Skills and Competencies for Authenticating Digital Records to Support Audit Process in Botswana Public Sector

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Abstract

Authenticating digital records to support the audit process requires appropriate skills and competencies. The Government of Botswana implemented a government-wide enterprise resource planning (ERP) referred to as the Government Accounting and Budgeting System (GABS) in order to improve financial management in the public sector. However, records professionals and auditors are not trained on how to authenticate records stored in GABS. This qualitative study sought to establish the skills and competencies required to authenticate digital accounting records in GABS. Interviews were conducted with a purposively selected sample of records management professionals, information and communication technology (ICT) professionals, and auditors from the Department of Botswana National Archives and Records Services, Accountant General's Department, Department of Internal Audit, Office of the Auditor General of Botswana, Department of Corporate Services and the Department of Information Technology (DIT). The study established that digital forensic knowledge of the types of integrity, processes of access, reproduction, identification and extraction is needed in order to authenticate digital records. However, such skills are lacking in the public sector in Botswana among records professionals and auditors. The study recommends continuous capacity-building training for records management professionals and auditors to enable them to keep up with technological developments and to operate effectively in the face of the ever-changing ICTs.

Keywords: Auditing, Authentication, Botswana, Public Sector, Digital Records, Records Management, ERP.

Introduction

The adoption of ICTs in the delivery of public services in Botswana has been embraced by the political leadership and supported through the formulation and implementation of policies such as the National ICT Policy and the e-Government Strategy (Government of Botswana 2004; 2012). The adoption of ICTs was part of a wider agenda of public sector reforms among which were projects such as performance management system, annual performance plans and performance-based reward system, and work improvement teams had to assist ministries in improving service delivery and organisational performance, as well as human resource management capability enhancement through policies and procedures development and implementation (Wamukoya and Mutula 2005). Financial management has also been affected as the Government of Botswana implemented a government-wide enterprise resource planning (ERP)

referred to as the Government Accounting and Budgeting System (GABS).

GABS was implemented across central government departments in 2004. It is operational in most government offices across the country. The system was mainly implemented to improve financial management processes and reporting on expenditure. It is an ERP system. The custodian of the system is the Department of the Accountant General (AGD) in the Ministry of Finance and Economic Development (MFED). The Department of Information Technology (DIT) is entrusted with the coordination of government computerisation projects coordinated system implementation (Moloi, 2009; Mosweu, 2014). The endeavour to improve public sector financial management in terms of efficiency, effectiveness, accountability, transparency, security of data management, and comprehensive financial reporting (Hendricks, 2012) has seen other African countries such as Uganda, Kenya and Tanzania implementing computerised financial management systems for similar reasons to that of the Government of Botswana.

The use of GABS in financial management processes results in the generation of digital records that are required to support the audit process. The management of digital records is a challenging vocation due to shortage of skills and competencies (Bhebhe, 2015). Indeed, as several commentators have observed in the Eastern and Southern Africa Regional Branch of the International Council on Archives (ESARBICA) region, the absence of competencies in records and archives management and the lack of stewardship in the handling of digital records are recurring challenges (Wamukoya and Mutula, 2005; Ngulube and Tafor, 2006; Mosweu, Bwalya and Mutshewa, 2016; Ngoepe and Katuu, 2017; Mosweu and Kenosi, 2018).

Due to proliferation with technology, records professionals face the challenge of establishing digital records' accuracy, reliability and authenticity and maintaining it over time so that it can be proven. This is also applicable for records created in systems such as the Government Accounting and Budgeting System (GABS). Therefore, new skills and competencies are required to enable them to authenticate digital records created and stored in ERPs such as GABS. In this regard, records professionals are supposed to be equipped with the knowledge and skills necessary to fulfil their responsibilities, which should be acquired through formal education, and establish a trusted preservation system that is capable of ensuring that accurate and authentic copies of the creator's records are acquired and preserved. For records generated in GABS to support the audit process, they need to be authenticated by skilled professionals. Authentication refers to a declaration of a record's authenticity at a specific point in time by a juridical person entrusted with the authority to make such a declaration (e.g. public officer, notary, auditor, records manager, certification authority) (InterPARES, 2007). Duranti (2005) defines the concept 'authentication' as a declaration of authenticity that can be provided by any person responsible for keeping the original of a record or an official copy. In this regard, the process can be done by the records professionals who are supposed to be the custodians in most cases, although Ngoepe (2016) emphasises that in most African countries, records professionals are mainly involved with records in the last stages of its life cycle. According to Mason (2006), for a record or a document to be authenticated, it must have integrity, reliability and be usable. Without requisite skills and competencies, authenticating digital records in ERPs can be a daunting task. This study sought to establish the skills and competencies required to authenticate digital accounting records in GABS.

Literature Review

Knowledge and skills for every profession are vital in equipping human beings with informed planning and decision making (Segaetsho and Mnjama, 2017). The effective management of records is a requisite component of good service delivery but that does not occur naturally but requires, among other things, competent and skilled staff and an operational environment with clearly defined performance expectancies (Gebbie, Merrill, Hwang, Gupta, Btoush and Wagner, 2002). It is thus clear that in any corporate environment professionals need to have knowledge, skills and competencies about management functions and activities (Van Brakel, 2003).

The International Federation of Accountants indicates that auditors performing audits in a digital environment should possess knowledge content,

which include IT systems for financial accounting and reporting (including relevant current issues and developments), principles and practices for evaluating financial accounting and reporting systems (including evaluating controls and assessing risk) and computer-assisted auditing packages and techniques. According to Carroll (2006), auditing in a digital environment entails that auditors should select, gather, analyse and report, and thus assist in adding credibility to audit findings, conclusions and recommendations. For example, they can use audit tools and techniques such as Generalised Audit Software (e.g. ACL, IDEA, Microsoft Excel or SQL queries).

Records managers and ICT specialists also need to have the required competencies and skills to manage records in the digital age. Recognising that the digital age requires a skilled and knowledgeable workforce with capabilities needed for ensuring that digital information remains accessible and usable over time, the National Archives of Australia (NAA) (2015) developed a digital information and records management capability matrix for records managers and ICT specialists to enable them to cope with requirements for the management of digital records (National Archives of Australia, 2015).

NAA advises all Australian government agencies on ways of improving digital information management for business efficiency and effectiveness and to ensure transparency and accountability (NAA, 2015). This was in recognition that a skilled and knowledgeable workforce is crucial in managing digital information. The matrix presents the capabilities that agencies need for a changeover to a digital information management regime, which would make sure that information remains accessible and usable through the passage of time in the digital environment (NAA, 2015). It outlines generic capabilities for all staff, ICT and information, and records management specialists. The capabilities as presented in Table 1 are more or less the very skills and competencies required of ICT professionals and records management professionals in the era of digital continuity as set by NAA.

In the context of Botswana, available empirical studies have shown that archives and records management professionals lack skills and competencies to manage digital records (Tshotlo and Mnjama, 2010; Keakopa, 2010; Moatlhodi and Kalusopa, 2016; Mosweu, 2014). For example, in a study that assessed digital records readiness at Botswana's Ministry of Labour and Home Affairs, the majority of the records personnel had not been trained on digital records management. This was despite the fact that the study took place at the time when the ministry was about to implement the Botswana National Archives and Records-led project dubbed the National Archives and Records Management System (NARMS). The project was actually the implementation of a government-wide digital records management system. Elsewhere, at the Ministry of Trade and Industry where an EDRMS was implemented but poorly adopted and used, it emerged that it was due to poor capacity of records management staff (Mosweu, 2014).

Poor capacity to manage digital records is not peculiar to Botswana. It has also been reported in other ESARBICA countries (Wato, 2006; Kemoni, 2009; Marutha and Ngulube, 2012; Nengomasha, 2009; Chaterera, 2016; Issa and Wamukoya, 2018), other African countries (Asogwa, 2012; Adu and Ngulube, 2017; Ngoepe, 2018) and the globe as a whole (Saman and Haider, 2012; Wang, 2009).

Table 1: Capabilities and skills of ICT specialists and records management personnel (NAA, 2015)

ICT specialists	Records management specialists
Awareness of legislation, standards and policies affecting information management	Awareness of legislation, standards and policies affecting information management
Metadata	Information governance and business risk mitigation
Information risks and destruction	Metadata
Interoperability	Risks to information
Technologies and tools	Retention and destruction of information
Data architecture	Access to information
User experience	Standards and best practices
Technologies and tools	Specialist technologies
Information costs	Communication and leadership
	User experience

Research Problem

Auditors in many African countries have rejected digital records largely because their authenticity could not be established, and therefore they became unreliable in the audit process (InterPARES, 2018a). In most cases, auditors and records professionals lack skills and competencies to authenticate digital records to support the audit process. Records produced and stored in ERPs need to be kept authentic to support the audit process. This is because authentic and complete records serve as evidence required by auditors in their work (Bhana, 2008; Ngoepe and Ngulube, 2014; Mosweu, 2019). Simple as the audit process may seem in theory, a lack of adequate records or the challenges related to their retrieval lead to increased audit risks (Bhana, 2008; Nel, 2011). In the digital environment, records management has proven to be a complex and challenging task for those entrusted with their management due to a lack of requisite competencies and skills. This has been confirmed in several studies conducted in the ESARBICA region (Wamukoya and Mutula, 2005; Ngoepe and Keakopa, 2011; Muchaonyerwa and Khayundi, 2014; Katuu and Ngoepe, 2015; Moatlhodi and Kalusopa, 2016; Ngoepe and Katuu, 2016). In view of the aforementioned, this study sought to determine the skills and competencies required to authenticate

digital accounting records in GABS among auditors, records management and ICT personnel in selected government ministries and departments in Botswana. The specific research objectives were to: (i)determine whether auditors, record managers and ICT professionals in the Botswana Government ministries have the required skills and competencies to authenticate digital accounting records generated and stored in GABS; and establish from participants opinions on the effects of inadequate skills and competencies in the authentication of digital records in the system.

Methodology

This study was qualitative and was situated within the interpretivist research paradigm (Creswell, 2014). Qualitative studies enable participants to answer questions about their experiences and meaning using their own perspective (Hammarberg, Kirkman and De Lacey, 2016). The study sample was selected from a population made up 25 ministries of the Government of Botswana and six quasi-government departments.

Participants were purposively selected from six Government of Botswana departments by virtue of their functions as mandated by the government. The departments were: Botswana National Archives and Records Services (BNARS; Department of the

Accountant General; Department of Information Technology; Office of the Auditor General of Botswana; Department of Corporate Services in the Ministry of Finance and Economic Development; and the Department of Internal Audit within the MFED.

Data were collected from auditors, records managers and ICT professionals from cited departments using interviews. Twenty-five participants took part in the study as reflected in Table 2. Data were analysed thematically using themes from the objectives of the study.

Table 2: Participants' work designations and their places of work

Department	Participant job designation	Number
Botswana National Archives and Records Services	Head: Archives Administration Head: Records Management Services Principal Records Managers II x 3	5
Department of Internal Audit	Principal Internal Auditor Senior Internal Auditor Internal Auditor x2	4
Department of Information Technology	Chief Systems Analyst Chief Programmer Systems Analyst	3
Office of Auditor General	Auditors x5 Senior Auditor	6
Accountant General's Department	Chief Accountant Senior Accountant Accountant Principal Finance Officer Principal Accounts Officer	7
Ministry of Finance and Economic Development HQ	Principal Records Manager Records Manager I	2
TOTAL		**25**

Source: Field data

Findings

The findings of the study are presented in accordance with the research questions. First, the skills and competencies of records managers, ICT professionals and auditors are presented, followed by the ones related to the impact of skills and competencies for authenticating digital accounting records in GABS. Lastly, recommendations are offered for the improvement of the authentication of digital records in the system.

The results for the first objective on skills and competencies are presented for each group.

Skills and Competencies

Records Managers

The records management professionals taking part in the study listed the following as skills and competencies needed to establish the authenticity of digital accounting records created and stored in GABS: knowledge of digital preservation and computing skills, electronic records management, enterprise content management, legal aspect of information, analytical and planning skills, metadata and auditing, effective communication and consensus building skills, appreciation of secure digital signatures platforms and security and privacy control.

The digital age poses a challenge in the skills set of archives and records management professionals, as they need to cope with the changes and the complexities associated with the records management digital environment. According to Eastwood (2006), archivists need to have a variety of skills, which comprise designing, implementing and managing record-keeping systems, especially in the digital environment. They need to be able to analyse business functions, activities, procedures and needs (Eastwood, 2006). Eastwood (2006) refers to these as "archival analysis". Equally important are metadata schema and the analysis of the impact of technology on records management.

ICT Specialists

This study found that in order for ICT specialists to establish the authenticity of digital accounting records created and stored in GABS, they need the following skills and competencies: system design, business process analysis, business rules, data analytics, computer forensics and security, database administration, IT certification (information systems auditor), IT security related technical competencies, implementation of user roles and individual logging credentials.

A secure network is essential for an operational information system. The following are the responsibilities of an information technology security professional: developing and designing security devices and software to ensure the safety of clients' information or internal products and information, managing security measures for information technology system within a networked system, operating regular inspections of systems and network processes for security updates, conducting audit process for initiating security and safety measures and strategies, customising access to information per rules and necessity and maintaining standard information security policy, procedure, and services (Easttom, 2018).

Auditors

The findings of this study revealed that for auditors to audit effectively in a digital environment and authenticate digital records created and stored within GABS, they need to possess the following skills and competencies: data analytics, business rules and business process analysis, knowledge of and the use of CAATs, an understanding of system design and development, information system audit expertise, monitoring and evaluation, training on GABS as a system and presentation and creative skills. In totality, the cited skills and competencies would enable auditors to do their work with little inhibition. Without adequate training and insufficient knowledge in the use of ICTs, auditors may not spot such accounting information system risks inherent in the audit process (Austen, Eilifsen and Messier, 2003).

The responses on the second objective of the study on effects of skills and competencies for establishing authenticity of digital records are presented.

Impact of Skills

Auditors

The study found out that a lack of skills and competencies of operating in the digital environment

by auditors will have negative consequences. It emerged that incapacitated auditors may find it difficult to establish the authenticity of evidence (records) used the audit process. One of the auditors (IA2) said:

IA2: It would not be easy to establish the authenticity of data and transactions in the system. Fraudulent activities on transaction and data manipulation would not be easily identified. Government would lose a lot of money and officers who process transactions would take advantage of that to misuse government funds.

In an audit of public sector organisations in Botswana, the Auditor General found that records were unreliable and incomplete and were not used in the audit because their authenticity was suspect. They could not be used to inform audit opinions (Mosweu, 2011). Participants gave another impact of inadequate skills and competencies among auditors as compromised audit reports that do not improve the operations of government organisations. This could result in so many errors and even fraud being committed through the system and, without due care, such errors could go undetected. Furthermore, a lack of analytical skills was also cited as an impediment for the authentication which could result in the following as pointed out by the auditors:

Compromised quality reports that do not improve the operations of the organisations. This could result in so many errors and even fraud being committed in GABS going undetected for long. Delayed audit reports due to inadequate analytical skills.

IA3: Failure to capture correct information and interpret results

IA4: Unreliable audit findings with no value. Part of the definition of internal auditing is about adding value and improving the organisation's operation using systematic approaches to evaluate and improve effectiveness of risk management, controls and governance for decision-making. Using unreliable data is more like distorting the risk management process and accountability, especially if COSO is the selected risk management model. In our case, we use COSO for risk management, which means

Control Activities and Risk Assessment components of COSO are not a true reflection of some of the business processes within the GABS environment. One evident deficiency can be realised in the segregation of duties where an authorising officer can authorise at all levels, enabling them to be able to complete a transaction with the aid of a preparing officer. The result of this was that one officer previously paid overtime more than basic salaries to some officers without detection for more than two years; a clear violation of remuneration policies. Inadequate analysis of the data that has been collected which can lead to wrong conclusions. Risk of issuing a contradictory audit opinion. There will be reports that are not communicating to stakeholders how government money was spent, and fraud can just happen in front of their eyes.

Records Professionals

When the question of what would be the impact of inadequate competencies and skills needed by records management professionals on their abilities to authenticate digital records, they tendered some of the following responses:

RM1: *Weakened capacity for ascertaining the authenticity of digital records. Compromised or intellectual control of ascertaining the authenticity of digital records. Public distrust is imminent from digital records loss. Inability to provide the necessary guidance and direction on digital records.*

RM2: *It would not be easy to identify and authenticate digital records.*

RM5: *Tempering with information or records is critical step towards committing fraud, so a lack of knowledge and skills about electronic systems results in mismanagement and leaves room for exploitation by fraudsters.*

RM6: *They will not be able to know the authenticity of the records if they lack the skills.*

RM7: *Lack of skills means one will not be able to use the systems in any way and authentication of records will not be ascertained.*

These findings collectively postulate that a lack of requisite skills and competencies by records management professionals has a negative impact on their ability to manage digital records, including their authentication.

ICT Professionals

When ICT specialists were asked about the impact of inadequate technical competencies and skills on their ability to authenticate digital records, they indicated that system security would be compromised. One participant, ICT2, asserted that:

> *There is likelihood of making mistakes or accidentally deleting data by overriding functions if one does not know the impact of such actions. This may cause data loss or corruption.*

Another, ICT 3, was of the view that:

> *Mistakes that can compromise data quality data in the system can happen. Information leakage, i.e. unauthorised personnel may have access to vital information.*

Clearly, ICT professionals are indispensable in the authentication of digital records in GABS. Several studies undertaken in Botswana (Moloi and Mutula, 2007; Mosweu, 2014; Moatlhodi and Kalusopa, 2016; InterPARES, 2016) and in the ESARBICA member countries (Wamukoya and Mutula, 2005; Muchaonyerwa and Khayundi, 2014; Malanga and Kamanga, 2018) have shown that records management personnel lack the capacity to manage digital records. Therefore, alone, they cannot hope to deal with issues pertaining to the management of digital records, including the maintenance of their authenticity. It is therefore crucial that they collaborate with ICT experts to address some issues related to the management of digital records. For example, ICT professionals are responsible for maintaining the infrastructure necessary for digital records management, including metadata management. They are also responsible for the administration, development, maintenance and implementation of policies and procedures necessary

to ensure the security and integrity of databases holding records (Peshkar and Ghosekar, 2015).

Conclusion and Recommendations

The management of digital records, including the maintenance of their authenticity, requires personnel with the requisite skills and competencies. It has emerged from this study that the management of digital records is a complex vocation. Both records management professionals and auditors were found wanting with regard to their abilities to authenticate records generated and stored in GABS. Their skills and competencies are simply inadequate for the task. As for records managers, they are mandated to manage organisational records and their limitations where managing digital records means the proper management of records in the ERP (GABS) is beyond their capabilities. The same is true for auditors who audit financial statements in the digital environment. Their limitations in conducting audits through the ERP have led to their dependence on ICT professionals for assistance. This scenario does not augur well for their independence as auditors. It has been revealed in this study that although records management professionals, ICT professionals and auditors have been trained to perform their work functions, it is necessary to continue equipping them with skills and competencies in order for them to continue to operate effectively in the face of the ever-changing technologies. This would enable them to continue being in a position to authenticate records in digital systems, including for auditing purposes.

For proper skills and competencies to be acquired, proper education and training that recognise the complex digital space in which digital records are managed and the needs of stakeholders in the financial audit process are key both in the short and the long term. The recommendations of this study are segmented into two, that is, auditors and records managers.

This study has established that auditors, both from OAGB and DIA, should be trained more on internal audit processes and techniques, as they have accounting qualifications not internal audit ones, especially for auditing in the digital environment.

The records management professionals need to have capacity to manage records in digital formats. BNARS should promote deliberate and continuous

dialogue, engagement and empowerment of records managers on public sector digital records management issues through workshops, conferences, seminars, and best practice international benchmarking visits to those who have made strides on management of digital records. Also, it is ideal that records management professionals be trained on basic financial management so that they appreciate related financial records management issues, especially the management of computerised ones.

References

Adu, K. K. and Ngulube, P. (2017). Key Threats and Challenges to the Preservation of Digital Records of Public Institutions in Ghana. *Information, Communication and Society,* 20 (8) 1127-1145.

Asogwa, B. E. (2012). The Challenge of Managing Electronic Records in Developing Countries: Implications for Records Managers in Sub-Saharan Africa. *Records Management Journal,* 22(3) 198 – 211.

Austen, L. A., Eilifsen, A. And Messier, W. F. (2003). Auditor Detected Misstatements and the Effect of Information Technology. Available At:

https://core.ac.uk/download/pdf/52069378.pdf (Accessed 3 December 2018).

Bhana, P. (2008). The Contribution of Proper Record-Keeping towards Auditing and Risk Mitigation: Auditor-General of South Africa's Perspective. Paper Presented at the 3rd Annual General Meeting of the South African Records Management Forum, Midrand (South Africa), 10 - 11 November. [Online] Available At: http://www.khunkhwane.co.za/uploads/the% 20contribution%20of%20proper%20 records% 20keeping%20towards %20auditing %20 and%20risk% 20mitigation% 20%20auditor% 20general%20perspective.pdf (Accessed 20 April 2017).

Bhebhe, S. (2015). Contemporary Diplomatics of the Civil and Deceased Estate Case Files Found at the National Archives of Zimbabwe. *Records Management Journal,* 25(1) 107-120.

Carroll, M. (2006). An Information Systems Auditor's Profile. Masters Dissertation. University of South Africa, Pretoria.

Chaterera, F. (2016). Managing Public Records in Zimbabwe: The Road to Good Governance, Accountability, Transparency and Effective Service Delivery. *Journal of the South African Society of Archivists,* 49: 116-136.

Creswell, J. W. (2014). *Research Design: Qualitative, Quantitative, and Mixed Methods Approaches*. Los Angeles: Sage Publications.

Duranti, L. (2005). Authenticity and Authentication in the Law. [Online] Available at: http://www.interpares.org/display_file.cfm?doc=ip2 (policy) authenticity-authentication_law.pdf (accessed 16 march 2017).

Easttom, W. C. (2018). Computer Security Fundamentals. 3rd Edition. Pearson IT Certification.

Eastwood, T. (2006). Building Archival Knowledge and Skills in the Digital Age. *Archival Science,* 6(2) 163-170.

Gebbie, K., Merrill, J., Hwang, I., Gupta, M., Btoush, R. and Wagner, M. (2002). Identifying Individual Competency in Emerging Areas of Practice. *An Applied Approach, Qualitative Health Research*, 12(7) 990-999.

Government of Botswana. (2007). *National Information and Communications Technology Policy (Maitlamo Policy)*. Gaborone: Government Printer.

Government of Botswana. (2012). *Botswana's National E Government Strategy 2011–2016,* Gaborone: Government Printer.

Hammarberg, K., Kirkman, M. and De Lacey, S. (2016). Qualitative Research Methods: When to Use them and How to Judge them. *Human Reproduction,* 31(3) 498–501.

Hendricks. C. J. (2012). Integrated Financial Management Information Systems: Guidelines for Effective Implementation by the Public Sector of South Africa. *South African Journal of Information Management,* 14(1) 1-9.

Interpares. (2007). The Interpares 2 Project Glossary. [Online] Available at: http://www.interpares.org/ip2/display file. cfm?doc= ip2book_glossary.pdf (Accessed 20 May 2017).

Interpares Trust. (2016). Implementation of Enterprise Wide Systems to Manage Trustworthy Digital Records in Botswana's Public Sector (Af04). [Online] Available At: https://interparestrust.org/assets/public/dissemination/af04_20161231enterprise records management botswanaliterature review.pdf (Accessed 12 July 2017).

Issa, M. and Wamukoya, J. (2018). The Role of Electronic Records Management in Promoting the Delivery of Justice in Tanzania: Perspectives From Dar Es Salaam Commercial Court. *Information and Knowledge Management,* 8(2): 30-35.

Katuu, S. And Ngoepe, M. (2015). *Managing Digital Records in a South African Public Sector Institution.* Conference: Infuture2015: E-Institutions – Openness, Accessibility, and Preservation, in Zagreb, Croatia. [Online] Available At:

https://www.researchgate.net/publication/291327736 managing digital_records in_a south african_public sector_institution (accessed 20 september 2017).

Keakopa, S.M. (2007). *The Management of Electronic Records in Botswana, Namibia and South Africa.* PhD Thesis, University of London, London.

Keakopa, S.M. (2010). Overview of Archival and Records Management Developments in the Esarbica Region. *Archives and Manuscripts,* 38(1) 51-77.

Kemoni, H.N. (2009). Management of Electronic Records – Review of Empirical Studies from the Eastern, Southern Africa Regional Branch of the International Council on Archives (ESARBICA) Region. *Records Management Journal,* 19(3) 190-203.

Malanga, D. F. And Kamanga, C. G. (2018). E-Records Readiness at Karonga District Council: Applying Irmt E-Records Readiness Assessment Framework. *Information Development,* 1-10.

Marutha, S. And Ngulube, P. (2012). Electronic Records Management in the Public Health Sector of the Limpopo Province in South Africa. *Journal of the Society of South African Archivists,* 45: 39-67.

Mason, S. B. (2006). Proof of the Authenticity of a Document in Electronic Format Introduced as Evidence. [Online] Available At:

http://www.mnhs.org/preserve/records/legislativerecords/docs_pdfs/proof_of authenticity of_a_document.pdf (Accessed 3 January 2019).

Moatlhodi, T. M. and Kalusopa, T. (2016). An Assessment of E-Records Readiness at the Ministry of Labour and Home Affairs, Gaborone, Botswana. *Mousaion,* 34(3) 1-22.

Moloi, J. and Mutula, S. (2007). E-Records Management in an E-Government Setting in Botswana. *Information Development,* 23 (4) 290–306.

Moloi, J. (2009). E-Records Readiness In The Public Sector In Botswana. *Esarbica Journal, 28,* 105–127.

Mosweu, O. (2011). Performance Audit in the Botswana Public Service and Arising Records Management Issues. *Journal of the South African Society of Archivists,* 44: 107–115.

Mosweu, O. (2014). Factors Influencing Adoption of the Document Management Workflow System by Action Officers and Records Officers at the Ministry of Trade and Industry in Botswana". MA Dissertation, University of Botswana, Gaborone.

Mosweu, O., Bwalya, K. and Mutshewa, A. (2016). Examining Factors Affecting the Adoption and Usage of Document Workflow Management System (DWMS) Using the UTAUT Model. *Records Management Journal,* 26(1) 38 – 67.

Mosweu, T. and Kenosi, L.S. (2018). Implementation of the Court Records Management System in the Delivery of Justice at the Gaborone Magisterial District, Botswana. *Records Management Journal,* 28(3) 234-251.

Muchaonyerwa, N. and Khayundi, F. (2014). The Management of Digital Records in the Office of the Premier of the Eastern Cape Province, South Africa. *African Journal of Library and Information Science,* 24(1) 41-52.

National Archives of Australia. (2015). Digital Information and Records Management Capability Matrix Skills and Knowledge for Australian Government Employees. [Online] Available at:

http://www.naa.gov.au/naaresources/documents/capability-matrix.pdf (Accessed 20 May 2017).

Nel, T. (2011). Audit Findings and Records Management in the Public Sector. Paper Read at DBS Document and Records Management Conference, Midrand (South Africa), 19-21 September.

Nengomasha, C. (2009). A Study of Electronic Records Management in the Namibian Public Service in the Context of E-Government. PhD Thesis, University of Namibia, Windhoek.

Ngoepe, M. (2016). Records Management Models in the Public Sector in South Africa: Is there A Flicker of Light at the End of the Dark Tunnel? *Information Development,* 32(3) 338-353.

Ngoepe, M. (2018). Playing Catch Up: Africa's Time to Respond to Grand Societal Challenges. *Flash: ICA Newsletter,* September, 18-19. [Online] Available at:

https://www.ica.org/en/flash-september-2018-ndeg36 (Accessed 22 June 2018).

Ngoepe, M. and Katuu, S. (2017). Provision of Records Created in Networked Environments in the Curricula of Institutions of Higher Learning in South Africa. *New Review of Information Networking,* 22(1) 1-12.

Ngoepe, M. and Keakopa, S.M. (2011). An Assessment of the State of National Archival and Records Systems in the ESARBICA Region. *Records Management Journal,* 21 (2) 145-160.

Ngoepe, M. And Ngulube, P. (2013). Contribution of Record-Keeping to Audit Opinions: An Informetric Analysis of the General Reports on Audit Outcomes of the Auditor-General of South Africa. *Esarbica Journal, 32:* 52–61.

Ngoepe, M. And Ngulube, P. (2014). The Need For Records Management in the Auditing Process in the Public Sector in South Africa. *African Journal of Library, Archives and Information Science,* 24(2) 135–150.

Ngulube, P. and Tafor, V. F. (2006). The Management of Public Records and Archives in the Member Countries of Esarbica. *Journal of the Society of Archivists,* 27 (1) 57 – 83.

Peshkar, P. and Ghosekar, P. (2015). Role of Database Administrator in the IT Industry. *International Journal of Emerging Research in Management and Technology,* 4 (12) 41-44.

Saman, W. M. and Haider, W. S. (2012). Electronic Court Records Management: A Case Study. *Journal of E-Government Studies and Best Practices,* 1-11.

Segaetsho, T. and Mnjama, N. (2017). *Knowledge and Skills on Preservation of Paper Materials in the Selected Heritage Institutions in Botswana.* [Online] Available at: https://www.researchgate.net/publication/320471698 (Accessed 10 March 2019).

Tshotlo, K. And Mnjama, N. (2010). Records Management Audit. The Case of Gaborone City Council, Esarbica Journal, 29.

Van Brakel, P. (2003) In Need of Document Management Competencies. South African *Journal of Information Management*, 5(4) 1-4.

Wamukoya, J. and Mutula, S. (2005). Capacity-Building Requirements for E-Records Management: The Case in East and Southern Africa. *Record Management Journal,* 15 (2) 71-79.

Wang, J. (2009). Challenges and Strategies for Managing Digital Records in a Public Organisation: Findings from the Team China Case Study. In *Proceedings of the Interpares 3 International Symposium*, 4-5 June 2009, Seoul, South Korea (Seoul: Sungkyunkwan University, 2009) 243-277.

Wato, R. (2006). E-Records Readiness in the ESARBICA: Challenges and the Way Forward. *ESARBICA Journal,* 25: 69-83.

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