# Digital Preservation Challenges of Public Sector Records in Masvingo Province of Zimbabwe.

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The government's drive towards e-governance and improved service delivery has promoted the use of information and communication technologies (ICTs) by a number of public institutions in Masvingo province of Zimbabwe. This has resulted in the generation of large volumes of digital records. This qualitative study sought to bring to the fore the digital preservation challenges in Masvingo Province of Zimbabwe with a view to proffering recommendations for their effective tackling, thereby guaranteeing continued accessibility to digital records. This study adopted a multiple-case-study design. Face-to-face semi-structured interviews were used as the main instrument for data collection. Data were also collected through observation and document analysis to  enhance trust worthiness of the findings.Data were manually processed and analysed using thematic content analysis. The study established that public agencies in the Masvingo province were failing to guarantee long-term preservation and security of digital records. This was due to weak legal framework, lack of policies and guidelines, paucity of standards, lack of proper infrastructure and resources, inadequate budgets, lack of knowledge and technical skills and inadequate power supply. The study recommends the strengthening of the legal framework, development of preservation policies, standards and guidelines, adoption of trusted digital repositories (TDRs) that are compliant with the OAIS reference model, provision of budgets, as well as continuous training of staff involved with the preservation of digital records.

**Keywords:** Digital preservation, challenges, Masvingo province, Zimbabwe.

## INTRODUCTION

The twenty-first century has seen government services being increasingly executed using information communication technologies (ICTs). Zimbabwe in general, and the public sector institutions in Masvingo Province, did not neglect the adoption and use of ICTs. The resultant digital records are becoming the basis for confirming pension and other entitlements, registering births and deaths, verifying citizenship, and certifying voting rights, enabling the collection of taxes and census enumeration, supporting financial management, and enabling audits and evaluation, helping to resolve land claims, supporting litigation, documenting inter-governmental agreements, enabling economic planning, describing the government's accomplishments, documenting its transgressions, monitoring the nation's developments and governance, and enabling countless other information-intensive activities (IRMT 2004). However, digital information is highly vulnerable to loss through neglect or mismanagement (Cunningham 2011:84). Preservation of digital records has become of paramount importance and critical to ensuring continued access to information. Ignoring digital preservation challenges, for instance, technological obsolescence and fragile storage media, stifles the potential gains society would have received in return for the personal, economic, and professional investment in information technology (Adu 2015:58). Furthermore, this may result in national amnesia and a gap in national heritage due to a digital Dark Age (Ngoepe 2017). This study seeks to establish the digital preservation challenges Masvingo Province is facing. The study aims to make recommendations for ensuring the survival of digital records for as long as they are needed.

## BACKGROUND OF THE STUDY

Formal record-keeping in Masvingo Province can be traced to the colonial administration which commenced with the granting of the royal charter by the Queen of England in 1889 to the British South Africa Company (BSAC). The intention was to develop and administer the territory  (now Zimbabwe) as  a  British  protectorate  (Matangira 2016:23-24).  By the

time of independence in 1980, a great deal of investment has been put into the records and archives management business (Matangira 2016:28).Production of digital records received a boost in Zimbabwe with the launch of the electronic government programme in 2011. According to Mutsagondo and Chaterera (2014:2), this programme aimed at enhancing access to, and delivery of government and other services would benefit the citizens, while driving towards effective governance and increased transparency and accountability. The management of records irrespective of format in the public-sector institutions in Zimbabwe is guided by the provisions of the National Archives of Zimbabwe (NAZ) Act Chapter 25:06 of 1986.

However, the improvements brought about by the 1986 Act did not yield the much anticipated improvements in records and archival management services. The country has gone through a tough political and economic crisis since the dawn of the 21$^{st}$ century; and NAZ's records management outreach programmes were negatively affected (Murambiwa 2012). According to Matangira (2016:47), compromised records-keeping activities were inevitable, as public departments had to operate without the guidance of 'experts' from the NAZ. The period was dubbed a disastrous situation by Matangira (2016:47), who further notes that "the momentum that the new government had started off with at independence was beginning to erode and so were record-keeping activities throughout the country".

The current archival legislation in Zimbabwe does not adequately provide for the management of these fast proliferating digital records( Mutsagondo and Chaterera 2014; Huni and Dewah 2019).The legislation lacks clear clauses on creation, storage, appraisal, destruction, and transfer of digital records to an archival repository. Mutsagondo and Tsvuura (2017) postulate that, the regulatory and legal framework governing digital records and archives in Zimbabwe is in shambles. This has resulted in records management practitioners resorting to a hit-and-miss approach when managing digital records (Mutsagondo and Chaterera 2014). In Zimbabwe, there is no clearly defined strategy on e-government adoption (Ruhonde, Owei and Maumbe 2008). The current NAZ Act can be classified as a second-generation legislation which, according to Parer (2000), should be updated taking into account the electronic environment, convergent technologies, the web environment, web portals and gateways, government online initiatives, transactions, e-business, knowledge and information management, amongst other aspects. Therefore, NAZ is facing challenges in exercising its mandate to play a major role in the archiving of digital records. The archival institution is also failing to meet the International Council on Archives' picture of an archival institution in a digital era as outlined in Nkala, Ngulube and Mangena (2012:112).Such an institution should:

- Facilitate the establishment of policies, procedures, systems, standards, and practices designed to assist the creators of digital records to create and retain records which are authentic, reliable, and preservable.

- Be involved in the entire lifecycle of digital records to ensure the capture, preservation, and continued accessibility of records identified as having archival value.

- Define the requirements for preservation and accessibility to ensure that digital archival records remain available, accessible, and comprehensible through time.

In practical terms, NAZ at the moment has left the task of managing and preserving digital records to the creating agencies (Bhebhe 2015:118). The NAZ Act does not provide any clue regarding transfer procedures of digital records from registries to the public archives (Mutsagondo and Chaterera 2014:4). Currently, no public office in Zimbabwe has ever transferred its digital records to the national archival institution (Mutsagondo and Chaterera 2014:4). Public departments are managing and preserving digital records according to the systems which best suit their institutions (Nkala, Ngulube and Mangena 2012:114). It is therefore apparent that the execution of ICT-based projects in government is achieved through a piece-meal approach without any policy, strategy, or framework of principles to support the creation, maintenance, and preservation of digital records and archives (Ruhonde, Owei and Maumbe 2008;Nkala, Ngulube and Mangena 2012;Bhebhe 2015; Tsvuura and Ngulube 2020).

## STATEMENT OF THE PROBLEM

The main problem this study sought to address is that public departments in Masvingo Province are losing significant digital records that should be strengthening their accountability, transparency, and effectiveness in delivering their core mandates. For example, Chaterera (2016:128) discovered that digital records held in public registries in Zimbabwe were not effectively managed.This state of affairs directly compromises the attainment of good governance, transparency, and effective service delivery. Digital records were embraced in Masvingo province in addition to a chaotic manual paper-records system (Maboreke 2007). As Ngulube and Tafor (2006:69) would argue, automating a chaotic records management system creates chaos that can stifle the preservation of digital information. Therefore, it is necessary for public departments to suggest sustainable digital preservation strategies. NAZ must also be pro-active, and play a leading role in solving digital preservation challenges.

## PURPOSE AND OBJECTIVES OF THE STUDY

The purpose of this study was to bring to the fore the digital preservation challenges in Masvingo Province of Zimbabwe with a view to proffering recommendations for their effective tackling. This would guarantee continued accessibility to digital records. The specific objectives of this study were to:

i.       Establish the digital preservation challenges confronting Masvingo Province.

ii.      Make recommendations on ways to mitigate the digital preservation challenges at hand.

## RESEARCH METHODOLOGY

Methodology is central to the research process, being the lens through which a researcher looks when making decisions on acquiring knowledge of social phenomena and finding answers to research questions (Ngulube 2015). This study used a qualitative research approach; it adopted a multiple-case-study design. Face-to-face semi-structured interviews were the main instrument for data collection. Data were also collected through observation and document analysis to enhance trustworthiness of the findings. The population for this study comprised of seventy-one (71) public departments in Masvingo province. Before the data collection exercise, the researcher contacted the departments to find out the ones that preserve digital records. Nine (9) parastatals, five (5) central government departments and one (1) local authority confirmed that they preserve digital records. This gave a total of fifteen (15) departments which the researcher purposively chose to participate in this study. The researcher sought permission in writing to carryout research in each department, explaining clearly the research topic and purpose of the study. However, permission was granted by thirteen (13) departments. These departments were assigned code letters A to M. Targeted participants were also selected using purposively sampling .The sample comprised three participants per department drawn from top administration officers, records management officers, and information and technology (IT) officers involved in the preservation of digital records. The researcher also ensured that the rights of all participants were not violated by obtaining informed consent from participants before the actual data collection exercise. However, actual interviews were conducted with thirteen (13) top administration officers (who were coded AD1 to AD13), thirteen (13) records management personnel (who were coded RM1 to RM13), and six (6) IT officers (who were coded IT1 to IT6). The other departments had no IT officers at provincial level. Data were manually processed and analysed.

## RESEARCH FINDINGS

This section presents research findings of this study.

**Table 1.1: Interview Responses on Digital Preservation Challenges Masvingo Province Confronts**

| Department | Participant | Response |
|---|---|---|
| M | RM13 | We are very unfortunate in the sense that the current National Archives Act Chapter 25:06 of 1986 has little meaning when it comes to the management and preservation of digital records. No one listens to our concerns when we want to advance digital preservation issues due to lack of a strong reference point in the Act in terms of clear instructions on creation, storage, appraisal, destruction and preservation of digital records. |
| E | RM5 | Our digital preservation strategies are weak as the legal framework is also weak. We are failing to operate with authority as the Act neither gives us the mandate to preserve digital records nor spells out detailed practices and procedures for preservation of these records. |
| J | RM10 | At this department, we have no knowledge about any digital preservation standard and we are also now hearing that there are what are called trusted digital repositories for preserving digital records which we neither have nor have seen. |
| L | RM11 | We lacked written documents like preservation policy, access policy, security and privacy policy and guidelines for handling storage media, as well as social media policy or guidelines. |
| F | AD6 | Retention and disposal of digital records is done at the discretion of the officers charged with the preservation of the digital records and there are no guidelines or expertise to carry out appraisal of these records. |

**Continuation of Table 1.1**

| I | RM9 | As records and information management section, we are so much looked down upon by top management to the extent that our concerns are always not a priority |
|---|---|---|
| M | AD13 | As a department we cannot be solely blamed for this situation because according to the law of the country, the role of preserving all records including these digital ones is the mandate of the National Archives of Zimbabwe. They are the ones who should be having well developed systems and infrastructure to absorb for preservation those records of enduring value our systems are generating. The infrastructure that we have can be best described as makeshift just to avoid the loss of valuable information and we feel betrayed by the national archival institution. |
| F | IT2 | Our system is not fully developed and the budget that we get to carry out digital preservation are erratic and inadequate. |
| H | IT3 | We just adopted our system without consulting the National Archives for informed guidance but the system so far is doing us a good job |
| G | RM7 | We are also stuck on ways of harvesting and preserving information on our website and social media platforms electronically and hence we again print and file it.We did not receive adequate training on how most of the digital preservation strategies work as we just learnt about them in passing without any practical demonstration on how they can be implemented. |
| C | IT1 | I am lagging far behind the pace of technological developments as a professional due to lack of budgets for purchasing modern machines and softwares, as well as for continuous training. This is greatly compromising my efficiency in executing my duties. The department has been failing to send me for workshops, conferences or seminars since 2013. |
| B | RM2 | Our department have not been prioritising staff development in the past five years due to economic hardships and partly because we are headed by officers who place little importance on records management issues. The National Archives used to carry-out training workshops for us on paper records management issues but since we started having some of our records in digital format, they are nowhere to be seen. We lack basic skills in appraisal, management and preservation of digital records. |
| J | IT5 | We do not know how to appraise records that come to us haphazardly and we do not have an automated validation system to verify the integrity, completeness and correctness of the transferred records. There is no quality assurance or guidelines to verify authenticity and we just upload the records without attaching sufficient metadata. |
| M | IT6 | Some of our digital records on computer tapes are now failing to read due to sticking and breaking of the magnetic ribbon. These days we adopted backup and cloud storage to preserve some of our records. |
| F | IT2 | We lost some of our information in 2014 when we migrated from the old system to a new system we are using now. The other challenge we have is of adequate power supply and power backup. |
| K | AD11 | We are grappling to contain the threat of viruses and crashing of machines and we do not have conducive infrastructure to store our external storage media such as CDs, DVDs and external hard-drives. |
| L | RM12 | We have an incident about two years ago whereby outside identity thieves hacked and stole some documents from our system. |
| A | AD1 | Accessing some of the digital records is a mammoth task due to poor arrangement, description and indexing. Moreover, some records were preserved without accompanying metadata. |
| M | IT6 | I think our disaster management plan now needs to be reviewed as it does not address potential risks to our digital records |

Through observation, this research also established that none of the departments was practising migration by normalisation. This is a strategy whereby the data file is converted to an open format such as Open Document Text (.odt) for word-processing documents, Open Document Spreadsheets (.ods) for spreadsheets, SIARD for databases, Open Media Framework for videos, and Open Document Presentation (.odp) for PowerPoint presentations. For instance, departments A, C, D, E, G, H, J, K and M were using Microsoft Word Document (DOC), departments D and H were using Microsoft Excel Spreadsheet (XLS), departments B, C, D, F, G, H, I, L and M were using Database format (.dbf); and all departments from A to M Microsoft PowerPoint Presentation (.ppt) which are proprietary file formats. Through observation, this research also established that departments (A, B, D, E, F, I, J, K and L) were printing hard copies and filing into their manual system some of their digital records, usually those transmitted through electronic mails (e-mails) and on their websites and social-media platforms.

This research through document analysis also established that departments A, B, D, E, G, I, J and K lacked crucial documents such as preservation policies, access policies, security and privacy policies, and guidelines for handling storage media, as well as social-media policy or guidelines .Through document analysis, this study established that departments C, F, and M had ICT policies. However, through thorough analysis of the documents, this research also established that these policies had more to do with how ICT gadgets should be used and maintained; as well as procurement procedures for hardware and software packages and connectivity issues. The policies were silent on digital records management and preservation issues.

Document analysis also yielded that departments H, L and M had retention and disposal policies. However, through thorough review of the documents, this research established that the policies were much more applicable to paper records, lacking specific instructions on how to dispose of digital records, and by whom this should be carried out. Retention and disposal policies were absent in departments A, B, C, D, E, F, G, I, J and K; this research discovered that retention and disposal was not properly conducted. Through document analysis, this study discovered that departments H and M had written disaster-management plans. However, the disaster-management plans focused much more on salvaging paper records than digital records. The disaster plans were silent on tackling threats to and vulnerabilities of digital records such as migration errors, software obsolescence, disk crashes, and bit rot.

**DISCUSSION**

The National Archives Act is the legal framework for the management and preservation of all public-sector records in Zimbabwe. However, participants in this study revealed that they were not receiving much help from the provisions of the Act in terms of managing and preserving their digital records.   B bScholars such asDube (2011),Mutsagondo and Chaterera (2014), Bhebhe (2015), Mutsagondo and Tsvuura 2017, Ngoepe (2017), Mutsagondo and Ngulube 2018, Huni and Dewah(2019), and Tsvuura and Ngulube (2020)criticise the Act for its failure to provide clear clauses on creation, storage, appraisal, destruction, and transfer of digital records from records management systems to a digital archival repository. No departments were conforming to any digital preservation standard in their preservation efforts. Carrying out digital preservation without conforming to standards as in the case of the studied departments works against the sustainability of digital repositories. The use and development of standards has long been a cornerstone of the information industry. Such standards facilitate access, discovery, and sharing of digital resources, as well as their long-term preservation. This comes about through organisational compliance and interoperability between diverse systems within and beyond the sector (DPC 2016a).

The departments were also lacking crucial documents such as apreservation policy, a security and access policy, an ICT policy, and guidelines for handling storage media. This situation of either lack of or paucity of standards, policies, and guidelines militates against effective digital preservation. According to DPC (2016a), a digital-preservation policy enables digital preservation to be carried out within an agreed framework, providing a clear line of responsibilities. Asogwa (2012) also posits that databases containing personal, financial, and medical records, as observed in this research as well, can pose security, confidentiality, and privacy violation challenges if proper access and security precautions are not put in place in the form of a policy. Lacking an ICT policy also poses a great threat to the preserved records. The ICT policy ensures that an organisation's ICT-related investment, operations, and maintenance processes and usage, are well directed for sustainability (Anie 2011). Lack of a retention and disposal policy in the studied departments also increases the chances of loss of valuable records through wrongful disposal actions.Smith (2007) also argues that it is dangerous to believe that an office can keep everything in digital form. Should systems be upgraded, it may not be easy to migrate the information to new software.

This study also confirms several studies of a similar nature in the ESARBICA region. For instance, Tsabedze(2020), discovered that there were no coordinated e-records policy or strategy at government level that cuts across and integrates e-records management in all Eswatini ministries. Motupu (2015) notes the lack of a digital-records management policy in Botswana and Wamukoya; and Lowry (2013) remarks on the lack of policies in Kenya and Uganda. These results are also in line with those of Nengomasha (2009). The researcher discovered that the management of digital records in Namibia was highly challenged .A lack was found of records retention and disposal policies, poor security and confidentiality controls, as well as absence of policies and procedures to guide the management of both paper and digital records.

The intended benefits of electronic government will be compromised unless there is adequate infrastructure for managing and preserving the created digital records (Nkala, Ngulube and Mangena 2012:110).The infrastructure and resources found in the studied departments were not adequate to the sustaining of long-term digital preservation strategies. The systems were also not sufficiently developed to allow for interoperability in the event of a change in the hardware and software environment. This research established that the departments were conducting digital preservation without adequate power supply and power backup. According to the Minnesota History Society (2012), appropriate and sufficient power supply must be delivered to the server room, inadequate power causes servers to overheat and fail, with inevitable loss of data.

Insufficient budgets or lack of budgets is another significant factor militating against achieving sustainable strategies for

preservation of digital records in Masvingo Province .According to Ngulube (2003:288), funding is key to formulating and implementing preservation programmes. There are several costs associated with digital preservation, such as costs of programme and project management, skills training for staff, and new software needed to implement the retention of digital records. Therefore, operating without a budget translates to a futile endeavour as far as preservation of digital records is concerned. The findings of this study that the available infrastructure and resources were inadequate to support the long-term strategies for preservation of digital records in Masvingo Province confirm Matangira (2016)'s observations. The scholar believes that Zimbabwe is far from complying with the expectations of the records management standard ISO 15489-1:2016. A similar study was conducted by Ngulube (2012), examining the preservation of public digital information for the sustenance of e-governance in sub-Saharan Africa. This study also established that infrastructure in the greater part of sub-Saharan Africa is inadequate to the capturing, managing and preserving of digital records, including those on social media.

In today's digital environment, the focus is on capabilities to manage digital information in all systems in which it is created, transmitted, managed, preserved, and accessed (National Archives of Australia 2017). Mutsagondo and Ngulube (2018) add that general records management skills, IT skills, management skills, software engineering skills, preservation skills, information systems skills and office systems skills are qualifications and competencies expected from personnel managing digital records However, in the studied departments, records management officers confessed that the curriculum they studied was more inclined to the management and preservation of paper records, with little depth on management and preservation of digital records. The records management and IT officers also highlighted that their departments were neither prioritising staff development, nor sending staff to seminars, conferences, and workshops. Their lack of trust in the digital preservation system resulted in most of them resorting to printing and filing some of their digital records. This behaviour can therefore be attributed to lack of both adequate resources, as well as a dearth of practical technical skills to execute sustainable digital preservation strategies. The findings of this research are similar to the observations of Malemelo, Dube, David and Ngulube (2013). These researchers commented that computer systems at Marondera Municipality were not being extensively used in the day-to-day activities. Members of staff were not well versed in some information technology programmes used in financial records management. Similarly, Keakopa (2018) observes that, inadequate staffing levels, professional training, backlogs of records to be appraised, and management of electronic records are some of the issues ESARBICA member states are grappling with.

Preservation strategies are bound to be ineffective if proper access, privacy, and security issues are not addressed. Such efforts can guard the collection against malicious damage, loss, forgery, and theft, and can ensure that files are presented according to user needs (Gracy and Kahn 2012).Inadequate attention to access, security, and privacy issues has seen the Masvingo Province facing numerous challenges, such as hacking, viruses, and crashing of machines. Therefore, access, security, and confidentiality or privacy controls support digital preservation strategies and programmes .Furthermore, they give an understanding of who has access to content, who can perform which actions on that content, and enforcing these access restrictions (DPC 2016b). The departments admitted that there were challenges in accessing some of their records. Poor arrangement was one culprit, and there was little description and indexing. The records were simply stored without adequate metadata. This research also found that Masvingo Province had yet to thoroughly deal with access, privacy, and security issues: no departments were operating with access policies, digital-records disaster-management plans and guidelines for managing digital storage media. Digital storage systems are prone to disasters. Operating without a disaster-management plan, as in the studied departments, poses a great risk of losing completely the preserved records. A disaster-management plan is critical as far as continued access to digital records is concerned. Such a plan provides detailed instructions for staff to follow in the event of various types and scales of disaster. Additionally, this plan provides instructions for restoring the content of the digital collection from backup copies ,inter alia (IRMT 2009).Poor security and confidentiality controls have also been identified as major factors contributing to failure to capture and preserve digital records in the ESARBICA region (Wamukoya and Mutula 2005).

The findings of this research show that backup and byte replication, migration, printing and filing, capturing preservation metadata, and cloud computing, were the preservation strategies used in Masvingo Province. The records-management officers conceded that they have limited technical skills and knowledge on other strategies, such as ways to implement emulation and encapsulation. The strategies the province is currently using are compromising the long-term preservation of digital records. Corrado and Moulaison (2014:4) argue that backup and byte replication alone cannot guarantee the perpetuity and longevity of digital records. Such strategies provide only a short-term to medium-term strategy to extend the life of these resources. From another angle, Ngoepe (2017) argues that cloud storage can only be considered an interim option for preserving digital records. There are more issues around cloud storage that are against the norms of the records and archival management profession. Katuu and Ngoepe (2015), and also Branco and Santos (2015:4)expound that cloud storage has no guarantee of continued availability of stored data in an authentic and reliable form. Your data is uploaded onto computers over which you do not have control. Departments had not yet embraced open standard and non-proprietary formats in their migration efforts .This keeps records vulnerable to technological obsolescence challenges.

**CONCLUSION**

Preservation of digital records in Masvingo Province is an ongoing struggle. Currently the province may well continue to lose more information through technological obsolescence, unauthorised access and hacking, viruses, disk crashes, and bit rot, as well as migration errors. Most of the strategies the province is using to preserve digital records are only meant for short to medium-term preservation. Digital records in the province are also at risk of becoming irretrievably lost. This would result from ignorance of the importance of preserving digital records together with metadata in its entirety, that is :technical metadata which gives a description of the physical attributes of digital objects, particularly for preservation and rendering; management or administrative metadata − which establishes the authenticity, rights, ownership, and provenance of the digital object; and discovery metadata −which helps to locate, access, and use digital content in the long term (Adu 2015:85).

   From the findings of this study, it can be concluded that Masvingo Province confronts the following challenges in its endeavour to preserve digital records:

- Weak legal framework.
- Lack of policies and guidelines.
- Paucity of standards.
- Lack of proper and infrastructure.
- Inadequate budgets and resources.
- Lack of digital preservation and technical skills among staff.
- Technological obsolescence.
- Virus and malicious software threat.
- Hacking and unauthorised access.
- lack of disaster management plans.
- Inadequate power supply.

**RECOMMENDATIONS**

❖ The current NAZ Act which is the legal framework for the management and preservation of digital records should be amended to give adequate and specific guidelines for the management and preservation of digital records. Alternatively, NAZ should design a digital preservation policy and guidelines that augment the Act, for the departments to follow as they execute digital preservation.

❖ The departments should draw up other documents, such as the ICT, retention and disposal, and access policies, as well as disaster-management plans. These instruments are crucial for digital records-preservation strategies and activities to be executed in compliance with legislation and archival best practices.

❖ Access, security and privacy issues should be thoroughly addressed through policies. The physical infrastructure and the computer systems should be tightly protected to inhibit hacking, unauthorised access, alterations and viral attacks on information.

❖ All digital preservation efforts should conform to standards for sustainability and effectiveness. Adhering to standards such as Records Management:ISO 15489-1:2016; Space Data and Information Transfer Systems − Open Archival Information System (OAIS) − Reference Model:ISO 14721:2012;Risk Management – Principles and Guidelines: ISO 31000:2012;Information Technology − Security Techniques −Information Security Management Systems − Requirements: ISO/IEC 27001:2013; Long Term Preservation of Electronic Document based Information: ISO/TR 18492:2005 and other relevant ISO standards is most recommended for preservation efforts to be in line with global trends and best practices.

❖ The departments in Masvingo Province should consider having special rooms and infrastructure for storage of digital records. Such storage facilities should control temperature, humidity, dust, and sunlight, for proper working of servers, and long-term storage and survival of external storage media.

❖ The computer system should also be connected to uninterrupted power supply (UPS).

❖ Substantial budgets should also be put in place to support digital preservation activities.

❖ Departments in Masvingo should consider using Trusted Digital Repositories (TDRs) which are compliant with the Open

❖ Archival Information System (OAIS) model (ISO 14721:2012).This model is an international standard that identifies processes and functions common to almost every possible digital preservation environment (Gracy 2008:36).TDRs can be audited to ensure appropriate performance and quality management; and they work well with software tools for digital preservation.

❖ The departments should make sure that their preservation systems capture all forms of metadata, that is, technical, management, and discovery metadata. Metadata is invaluable for guaranteed preservation, rendition, authenticity, easy location, access and use of digital records.

❖ The departments should also strive to perform migration by normalisation. This strategy involves the migration of the data file to a standard open-source format that is always available and accessible, and that promotes interoperability between differing systems.

❖ The use of cloud storage for less sensitive information may also be considered as a viable and cost-effective interim strategy.

❖ Substantial investment should be channelled towards improving staff skills in digital records management and preservation. The departments should consider funding continuous training of staff through workshops, conferences, short courses, and college or university programmes, with more emphasis on the practical side of digital preservation. Continuous training will equip staff with crucial digital preservation competencies such as refreshing, backup and byte replication, encapsulation, use of Application Programming Interfaces (APIs) and preservation file formats, which they can use where applicable to preserve and prolong the usability of digital records.

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