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Archival orthodoxy of post-custodial realities for digital records in South Africa

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ABSTRACT

Some public entities in South Africa have implemented digital records systems over a period of 20 years. In terms of the South African archival legal framework, there is a need for such entities to transfer the records into archival custody. However, there is consensus among researchers that there is no infrastructure to ingest digital records into archival custody in South Africa. Furthermore, some public entities have migrated from one system to another since implementation and there is a possibility that records might have been lost during migration. This study demonstrates through literature review the unconscious archival orthodoxy of post-custodial realities in South Africa. The study recommends that public entities should apply for exemption from archival legislation in order to develop an interim solution for the preservation of digital records. The National Archives and Records Service of South Africa (NARSSA) is also encouraged to develop a policy on distributed custody to allow government entities to create interim solutions for preserving digital records. Both public entities and NARSSA should invest in capacity development, including training and provision of sustainable infrastructure required to preserve digital records. It is hoped that this study will influence policy-making with regard to custody of digital records.

KEYWORDS

Digital records; post-custodial; South Africa; archival legislation; preservation

Background to the problem

Although public entities in South Africa began to implement systems to manage digital records in the early 1990s, these measures have not yet translated into a systematic program of digital transfers into archival custody in a digital repository. Bak[1] identifies major components or functions of digital repositories as metadata management systems, storage location, content management systems, authentication systems and digital preservation. While the implementation of digital records management has begun, the infrastructure for ingesting into a digital repository does not yet exist. As a consequence, to avoid the loss of important digital records in the near term, interim measures are needed and it is the purpose of this paper to identify what these could be.

Among the agencies that have implemented digital records management is Rand Water, a water utility company in South Africa. This was one of the earliest public institutions to

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introduce a digital records management system in 1991 using Ghost-writer as a platform.[2] Following the implementation of the first system in 1991, Rand Water migrated to another system called File Tracking System (FTS) in 1996. The FTS was discontinued at the end of 2002 and in 2003 the company migrated all its records to a new system – Papertrail. This was followed by FileNet in 2009, which was still in use by 2016.[3] It should be noted that Rand Water was not the only government entity to implement a digital records system in South Africa. Scholars such as Kemoni[4] and Katuu[5] observed that South Africa is one of the most advanced African countries in terms of implementation of systems to manage digital records. A survey of South African institutions aimed at investigating implementation of software applications used to manage digital records revealed that, by 2010, five of the ten institutions had implemented the system for five or more years.[6]

Katuu[7] and Ngoepe[8] identify several government entities in South Africa that implemented digital systems between 2000 and 2010. These are: Department of Trade and Industry (Documentum), Department of Public Service Administration (Hummingbird), Department of Science and Technology (Hummingbird and migrated to Alfresco), Department of Arts and Culture (Hummingbird and migrated to Alfresco), Presidency (Hummingbird), Department of Cooperative Governance and Traditional Affairs (Hummingbird), Department of Environmental Affairs (Livelink) and Department of Transport (Documentum). It should be noted that all these systems were included in the panel of products evaluated by the National Archives and Records Service of South Africa (NARSSA), in partnership with the State Information Technology Agency, in 2006. The tender was due for renewal in 2008, but it was never renewed. This panel of products was known as Tender 398: Enterprise Content Management Solutions. The purpose of the panel was to enable government bodies to shorten the tender processes by procuring from the panel via a request for quotation, which is a much shorter process than other tender processes. Three classes of solutions were evaluated, that is, class A, class B and class C. From the implemented systems, those which fell in class A include FileNet, Documentum, Hummingbird and Livelink, while Papertrail was classified in class B. Therefore, in implementing the system, all the aforementioned government entities complied with guidelines issued by NARSSA.[9]

Class A solutions consisted of the following fully integrated modules: imaging and scanning; document management; digital asset management; web-content management and collaboration; records management; search and retrieval; email management and forms management. Class B solutions consisted of a core solution with the following fully integrated modules: business process management; imaging and scanning; document management; digital asset management; web-content management and collaboration; and records management. These solutions are suitable for government bodies that do not have a need for an all-inclusive functionality. Class C solutions consisted of the following modules that can be implemented as standalone solutions: biometrics and digital signatures; search and retrieval; email archiving; forms management; portal management and business process management. These products can be procured in instances where a government body already has a core solution implemented and wishes to extend its functionality.[10]

It is clear from the background given that since the implementation of digital systems in some government entities, there is a need within the South African legal framework to transfer digital records of enduring value into archival custody. The South African archives legislation prescribes that records can be transferred from the creating agency to an archives

repository after 20 years. The question is: 'What about digital records?' Technology has changed this landscape as a day's work in technology can equate to a thousand years. Katuu[11] recommends that government entities in South Africa need to address not only the challenges of managing digital records using digital system applications, but also the issues of long-term preservation in an environment where the national and provincial archives repositories do not have the infrastructure to ingest digital records into archival custody.[12]

Failure to address the challenges of managing and preserving digital records has resulted in government losing more records, as Harris[13] laments of disappearing digital records in South Africa. As a result, only a sliver of digital records have been preserved. The management of records in creating agencies cannot be considered preservation for the future, since many of these institutions do not have the capability to locate and retrieve records after a certain period of time.[14] Furthermore, employees in government entities do not have the necessary skills to preserve digital records. In practice, many government entities destroy records when the records are no longer necessary for their current needs.[15]

Therefore, in the absence of the infrastructure to ingest digital records into archival custody, it is necessary for NARSSA to enact a policy that allows government entities to develop an interim infrastructure to preserve digital records. This study demonstrates through a literature review the unconscious archival orthodoxy of post-custodial realities in South Africa. First, the study discusses a legislative and strategic framework for digital records preservation in South Africa. The discussion on the need for preservation of digital records in South Africa is provided for two reasons. As Katuu[16] would attest, studies on digital preservation of records have not been given much prominence in professional discussions in South Africa. Second, it is hoped that this study will influence policy development and implementation on digital preservation in creating agencies until such time as NARSSA develops the infrastructure to ingest digital records into archival custody. In this regard the policy of distributed custody may be desirable in South Africa as an interim solution.

The problem

It is clear from the discussion above that digital records in some public entities are ready for transfer to the national archives repository. Managing these records at the creating agency cannot be considered preservation. However, government entities face a number of dilemmas with regard to transfer of digital records into archival custody in South Africa. Harris[17] explains that until the 1980s, the South African archives resisted taking custody of digital records, instead they opted to preserve computer-generated documents in paper or microfilm format. As a result, the identification and transfer of digital records from public institutions into archival custody has not happened in any systematic manner because the national archival system has struggled to manage such records effectively and facilitate their long-term preservation.[18]

Furthermore, waiting for 20 years to transfer digital records into archival custody can be futile owing to the unstable nature of these records. By the time a period of 20 years elapses, records might be unreadable or lost forever owing to technological obsolescence. This has been the case in South Africa with the records of the Rivonia Trial stored in Dictabelt. As a result, the South African government had to resort to the help of the French government to provide technology for reading Dictabelt records. Instead, Duranti[19] advises archivists to position themselves at the beginning of the record's life cycle, take on the role of 'designated'

trusted custodian, identify the records to be preserved at the moment of their creation, assess the authenticity of the records and monitor them throughout their existence, and determine the feasibility of preservation on the basis of the archives' technological capacity.

Given the lack of infrastructure for the preservation of digital records in South Africa, almost all government entities have not transferred to NARSSA any digital record, but have kept them in their own possession.[20] The storing of these records in the public agencies cannot be considered preservation for the future, since many do not have the capability to locate and retrieve a document after a certain period of time. Furthermore, unlike NARSSA, which is mandated to preserve those records, public agency employees do not have the skills to do so. Therefore, it can be argued that NARSSA is unconsciously following a post-custodial approach as far as the preservation of digital records is concerned. As observed by Cunningham,[21] the vision of Gerald Ham for the archival paradigm shift into the post-custodial era is being realised. NARSSA requires government bodies to migrate e-records through hardware and software changes to ensure that they remain accessible. It was only since 2013 that NARSSA started with the development and implementation of AtoM and Archivematica. AtoM (Access to Memory) is a web-based software for standards-based archival descriptions in a multilingual, multi-repository environment. In 2010, NARSSA and the National Archives of the Netherlands embarked on a Mutual Cultural Heritage Programme. Mutual cultural heritage represents tangible and intangible cultural heritage related to Dutch history in foreign countries. As a result, two archivists from NARSSA were sent to the Netherlands for training in AtoM, as the software was to be used to describe related materials and share them with the Dutch archives. Following this project, NARSSA investigated the possibilities of archival management software further and, after considering all the relevant factors, decided to implement AtoM.

Archivematica on the other hand is a free and open-source digital preservation system that is designed to maintain long-term access to digital memory. The goal of the Archivematica project is to give archivists and librarians with limited technical and financial capacity the tools, methodology and confidence to begin preserving digital information today. Archivematica uses a micro-services design pattern to provide an integrated suite of software tools that allows users to process digital objects from ingest to access in compliance with the ISO-OAIS functional model. The Open Archival Information System (OAIS) Reference Model is an approved ISO standard and considered the benchmark for digital preservation systems. It is a high-level model that defines the base functional components of a long-term preservation system and the key internal and external interfaces, and characterises the information objects managed in the system. It addresses all aspects of long-term preservation of digital information: ingest, archival storage, data management, access, dissemination and migration to new media and forms. At the time of writing this article, the project for the implementation of AtoM and Archivematica was still in its infancy. As such, government entities which have long implemented digital records systems are forced to create an interim solution for the preservation of digital records.

The challenge is compounded by the fact that since implementing digital systems in the 1990s, some government entities have migrated from one product to another. For example, Rand Water migrated to three systems, as discussed above, while the Department of Science and Technology and the Department of Arts and Culture migrated from Hummingbird to Alfresco. There is a possibility that some records might have been lost during migration as audits of this process are not conducted. Government entities face the dilemma of what to do with digital records of enduring value that are older than 20 years and that are still managed

through digital records systems. Creating agencies cannot wait for 20 years to transfer digital records into archival custody, as by that time they might be unreadable or lost.

The preservation of digital records for continued access is a major challenge for archival institutions around the globe. These records are fragile owing to the high pace of technological changes resulting in obsolescence. Digital records are subject to both intentional and accidental corruption or loss throughout their existence, requiring that they be controlled under an unbroken chain of preservation.[22] Therefore, the preservation of digital records is a challenging exercise that requires appropriate preparation and strategies by archival institutions. Since the early 1990s, several researchers such as Bearman,[23] Thibodeau[24] and Hedstrom[25] acknowledged that although digital records present a number of opportunities, they also pose many problems for archivists. Hedstrom[26] argues that digital records and information systems allow archivists to perform many of the traditional aspects of archival work, while simultaneously offering the possibility for a number of new services and functions. For example, in performance appraisal, archivists could be influential in helping organisations design information systems to separate records, distinguishing between records of enduring value and those of an ephemeral nature. Furthermore, digital records can be searched more readily and lend themselves to being manipulated more easily to answer more complex queries. McDonald[27] identifies basic challenges of digital preservation as: 'physical media on which digital data are recorded, format obsolescence and technical opportunities and encoding of digital information'. These records require appropriate strategies and technologies for preservation, otherwise the records could be lost forever.

Duranti[28] contends that digital preservation encompasses the processes and controls that enable digital information objects to survive over time. Therefore, digital preservation requires a comprehensive approach that addresses considerations such as the volume of data, the numbers of records, data objects, data formats and the organisation of records. Such strategies and technologies are lacking in countries in the global periphery. For example, the Archival Platform,[29] Harris,[30] and Ngoepe and Keakopa[31] argue that in South Africa there is no infrastructure to ingest digital records into archival custody. This raises serious challenges for public organisations which are ready to transfer digital records into archival custody. The next section discusses the legislative and strategic framework for digital records preservation in South Africa.

Legislative and strategic framework for preservation of digital records in South Africa

South Africa's legal and regulatory system has a tremendous impact on how records are managed in the country's public sector. Allan[32] argues that there are two major categories of legislative instruments that relate to information management: those that control information across all public institutions and those that 'relate to specific information held in specific sectors or structures'. In South Africa, the national archives have a mandate to preserve and make records accessible, including those which are generated electronically. In terms of Section 13(2)(b)(ii) and Section 13(2)(b)(iii) of the *National Archives and Records Service of South Africa Act* (No. 43 of 1996), the national archivist shall determine the conditions subject to which digital records systems shall be managed and records may be reproduced electronically.[33] The records system in South Africa caters for two types of records – those records that will be destroyed after some time, usually before 20 years, and those that have

an enduring value and that will be preserved permanently in archive repositories after the passage of 20 years.[34] There are, however, a number of exceptions to this requirement, that is, when another Act requires the records to remain in the custody of a particular government body or person; when the national archivist, having consulted with the head of the relevant government entity, decides that the records should remain with that body, or alternatively should be transferred to an archives repository prior to reaching their 20 years of existence; or when the national archivist defers the transfer of records to an archives repository. The Act in terms of Section 11(2) empowers the national archivist to 'take such measures as are necessary to preserve and restore records'.

NARSSA's digital records preservation program is aligned with the regulatory requirements of the State Information Technology Agency and is built on the following four-pronged strategy:

- Archival involvement in the design and maintenance of digital records systems. This element of the strategy is implemented to a limited extent owing to a shortage of expertise and staff at NARSSA[35] For example, Ngoepe and Jiyane[36] report that staff members who left the employ of NARSSA were not replaced and the positions were frozen. As a result, the archival system is characterised by a high level of staff turnover. Ngoepe and Jiyane[37] also report that there was only one person who was self-trained in digital records management who has since left the employ of NARSSA. One person could not cope with the continuous research that is necessary to keep up to date with digital records management. Further challenges facing both records managers and archivists as they relate to resources are: skill levels, authority, content management systems, and the long-term preservation of digital records and how to prove their authenticity over time.[38]
- The earliest possible transfer into archival custody of digital records with enduring value. However, this is not practised as NARSSA does not have the necessary infrastructure to take digital records into archival custody.
- The identification of archival digital records which should remain in the custody of the creating body. Ngoepe and Jiyane[39] report that owing to a lack of capacity at NARSSA, the appraisal of records to enable the disposal thereof, as required under the provisions of Section 13(2)(a) of the Act, was not done effectively. For example, during the 2007–08 financial year only 19 disposal authorities were dealt with and, out of a total of 149 applications to be examined, 126 appraisals were still outstanding.
- The identification of non-archival digital records that can be disposed of as part of an office's normal administrative practice.

NARSSA also requires that digital records in the custody of government bodies be migrated to new hardware and software platforms constantly to enable them to remain accessible.[40] NARSSA requires that migration strategies be built into digital systems during design. The reason for this is that, if migration strategies are added at a later stage, it might be that:

- the format in which the records were captured does not lend itself to data interchange among different types of storage media and software applications;
- records are lost in the migration process and there may be no proper recording of what was lost;
- the migration process is insufficient because the links between documents and metadata were lost or never managed properly in the first place.

4. Possible interim solutions for preservation of digital records in government entities

After having highlighted the challenges that government entities face in South Africa, this section considers interim solutions that can be implemented. It is clear that the responsibility for preserving digital records in South Africa has been unconsciously shifted to creating agencies where many do not have the capacity to locate and retrieve records after a certain period of time. Therefore, public institutions may resort to either keeping digital records within the institution or transferring them to cloud providers.[41] Either way, a policy of distributed custody should be applied. The first approach to keeping records within the public institution is allowed by law in South Africa, but as an explicit legal exception. In terms of Section 11(2) of the *National Archives and Records Service Act*, this can be done if any other legislative instruments state that public records should remain in the institution's custody or the national archivist deems the records to be deferred from transfer or not be transferred altogether. Although this provision is stated in the legislation, it is seen as an exception to the rule which states that all public records of enduring value should be transferred to archival custody. Therefore, with regard to this option, public entities can assess the juridical environment in South Africa mapping out the legal requirements for public institutions. This will help to identify the legal options available and thereafter to consider applying for exemption from archival legislation. Once exemption is granted, the public agency can create an interim solution by developing the infrastructure necessary to preserve digital records using the OAIS reference model. Potential factors to be considered when keeping digital records with their creating agencies are: cost of transfer, technical capacity of the archives in preserving digital material, and when the creating body is able to provide users with a better service.

The second option of using cloud service providers raises several issues. For example, cloud storage tests the fundamental tenets held by records professionals, including custody, ownership, authenticity context and preservation.[42] As is the case in many countries, South Africa's legislative and regulatory instruments are still largely based on the principle of territoriality.[43]

In South Africa, for example, the *Tax Administration Act 2011* became effective on 1 October 2012. As a result, the South African Revenue Services (SARS) published a notice in the *Government Gazette* detailing the digital form in which tax records, books of account and documents are required to be maintained and stored by taxpayers.[44] One of the provisions in the notice is that tax records stored and maintained electronically must be at a physical location in South Africa. Therefore, taxpayers who store and maintain accounting or invoice records using cloud computing with servers in India, for example, must seek approval from a senior SARS official first. However, it is not that easy. The taxpayer must ensure that all the following conditions are met:

- The records can be readily accessed from South Africa.
- The locality of the records will not affect access to the digital records.
- South Africa has an international tax agreement for reciprocal tax assistance with the country where the servers are hosted.
- The form of the records meets the storage requirements in all other respects.
- An acceptable digital form of the records can be produced by the taxpayer in South Africa.

- In addition to the storage requirements, the taxpayer will also be compelled to develop a system description explanation if the software or digital platform is not commonly recognised or used in South Africa.[45]

The other concern of records professionals is the loss of legislative and regulatory control over public records held by cloud service providers. In a cloud environment where the management of content could occur in servers in disparate locations and where public records have to be produced, for instance, in a court of law for evidentiary reasons, it is critical to determine the 'physical location of digital bits and bytes' for both records and digital forensic professionals.[46] Verster[47] argues that, in addition to addressing the problem of jurisdiction within the legislative framework, there are issues of data security, ownership and legal compliance. Ideally, when South African public institutions that use cloud providers have identified public records that have enduring value, these records would have to be transferred to NARSSA.[48] However, as stated earlier, NARSSA is still working on the infrastructure necessary to ingest digital records into archival custody. On the other hand, cloud storage has become an increasingly viable storage option for archives that are unable to afford or maintain in-house, private digital infrastructure suitable for long-term preservation of digital holdings. However, a reliable cloud archive that meets the requirements and expectations of a trustworthy, virtual repository still remains in the early stages of conception. Discussions on preserving digital records in a cloud environment have reignited a debate on post-custodialism among records professionals.[49] This philosophy that grew in the 1980s asserts that archival institutions should not be limited to the traditional notion of managing archival holdings in custodial arrangements.[50]

Given the challenges, a policy on distributed custody may be desirable in the South African environment. In this regard, South Africa can learn from countries in the global hub such as Australia and Canada. The National Archives of Australia (NAA), for example, took on a policy of distributed custody in 1994, and later reversed its decision when it was able to ingest digital records into its holdings. Library and Archives Canada also adopted a policy of distributed policy. In 1993, the National Archives of Canada approved a new policy to allow certain types of digital records to reside in their creating agency. The National Archives of Canada, however, did not hand over full custodial responsibility to the creating agencies. Reproducing the National Archives' policy, Cook[51] outlines the circumstances in which digital records may best be served by leaving them in their creating institutions. He offers a model-monitoring clause that the archivist should have the creating institution sign to facilitate proper preservation. However, a great deal of the focus is on magnetic tape in these monitoring clauses. Cook[52] acknowledges that other monitoring clauses will have to be developed for other digital mediums. He lists a number of instances where records can stay with their creating agencies (that is, cost of transfer, technical considerations and so on), as well as categories and examples of records to be left in institutions (cumulative, longitudinal systems and so on) and the monitoring of digital records left in their creating institutions. The lists of categories and examples are meant as guidelines in directing appraisal decisions, with those decisions justified by the archivist in the archival appraisal report.[53]

In earlier years, Hedstrom[54] and Bearman[55] admitted that there are many instances where the acquisition of records by an archives repository is both 'unnecessary and even ill-advised'. The important aspect that should be considered when choosing whether records should be retained by the archival organisation or kept with their creators is how

best to meet the needs of the users. Issues to consider in making such a determination are technical resources, the characteristics of the organisation and the continued retention within the originating office.[56] Although Hedstrom[57] is apt at pointing out the many advantages that digital records hold for both organisations and archives to carry out their functions, she makes no mention of the amount of resources needed to undertake such initiatives, how the sheer number of digital records being created affects archival work, and what skills and competencies are needed for archivists to carry out their work. Bearman[58] contends that in a networked environment, if archives have intellectual control over the records that are deemed to be of enduring value, it does not matter much where records or users are located. What matters most is the ability for users to access the records.

Both Boadle[59] and Cunningham[60] discuss distributed custody as practised at the NAA. Boadle[61] explains that in the mid-1990s, the NAA made the decision that records created in their creating office would continue to be managed by that office after the records had ceased their day-to-day utility. The NAA would instead take on an administrative role in setting standards for those agencies on how best to manage their records. In March 2000, however, the NAA reversed its decision. Boadle states that the decision to take back custody was based on 'pragmatic and practical concerns'. Preservation projects in the library sector suggested that the long-term management of digital records by creating agencies needed to address 'technical, procedural, administrative, organisational and policy issues', and required many resources upfront which were beyond the means and expertise of the creating agencies. In addition, the Australia Service Commission's 2002 *State of the Service Report* noted confusion among employees regarding what their role and responsibilities were in the management of digital records, and uncertainty by recordkeepers about the standard requirements for electronic records.[62]

Cunningham[63] provides further details about the NAA's policy of distributed custody in 1994 and its later reversal. He explains that in the mid-1990s, the NAA felt that it needed to become more engaged in influencing record making and recordkeeping in government agencies. To meet this goal, the NAA decided to change its role and become the recordkeeping standard-setters and advisors. The decision to take on a policy of distributed custody for digital records was made because the NAA was not able to manage digital records at the time. In 2000, the NAA reversed its decision based on the knowledge gained in the management and preservation of digital records.[64]

In South Africa, there has been little discussion in the archives and records management literature about the post-custodial debate for digital records. Regardless of these limitations, a number of articles have been written about the state of digital records in South Africa which have been identified in the foregoing discussion, as well as the particular challenges facing both records managers and archivists as they relate to resources, skill levels, authority, content management systems and the long-term preservation of digital records, including how to prove their authenticity over time. The report by the Archival Platform[65] noted that most public archives are radically under-capacitated. Katuu and Ngoepe[66] also observed that the national archival system is plagued by poor infrastructure and lack of skilled capacity. This is compounded by the fact that African educators lack expertise and are ill-equipped to train others in digital records preservation. This has prompted the International Council on Archives to develop an African strategy which focuses on archival advocacy and training of trainers in digital records management. The problem with such

interventions according to Lowry[67] is that international efforts to support archival education in Africa have increasingly tended to take a 'hands-off' approach, with the majority of funding and projects being aimed at providing resources to aid African institutions to provide training, rather than projects designed to deliver large-scale education directly to students and trainees.

Like other African countries, archival education in South Africa is still in its infancy and offered by few institutions. In 2010 the Department of Arts and Culture, under which NARSSA falls, commissioned a study to investigate the demand for skills, education and training provided by higher education institutions for librarians, archivists, records managers and other information specialists. In the study, it was found that the vacancy rates for professionals such as archivists, records managers and librarians are exceptionally high and are indicative of shortages in the market or the inability of employers to effectively compete for and retain the skills of these professionals.[68] Shortage of skills is also a burning issue in the archival arena in South Africa. At this stage the education and training available for archivists consists of only a few programs offered by three institution of higher education out of 26 universities in South Africa, that is, University of South Africa, University of Fort Hare and University of KwaZulu-Natal.[69] The numbers of students who qualify in these programs are very small and in the long run it may be very difficult for the higher education institutions to sustain these programs. Another important observation by Garaba[70] is the fact that practical training and work experience is very important in the training of archivists and records managers. However, the current training programs have very little, if any, practical training. The problem of lack of skills is even more evident in areas such as preservation and conservation, and film and sound archives, as well as digital records management, which are very specialised. The Archival Platform[71] declares that public archives will not be sufficiently capacitated unless shortcomings in the training and education of archivists and records managers are addressed. This will also affect management and preservation of digital records as archivists require new skills in this area.

If the interim options of preserving digital records presented are adopted by the South African government, NARSSA, as the statutory regulator of records management in public entities, would need to provide a continuing supervisory role, provide guidelines and build capacity focusing on training and provision of sustainable infrastructure. As Adu and Ngulube[72] would attest, records management professionals in Africa are arguably not as technically adept as their counterparts in other parts of the world. As a result, there is a prevalence of limited infrastructure, policies, procedures and staff skills for collecting and preserving digital records. This lack of skills has become the teething problem for the African continent, presumably because many records management professionals view digital records as a headache. The situation cannot be left unaddressed as it could lead to a gap in the recorded history of South Africa.

Conclusion

The preservation of, and access to, digital records produced by government entities pose a difficult challenge that requires appropriate preparation and organisation. While NARSSA has digital records management policies and strategies in place that are benchmarked against international standards and best practice, it does not have a digital preservation infrastructure, nor do its staff have the technical skills required to manage a trusted digital

repository in which sustainable and authentic digital archival records can be preserved in the long term. As a result, the responsibility for preserving digital records is unconsciously shifted to government agencies. To meet its legislative mandate, NARSSA needs to establish a digital preservation solution that would address the preservation of records created in disparate systems and contribute to the formulation of best practice requirements regarding the preservation of records created in the digital environment. Furthermore, the administrative structure under which NARSSA operates should acknowledge that failure to resource the national archives to develop the necessary infrastructure for the preservation of digital records has already resulted in the government's accountability being compromised and the heritage of governance in democratic South Africa being jeopardised. Archivists in South Africa need to adjust their role and become recordkeeping standard-setters and advisors. However, to make these changes NARSSA still needs to occupy a better place of authority in government, and needs better-skilled staff members and more funding.

In order to preserve digital records, it is clear those government entities that have digital records ready for transfer to the national archives repository should consider applying for exemption from archival legislation. Once exemption is granted, the public entity can create an interim solution by developing the infrastructure necessary to preserve digital records. The records can only be transferred to the national archives repository once infrastructure has been developed to ingest digital records of enduring value. NARSSA should also consider making distributed custody an official policy until such time as the necessary infrastructure is built. Furthermore, public organisations that migrated to new systems should consider auditing the process of records migration to these systems in order to determine what has been lost. Failure to address this situation will result in the archival digital heritage of the country being lost forever.

Records management professionals in government agencies need to acquire skills in digital records management and information technology in relation to their professional training. The skills acquired will enable records management professionals to fully participate in the planning of digital records systems and in major modifications to existing systems. Records management professionals should also consider partnering with IT officials in developing recordkeeping systems. Furthermore, universities in South Africa should consider updating their curricula to include records created and stored in the digital environment.

Owing to a lack of infrastructure for management and preservation of digital records in South Africa, this study recommends that government departments should also cautiously consider exploring the possibility of storing their records in a trusted digital repository that uses cloud storage as an interim solution, while observing legal obligations, for the purpose of increased storage and access. The South African government should also develop a policy on cloud storage to guide public agencies. In this regard, the government can consider creating its private cloud for the management of public records. The overview given in this study has the obvious limitations of relying mostly on a literature review than on empirical data. Therefore, a further empirical study is recommended to assess digital records lost during migration and the recovery of such records, as well as technological requirements for the preservation of digital records in public entities.

Endnotes

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