addition, government websites should be evaluated or audited against these standards and guidelines on a continuous basis. The e-government office should appoint institutions responsible for this.

- It is important for a government to have an effective identification system for information assets. An important initiative should be the development of a metadata framework for South African government websites. The Dublin Core standard is the leading international standard for online resource recovery (Australia, National Archives, 2000), and might be applied in a resource discovery framework (RDF). Among the key benefits of using a systematic way of assigning and structuring metadata are that it enables search engines to find relevant documents, it provides identifying information, and it provides a list of what information government holds. It also contributes to consistency and interoperability (Canada, Treasury Board, 2002b).

  Government institutions may also consider metadata tagging offline resources, which will then be available for searches. In this way all the services and information of that institution can be identified and discovered in the online environment.

- Government should identify a candidate set of government services for electronic delivery by identifying commonly requested government services and prioritising those to be implemented first. Thereafter the rest of the services can be implemented online. Government should also ensure that planning and implementation of public service delivery mechanisms (Batho Pele) (South Africa, DPSA, 1997) take cognisance of developments in information and web technologies, so that online service delivery may optimally serve the public. As and when new and improved services are developed, they should immediately be reflected as part of electronic service delivery activities.

- To optimally provide e-services in a secure and safe environment and to optimally establish user confidence, government needs to address the aspects of privacy, security and authenticity of its web servers.

- A skills audit should be conducted within government institutions to determine the capacity and skills needed for web development. Overarching mechanisms should then be put in place for web developers and other staff to be trained, and/or to acquire professional organisations to outsource these functions to. Guidelines should be developed with regard to the human resources and skills needed for web development, and on how to brief and manage a consultant.

- The value and importance of professional and effective websites for the dissemination of government information and services should not only be conveyed to government communicators and web developers, but also to senior managers in all government institutions, so that they can ensure that websites are managed properly and that adequate human and other resources are allocated.

- Government web publishing could benefit from the implementation of a web committee under the auspices of the e-government office. Such a body could constitute an official channel of co-ordination and communication and also act as initiating and monitoring body for web norms and standards within government. Other issues that could be co-ordinated by such a body include capacity building and training, regular 'user-group' meetings and the management of one or more discussion groups where government web developers can discuss issues of mutual interest.

- The extent to which government websites truly meet public needs is also controlled by the extent to which the public has access. Citizens and businesses in rural municipalities, for example, are still finding Internet access beyond their budget and, in some cases, expertise. Universal access to government websites is a necessary requirement towards ensuring equity of access to online government information and services. To optimally provide online information and services to all potential audiences, and to ensure that everyone will benefit from government websites, government will have to build on initiatives already being taken in the telecommunications field to promote universal access. If approached carefully and strategically, it can be part of identifying and driving fundamental changes that could improve citizen's experiences of government and can contribute towards an improvement in their general well-being (Korsten, 2001:206).

The author believes that the implementation of above-mentioned initiatives will ensure consistency, cost-effectiveness, interoperability and transparency within government, will

lead to improved accessibility of online government information, and will help ensure that online government information and services are provided at a consistently high standard, thereby contributing to users developing confidence in government's web publishing effort.

5. SUGGESTIONS FOR FURTHER RESEARCH

To utilise the full potential of e-government, the South African government should take full advantage of Internet and web technology for online information dissemination and service delivery. The following research can be considered to support government in reaching this goal:

- Information dissemination requires knowledge of users, potential users and stakeholders. Research should be conducted to gain insight into the needs of citizens and other audiences with regard to information and services, also by means of the web, and about the common needs of certain kinds of users. Research needs to be conducted not only amongst the audience that was relevant for this research (see chapter one, paragraph 3.2), but also amongst potential and future audiences, i.e. the broader spectrum of the South African population – including inexperienced Internet users and illiterate people without direct Internet access and who may use MPCCs or intermediaries to access the Internet.

- Research about the level of support for online service delivery is necessary. Studies that identify specific benefits resulting from web-based services and that produce metrics that can measure those benefits should be conducted.

- Government should initiate a government-wide skills audit to determine the level of web development skills and training in government. This can be used for planning a government-wide initiative to ensure that government institutions acquire or make use of professional and knowledgeable project managers and web developers.

- Individual government websites should be evaluated continuously in order to improve them in step with user needs and the development of new information technologies. On-going government-wide assessment of government websites should thus be conducted to determine their strengths and weaknesses and to recommend improvements so that these sites can better meet user needs.

- On-going research about good website principles and new web technologies should be conducted. The continuous evaluation and study of the websites of leading e-government countries will have to form part of this research. The government web guideline document should be adapted accordingly to ensure that it reflects the latest developments, and the e-government office or web forum should communicate these to all government web developers.

- Research is necessary to determine the optimal use and application of technologies for the dynamic updating and management of websites built on the fly from data in databases. In addition, the use of XML and related technologies should be researched to determine the optimal use and application thereof for government websites.

- Research should be done on metadata applicable for government websites, with the purpose to develop a customised metadata scheme for South African government websites.

- Methodologies to evaluate websites should be studied continuously to ensure that government web assessments are done by means of the most professional and workable methodologies. Further research may also be done with regard to the best methodology for each phase of the web usability engineering lifecycle and with regard to the combination of methodologies that will provide the best results.

6. CONCLUSION

Government information is an important resource that should be managed strategically – government has an obligation to make information available easily, widely and equitably, increasingly also in electronic format. The South African government has committed itself to a vision for e-government, and government web publishing is a key area that must conform to e-government principles. Government websites should be utilised as a tool to disseminate information and services, to communicate policies and programmes to a wide range of audiences, and should be a public relations tool to reach citizens, the media, and foreigners, including tourists and investors.

The research clearly indicated that South African government websites did not optimally fulfil above-mentioned purpose at the time of the research, and that they should be improved to address the needs of a wider audience, to communicate government news, policies, projects, programmes and events, and to provide a tool for interaction between

government and the citizen. Government websites should convey a more consistent and unified message, thematic feel and structure, and government image and branding. Furthermore, the *SA Government Online* website should ensure a user-friendly entry point that promotes virtual access to all online government information clustered according to the needs of the audience, regardless of the institution. This requires that the South African government develop an overarching Internet strategy and policy to ensure that it meets the requirements for e-government and for professional, usable and effective websites.

Formal policies in relation to web publishing did not exist at the time this research was conducted. The author, however, believes that this research may contribute to government websites conforming to broad government communication strategies, to the development of such policies, and to the improvement of government information dissemination. The selected criteria may have universal applicability for government and other websites, and may be used as a consistent standard for developing and measuring websites. The criteria also provide a foundation for further development of criteria to assess South African government websites.

The author also believes that this research provides a platform for the development of website norms, standards and guidelines for the South African government. The model developed by the author may be used for further consultation between government role-players, and eventually develop into a comprehensive set of norms and standards for government web publishing in South Africa. The ultimate aim is to provide government web developers with good web development practices, to ensure that government develop a corporate image and branding for all its websites, and to ensure that government websites are consistent, effective, accessible and usable. The research described in this study thus has the potential to maximise the public benefits to be derived from using the web as a government information channel.