A FRAMEWORK FOR PUBLIC DIGITAL ARCHIVES ADMINISTRATION IN ZAMBIA: CURRENT PRACTICES, PROCEDURES AND PROSPECTS

BY

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DECLARATION

I, **Euphrasia Ng ‘andwe**, do hereby declare that this dissertation represents my own work, has not previously been submitted for a degree at this or any other university and that it does not incorporate any published work or material from another dissertation.

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APPROVAL

This report by Ng'andwe Euphrasia is approved as fulfilling the partial requirements for the degree of Master of Library and Information Science by the University of Zambia.

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DEDICATION

To my parents Mary Mtonga- Ng'andwe and Bernard Ng'andwe

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ABSTRACT

The aim of this study was to establish the framework for digital archives administration in Zambia, focusing on the current practices, procedures and prospects. A case study design using concurrent mixed research methods was adopted for this study. Purposive, and simple random sampling techniques were used to select 13 archivists and 30 users respectively. Data were collected using closed and open ended questions and scheduled interviews. Quantitative data was analyzed using statistical centrality, position and variability with aid of Statistical Package for Social Sciences (SPSS) Version 26 for descriptive statistics for easy interpretation and analysis of data, while content analysis was used to analyze qualitative data. The study established that the National Archives of Zambia was yet to develop standard procedures , manuals and policies for the adminstration of digital archives. Although, the National Archives of Zambia draws its manadate from the National Archives Act of 1995 CAP 175. Archivists indicated lack of digital skills required in processing digital skills. The study recommended that there was need to develop institutional policies and procedures to guide the process of digital archives administration, and revise the National Archives Act of 1995. In addition, there was need to train archivists in handling of digital archives. The study further recommended a model for adoption by the National Archives of Zambia.

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LIST OF ABBREVIATIONS

DRM	Digital Records Management
e- QMS	Electronic Queue Management System
EHR	Electronic Health Records
ERM	Electronic Records Management
ERMS	Electronic Records Management System
FEDORA	Flexible, Extensible, Duration Object Repository Architecture
ICT	Information Communication Technology
ILMS	Integrated Library Management Systems
IT	Information Technology
MoHA	Ministry of Health
NAPSA	National Pensions Scheme Authority
PMEC	Payroll Management and Establishment Control (PMEC)
RCM	Records Continuum Model
OAIS	Open Archival Information Systems
NASA	National Aeronautics and Space Administration
CCSDS	Consultative Committee for Space Data Systems (CCSDS)
DDC	Digital Curation Centre
UNESCO	United Nations Educational Scientific and Cultural Organisation
PREMIS	Preservation Metadata Implementation Strategies

METS	Metadata Encoding and Transmission Standard
XML	extensible Mark-up Language
DIRKS	Designing and Implementing a Records Keeping Systems
NOARK	Norsk Arkivisystem
NA	National Archives
DA	Delhi Archives
DRM	Digital Records Management
ANC	
UNRAA	Uganda National Records Archives Agency
NARSA	National Archives and Service of South Africa
USIU-A	United States International University Africa
PDF	Portable Document Format
DRGS	Directorate of Research and Graduate Studies
FOSS	Free/Open Source Software
CAP	Chapter

CHAPTER 1: INTRODUCTION

1.1 Overview

This chapter presents the background to the study, statement of the problem, the purpose of the study, specific objectives, research questions, significance of the study, limitations, conceptual/theoretical framework and operational definitions of key concepts.

1.2 Background of the study

Digitisation has brought in a new dispensation with a great deal of changes in modern business processes, communication, financial management and decision making (Asogwa, 2013). Digitisation is the process by which analogue content is converted into a sequence of 1s (ones) and 0s (Zeros) and put into binary code to be readable by the computer. This includes electronic snap shots taken of a scene or documents. The digitisation process entails transforming a physical object (analogue content) by taking photographs or scanning the item and transferring it into a digital medium. It is also a process of archiving born digitals into institutions collections (Asogwa, 2011). Tsvuura & Ngulube (2020) note that the digitalised content can be in form of text, images, audio or multimedia. The concept of digitisation includes both electronic resources (born digital) and converting archival collections. Digital archives, while fulfilling the same general business purposes as paper records are inherently different from their paper counter parts. The most obvious difference is that digital records are mediated by technology which means that to experience digital records a person must have a right combination of hardware and software (Helsp, Davis and Wilson 2002).

The development of archives administration systems can be traced from the primitive drawing of pictures on the walls of caves to depicting events, to recording events on paper, to document image processing and electronic records management. The task of managing documents goes far back, even before beginning of civilization (Adam, 2008). It is important to note that the development and use of application software's on personal computers, letters, memos, and reports were created electronically to facilitate the creation of paper documents. Until the 1950's when computers were first used in business, archives were almost entirely paper or physical. The most important emphasis during this stage in history was getting the records properly placed in the files, emphasis

on retrieval only resurfaced later. According to Reads and Ginn (2011) little importance or status was granted to archives administration functions. However, the traditional approach to archives administration has been greatly challenged by the evolution of document management strategies that have been largely driven by technology (Ngulube, 2011). Archives management technologies have evolved from paper to microfilm through digital and optical objects. With the advancement in technology, true digital records are now in use; i.e. records created, distributed, used, and stored in electronic form.

Although the process of digitising an institution's archives maybe considered a costly venture, it has a number of benefits, digital collections can be read, reformatted, compressed, transferred and retrieved over computer networks (Asogwa, 2011). It can be accessed over the internet simultaneously by million users in different locations without degradation of the contents and it can also be copied limitless times with just a click on the computer mouse. In addition, it provides a backup storage media facility in case of disaster; it provides protection and security for the documents; improving access and usability, and reducing handling of original materials saves storage space for the organisation (Tsvuura & Ngulube, 2020). Consequently, digital archives increase the productivity of an organisation and over all organisational performance depends on how well information is managed (International Standards Organisation, 2001). This is why Governments and various organisations all over the world are increasingly recognising the importance of managing digital records for good governance.

Thus, management of electronic information has emerged as a major issue for public institutions and information managers (Hamooya, Zulu & Njobvu, 2011). However, it should also be noted that the success of any digitisation process depends on a well-planned and prepared road map (Tsvuura & Ngulube, 2020). Information management institutions such as libraries, museums, information and archival centres have in the past undergone transformation from the traditional manual way of managing analogue records and archives to now the digital format (Mclead and Hare, 2006). However, the administration of digitalised archives require appropriate management, legislation policies, procedures and guidelines and trained persons to attain success (Tsvuura and Ngulube, 2020). Many countries have national archives to store important records, and some also have regional and social archives.

In Zambia, archives administration is the mandate of the National Archives of Zambia (NAZ) a department under the Ministry of Home Affairs. This mandate is derived from the National Archives Act Chapter 175 of the Laws of Zambia, 1995 edition which provides for the preservation, custody, control and disposal of public archives including public records in Zambia (Hamooya, Mulauzi, and Njobvu, 2012). The National Archives of Zambia, commenced its digitization project in 2005 with the aim of safeguarding and ensuring the preservation of most valuable and perishable archives and to enhance their accessibility. Further the organization had wanted to enhance access to the archival collection and improve the institutions services. For those documents that were mostly on demand, it was hoped that the digitization project would help to reduce the handling and use of fragile and heavily used original materials.

As such, a team was constituted that included consultants to spearhead the digitization project. The digitized archives included; District Notebooks from 1896 to 1964, British South African Company files from 1896 to 1924, historical maps from 1600 to 1990, photographs from 1920 to 1994, Stamps from Colonial to 2004 and Mutende newspapers 1936 to 1958, (National Archives of Zambia Report:2022). After the completion of the project, the digitized archives were handed over to the institution and were further incorporated into the collection and made accessible to researchers through local computer networks. However, the archival collection that was digitized during this period only characterized a small portion (about 10 percent) of the entire collection of the entire collection with majority 90 percent of the collection which are yet to be digitalized to date. A number of challenges were faced with by the institution during the digitization process. For instance, the institution was faced with understaffing which meant that the staff that was available during the digitization project had other jobs and hence could not take part in the technical aspects of the digitization process.

1.3 Statement of the problem

Management and administration of digital archives program involves the development of policy frameworks, and standards covering all areas of operation. In part it involves the ongoing supply of appropriate resources and infrastructure including suitable technical systems and in part management processes such as monitoring and reporting on the program, (National Library of Australia, 2003). However, despite the efforts to digitize part of the archival collection at the

National Archives of Zambia in 2005, the problem faced by the institution is that, there are no institutional structures and policy frameworks to support the administration of digital archives. As such, the institution lacks standard procedures for processing digital archives which in turn affects the effectiveness of the process of digital archives administration. Therefore, this study was undertaken to establish the framework for the administration of digital archives at the National Archives of Zambia focusing on the current practices, procedures and prospects.

1.4 Purpose of the Study

To establish the current practices, policies and procedures for the administration of digital archives at the National Archives of Zambia.

1.5 Research Objectives

The following objectives guided the study:

1.5.1 General objective

To investigate the current practices, standard procedures, policies and guidelines adopted for managing digital archives.

1.5.2 Specific Objectives

The specific objectives of the study were:

1. To explore the current practices and procedures employed in the administration of digital at the National Archives of Zambia.
2. To explore the legal and policy framework underpinning digital archives administration at the National Archives of Zambia.
3. To establish challenges affecting the effectiveness of digital archives administration at the National Archives of Zambia.

4. To determine strategies for effective digital archives administration at the National Archives of Zambia.

1.6 Research Questions

This study was guided by the following research questions:

1. What are the current practices and procedures used to administer digital archives at National Archives of Zambia?

2. What legal and policy framework support the implementation of digital archives administration at the National Archives of Zambia?

3. Are there any challenges affecting the process of administration of digital archives at the National Archives of Zambia?

4. Which strategies can be put in place to enhance the administration of digital archives?

1.7 Limitations of the study

A number of limitations emerged during the course of data collection during this study. This is because, the study was undertaken during the Covid 19 third wave period in 2021 that affected institutional operations country wide. Therefore, it was difficult to conduct face to face interviews with most respondents and as such, phone interviews and online questionnaires were used in some cases to collect data.

In addition, collecting data from other provinces using the online questionnaires was also difficulty as in most cases respondents took long to respond and send back the answered questionnaires. The researcher instead had to resort to conducting phone interviews to ensure that maximum participation was achieved.

Data collection from the Users was equally challenges as there was a poor turn out of users at the Library at the time. As such, the period for data collection had to be extended in order to meet the target number of users that were targeted for the study.

1.8 Significance of Research

According to the Public Service Records Management Policy (2012), records are fundamental to democracy and national development, as recorded information underpins the protection of Human Rights, the rule of law and equal treatment of citizens as well as measures in social economic development. Digital archives management in organizations has continued to affect the handling and distribution of information in most public as well as private institutions in Zambia and world over. This is because the world has evolved and the rate at which information is being generated maybe faster than the rate at which is processed. Organizations aim at achieving competitive advantage and attaining overall business success. Therefore, need for effective means of managing archives in organizations has also arisen. The information generated from the findings of this study may influence policy makers in addressing information related issues and evaluating the effectiveness of the policy frameworks governing its management in a digital culture. The findings of this study will also contribute to the body of knowledge on which further debate can be based. It will also inform archivists and records managers at the National Archives of Zambia on the issues surrounding digital archives administration.

1.9 Theoretical Framework

For many years' models and theories are used interchangeably. However, they also argued that this is not supposed to be the case because models are partial representation of theories and cover an aspect of theories. A theory on the other hand, where as a concept can be derived from a given model, a theory can be said to be a set of concepts used to explain a given phenomenon (Silverman, 2000). Models convey a mental image of phenomena or the real world and very often leads to the formulation of theories which may be used to describe a phenomenon.

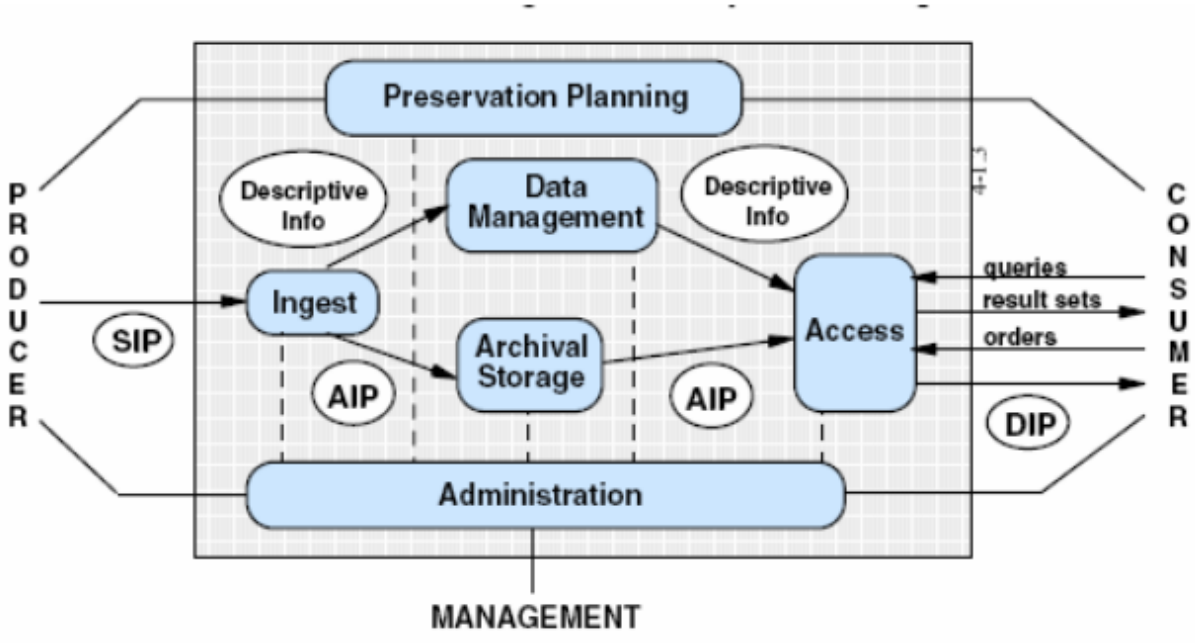
This paper adopted a combination of both models and frameworks to anchor the study. The Open Archival Information System model and the Digital Curation Centre Model life cycle because they raise critical issues and variables to this study.

Open Archival Information Systems Reference Model (OAIS)

The OAIS is the most widely used reference model in the development of digital libraries, digital archives, digital repositories and record keeping. The OASI was proposed by the Consultative Committee for Space Data System(CCSDS) and linked to the National Aeronautics and Space Administration (NASA) in the USA. Subsequently the model was adopted as an ISO standard for long term preservation of digital documents (ISO14721:2003). Although it originated from space research, the OAIS reference model is a general theoretical model describing the organisation of an archive. Focus in the OAIS model is on three parts including, the description of the external environment within which the OAIS operates, the second part of the functional components which fill the OAIS preservation responsibilities and the third component which describes the information objects which are ingested, managed, and disseminated by the OAIS (Cunningham,2008).

This study was built around the six-level components of the OAIS model undertaken together to constitute the mechanism by which the digitisation information is preserved and made available to a designated community.

Figure: 1 Conceptual Model of the OAIS Reference Model.



Source: (CCSDS,2002)

They include;

1. The ingestion or the process responsible for accepting information submitted and preparing it for inclusion in the archival store
2. The provision of the portion of the archival systems that manages the long term storage and maintenance of materials
3. Data management; maintaining databases of descriptive metadata identifying and describing the archived information in support of the OAIS's finding aid.
4. Access: helps the consumer to identify and retrieve information.
5. Administration; is responsible for managing the day to day operations of the OAIS; and preservation planning; provides recommendations for conversion, migration and monitors changes in technology.
6. Preservation strategy, as well as recommending appropriate revisions to this strategy in response to evolving conditions in the OAIS environment

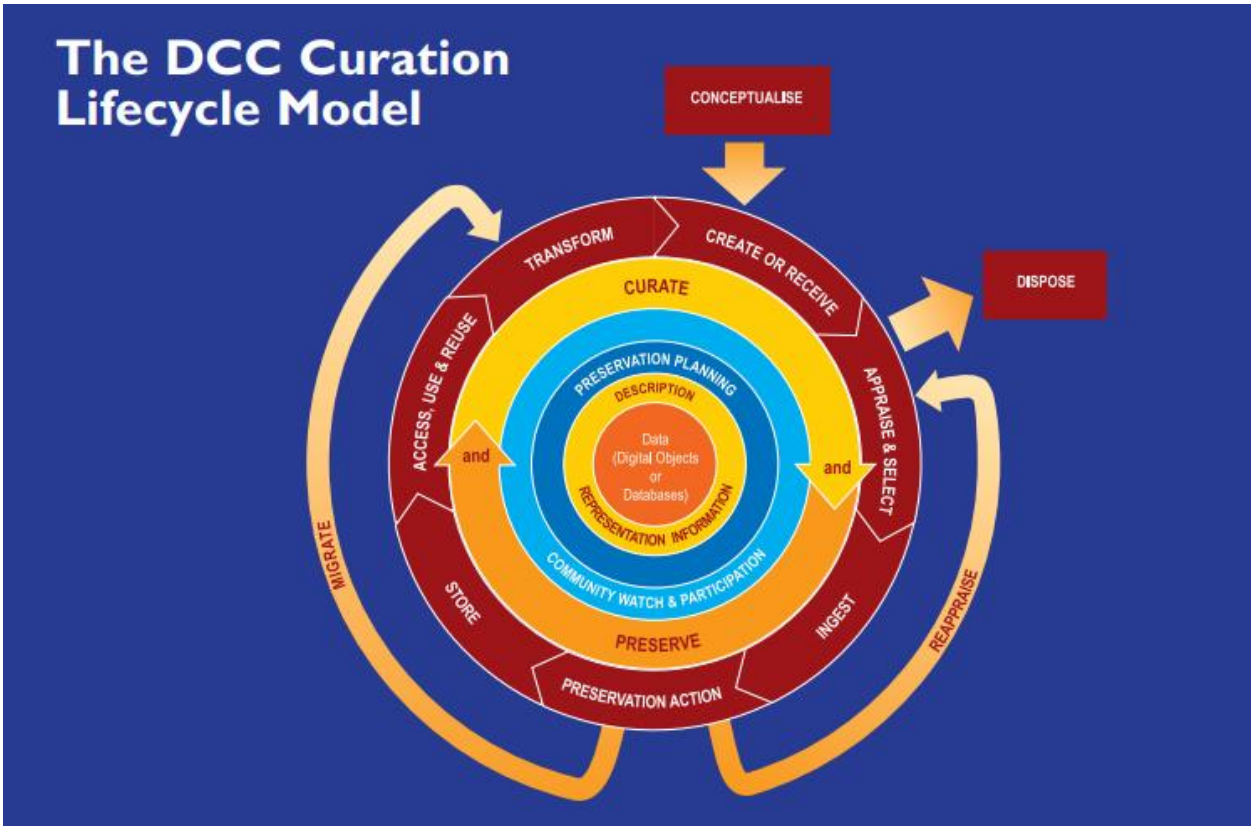
The six components of the OAIS model provides a common understanding of what it is that archives do when they preserve digital records. The model further gives important impulses to move towards greater standardisation in the field of digital archiving, including the development of criteria and procedures to analyse and asses digital archival and dissemination practices. These provisions are important for preparedness towards digital archives management. However, in spite of the influence nature of the model within the archival community, the model has been criticised for its costly nature in terms of money, and the potential danger of losing data during the migration process.

Digital Curation Centre (DCC) Life Cycle Model

The Digital Curation Centre (DCC) offers a graphical high level overview of the lifecycle stages required for successful digital archiving proposed Higgins in 2008. The model applies to both simple and complex digital objects, (Odhiambo, 2018). Simple objects are discrete digital items such as textual files, images or sound files along with their related identifiers, while complex digital objects are discrete digital objects made by combining a number of other digital objects such as websites. It ensures that all the necessary stages

undertaken are in the correct sequence. The model enables granular functionality to be mapped against it; to define roles of responsibility and a framework of standardising the process of identifying additional steps which are not required by certain situations of disciplines and ensuring that processes and policies are adequately. The model explains the three components that characterises this model including; the life cycle actions that describe and represent information, plan for preservation, maintain appropriate community activities and participate in the development of shared standards, tools and suitable software and promote curation and preservation throughout the curation cycle. The three stages are shown in the figure below:

Figure 2: The DCC Curation Lifecycle Model



Source: www.dcc.ac.uk

Secondly, the sequential actions that conceive and plan the creation of data, including the creation of data, preserve metadata, receive data in accordance with documented collecting

policies from data creators, other archives, repositories or data centres and if required assign appropriate metadata.

The sequential actions also ensure that they evaluate data and select for long term curation and preservation, transfer data to an archive, repository, data centre or other custodians, ensure long term preservation and retention of authoritative in nature of data by adhering to authenticity, reliability, and usability while applying relevant standards.

Occasional actions that ensure the disposing of data which has not been selected for long term preservation in accordance with documented policies, guidance or legal requirements, re-appraising the data which fails validation procedures for migrating data to a different format. The key components of the DCC provides a generic graphical high level overview of the stages required for successful management of digital materials from initial conceptualisation.

Application of the models to the study

The OAIS model was used in this study because it provides guidance and the criteria of what it takes to plan for digitisation project in an organisation. It has provisions for planning, and making recommendations for conversion of digital objects format, and or migration from one software to another and is able to monitor changes in technology which is a very key aspect of ensuring continuity and access to digitised archives. Studies have argued the challenges of technology and its short life span in terms of performance due to the presence of new advanced systems a software's and applications all the time. While the Digital Curation Centre(DCC) Life Cycle Model was adopted because of its application to administration of digital objects. The DCC focuses on the stages that a digital object undergoes from creation stage. It prescribes three key components through which action is taken when managing digital archives. These are actions that describe the present information, sequential actions that describe and represent information, plan for preservation, maintain appropriate community action and evaluate data and select for long term curation and preservation and occasional actions that ensure the disposing of data. The model can be used to plan digital archiving activities to ensure sustainability of digital material, hence ensuring that the institution prepares adequately for digital archiving. The model is useful as an institutional planning tool, it is adaptable to different domains and extensible to allow curation and preservation activities to be planned at different

levels of management. It can be used to define roles and responsibilities, build frameworks of standards and technologies, and ensure that processes and policies are adequately documented.

The two models therefore, provides basis to anchor this study because each model has a unique aspect that makes them relevant to digital archives administration. Besides the contribution of the OAIS model to planning for successful management of digital archives and implementation it goes further to conceptualise the layout of a digitisation system form the point of ingestion to the point where users can access the digital archives. The DCC life cycle model further adds a framework also to determine standards and procedures that can be developed to guide the administration of digital archives. Therefore, the two models as presented and discussed provided a benchmark on which the findings where compared to determine the best practices managing digital archives at the National Archives of Zambia.

1.10 Operational definitions

The operational definitions for the key concepts in the context of this study are outlined below;

Digitisation

Conversion of hardcopy or non-digital (analogy) records into digital format that can be processed by a computer (Jaswal, 2016).

Archives

Archives include all public records which are considered as being enduring or have historical value (National Archives Act of 1995).

Digital archives

Digital archives are the analogue archives materials converted into machine readable format using the digitisation equipment, standards and techniques with the purpose of preservation or to make them the purpose of preservation or to make them accessible to users. The term may also be used for both the born-digital information and the information preserved in the same format for its archive value

Framework for administration of digital archives

The framework for administration of digital archives include; a set of assumptions, concepts, values, policy statements, records legislation, records standards practices, guidelines and manuals, codes of best practice that constitute a way of viewing reality (Jaswal, 2016).

1.11 Summary

This chapter gave an overview on the study highlighting what has been done so far in terms of digital archives administration world over, the problem was established including the study outcomes, research question, limitations, significance of the research, theoretical framework of the study and operational definitions**.** The next chapter will review empirical literature from across the globe that has been documented on the subject under investigation.

CHAPTER 2: LITERATURE REVIEW

2.1 Introduction

This chapter presents an empirical review of studies that were conducted to establish the frameworks for digital archives administration at the global, regional and local levels. The chapter is organized into themes generated from the objectives that guided the study; current practices and procedures for digital archives administration, policy and legal framework for archives administration, challenges affecting effective administering digital archives and strategies for improving the administration of digital records.

2.1 Digital Archiving Management

The phrase digital archive is often misused and or hijacked, and that this misuse obscures fundamental issue associated with the capture and long-term management of archival resources (Cunningham,2008). Basically, archiving is the management of archives and records. Digital archives can be distinguished from digital libraries and museums because archiving ensures that records which have value as authentic evidence of administrative, corporate, cultural, and intellectual activity are made, kept and used. In the recent years, a lot of efforts have gone into preservation of digital objects. Digital archiving requires active archival intervention across the entire records continuum. Cunningham, (2008) argues that it cannot just be an end-of-life- cycle collection management. Archivists, document recordkeeping activity so that valuable records can be made available for future wider use in ways that their meaning and utility persist. The peculiar challenge of archiving is developing and implementing strategies for preserving the evidential meaning of records by capturing and preserving records in context.

Digital archives management systems should ensure the effective capture, maintenance and retrieval of records and are supposed to maintain the characteristics of a record that are: authentic, reliable, complete, and have integrity (Svard, 2017). Sutirman, etal (2017) identified electronic scanning and electronic records management software as examples of digital management software that can used to handle a digitization project.

2.2 Current practices and procedures for digital archives administration

Archives administration practices and procedures ensure that appropriate attention and protection is given to all records and archives and that the evidence and information they contain can be retrieved more efficiently, using standard practices and procedures (ISO 2001). Taking custodial control of digital materials requires a set of procedures to govern their transfer into a digital preservation environment. Standards should be seen as a formal description and recognition of what a community of experts might term best practices. Standards provide a framework within which the digitised archives should be managed using internationally best practices.

This section, reviewed literature with focus on current practices, standard procedures and manuals used to manage digital archives.

2.2.1 Metadata Standards

Internationally, a number of standard procedures recognised and regarded as international best practices have been developed to guide the management of digitized archives.

AS 4390: Cunningham (2008) reports that in 1996 the Standards Australia (AS) published the world's first national standards for records management, AS 4390. This standard was a result of a truly national collaborative effort which later provided basis for the later standard ISO standard ISO 15489. This standard however, is a general guide for the management of records. ISO, (2010; 2012) further documents more standards that can be used to manage digital archives and preservation of digital records. ISO 13008:2012 is a standard that specifies the planning issues, requirements and procedures for the conversion or migration of digital records (which include digital objects plus meta data) in order to preserve the authenticity, reliability, integrity and usability of such records and evidence of business transactions. While, ISO/TR 13028: 2010 was developed on information and documentation implementation of records establishes guidelines for creativity and maintaining records in digital format only. Where the original paper, or other non-digital source record, has been copied by digitising, established best practices guidelines for digitisation to ensure the trustworthiness and reliability of records and enable consideration of the disposal of the non-digital source records. It also establishes best practices guidelines for the accessibility of the digitised records as long as they are required, specifies strategies to assists in

creating digitised records fit for the long term retention, and establishes best practices guidelines for the management of non-digital source records following digitisation.

2.2.2 Metadata and File Formats

Ravio, (2005) reviewed were technical standards in relation to metadata and file formats. The study pointed out PREMIS and METS which are in practice standards which will enhance a digital preservation programme. PREMIS (Preservation Metadata) is a standard hosted by the Library of Congress and was first published in 2005. METS (Metadata Encoding and Transmission Standard) is an XML encoding standard which enables digital materials to be packaged with archival information. Standards relating to file format include; those that are non-proprietary and based on open format standards which gives an organisation a good basis for a digital preservation programme.

2.2.3 Standards, procedures and guidelines

A report by Raivo, (2005) gave an overview of current research and practices in digital preservation of records in different states. The report established that the National Archives of Canada was probably the first to issue clear requirements for electronic documents and records management system used in the government agencies. The report further noted that the National Archives of Australia maintained an online manual on Designing and Implementing a Records Keeping System (DIRKS) methodology. The DIRKS methodology provides guidelines on functional analysis and classification, and guidelines for archiving web based records. In addition, the report established that the Norwegian freedom of information Act of 1969 made it mandatory for all government agencies to make diary systems publicly accessible. Consequently, the first version of the NOARK standards (Norsk Arkivisystem). Moreover, The Swiss Federal Archives developed a core data model for automating the registry plan in the way that meets the archival requirements in the electronic environment under the project called Geschaftswervaltung-GEVER, which was a project between the Federal Archives and the Federal office for information. The report concluded that most national archives have only a few digital records in their collections since the bigger wave of electronic documents and records is still widely held by agencies. It should be acknowledged that the report provides a sound overview for countries that have developed and implemented standards for managing digital archives on which a benchmark could

be conducted. However, mainly the focus was on western countries and nothing on African countries was documented in this regard.

Another study in India by Ahmed and Sharma (2021) analysed methods, standards and protocols adoption in the process of digitisation to highlight how it can be sustainably preserved and provide access to archival resources. Their findings revealed that none of the archives National Archives of India (NA) and Delhi Archives(DA) uses any protocols for search and retrieval of records of re-use digital records at the client level. The study concluded that large scale digital archives may be different for each archival institution depending upon their collection, available technologies and funds, user demands etc. However, these projects need to have detailed documentation of digitisation policy and digital collection development to make them sustainable and successful. The recommendation from the study indicated the two major archives in India should share their digitisation strategies and in the development of best practices with other archives which are in the process of digitisation in order to adopt uniform standards of the digitisation process, metadata creation, and retrieval of records.

Studies reviewed in this context have highlighted what is currently prevailing in other parts of the world both globally and regionally. The section highlighted some internationally accepted standards and practices world over. Although, there was not much literature available in the African and or Zambian context on this subject. However, In Zambia, no study so far has been conducted to establish the current standards and practices for managing digital archives at the National Archives of Zambia. The importance of adopting or developing protocols to guide the process of digital archives administration in this context cannot be over emphasised.

2.3 Policy and Legal Framework for archives administration

A legal and regulatory framework reflects how an organisation intends to manage its records and archives. Luyombya (2010), also states that formal instruments such as policies and regulations are key in determining factors for the successful creation and management of digitised records and archives. Legislation is a means of laying down of instructions to the persons responsible for running a government in order to properly discharge each function of government. Legislation provides for the powers, obligations and limits of each institution. Up to date records and archives legislation is a critical prerequisite of effective life cycle for records and archives management

(Hamooya, Mulauzi, and Njobvu, 2011). This is because it establishes the framework for creation of appropriate records and archives systems and provides autonomy for their implementation. In this vein it is therefore, the mandate of government to ensure that legislation is in place to support records and archives administration and legalise all operations of archival institutions. This is why most governments have since reviewed and amended their archives legislation to accommodate emerging issues such as administration of digital archives in the quest to enhance accountability and transparency in public institutions.

Luyombya (2010) in Uganda, established that problems with DRMs are largely due to the absence of ICT facilities, a lack of clear policies guidelines and procedures and the fact that the Uganda Records and Archives Legislation are not fully implemented and not fully enforced. This has led to the lack of appropriate institutional and managerial structures. The study recommends the need for formal legal infrastructure and the need to establish formal instruments in particular a national archives policy, procedures and guidelines. However, Loyomba and Sennabulya (2012) revealed that one of the significant developments in the history of Uganda was the enactment of the National Records Management Act in 2001 to rationalize the records and archives management function under a single authority. This provided for the establishment of a Ugandan National Records and Archives Agency (UNRAA). As a key component of the infrastructure to manage public archives. Among the key functions stated in the Act was to ensure that the organs of the state followed good practices in managing public records containing information in all media or formats, including those in electronic forms. However, the study concluded that the UNRAA had not yet been established from the time the Act was enacted in 2001. As such the provisions of the Act were yet to be realized because they were seen to be dependent on the building of a new repository and offices for the Agency in Central Kampala which had not yet commenced.

Ngoepe (2017), reports that some public entities in South Africa have implemented digital records systems over a period of 20 years. However, the findings revealed that there was need for these entities to transfer the records into archival custody in line with the legal framework. Moreover, the study observed that there was a consensus among researchers that there was no infrastructure to ingest digital records into archival custody in South Africa. As such, it was recommended 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 Service of South Africa

(NARSSA) was also encouraged to develop a policy on distributed custody to allow government entities to create interim solutions for the preservation of digital records. The study concludes that both public entities and NARSA should invest in capacity building, including training and provision of sustainable infrastructure required to preserve digital records.

Tsuvuura and Ngulube (2020) evaluated the legal and statutory frameworks for managing the digitization of records and archives in two state Universities in Zimbabwe. The study established that there was a lack of enforcement of policies and standards. However, Smith (2008) emphasizes the need for organizations to put records and archives management policy statements in place that is endorsed by top management and made available to members of staff. The records and archives policy should provide a system that meets the organizations business needs, and addresses the organizations stakeholders needs and conforms to relevant legislation, regulations and standards.

Hamooya, Mulauzi, and Njobvu (2011) established that many countries have reviewed and made amendments to their archives legislation to accommodate emerging issues such as management of electronic records. For instance, the National Archives and Records Service of South Africa was amended in 2001 to provide for the management of electronic records. Similarly, Namibia has an e-governance policy for Public Service of Namibia (2005) and the Archives Act (1992). However, Hamooya, Mulauzi, and Njobvu (2011) also noted further that the case is different in Zambia. They established a gap and noted that the National Archives of Zambia Act in the context of electronic records and archives has not kept pace with the rapid changes in information technology. The focus in this Act is solely based on paper documents. As such, the functional provisions of the National Archives of Zambia are somehow constrained by the existing legislation.

A gap was established in the literature reviewed in this section regards the current state of affairs in Zambia. While it has been acknowledged that a number of studies reviewing legal and policy framework from global perspectives, the Zambian context is not exhaustive as so far, as no study has been done to review institutional policy frameworks governing the administration of digital archives at the National Archives of Zambia so far.

2.4 Challenges affecting effective administering digital archives

This section reviews literature highlighting some challenges that affect the effective administration of digital archives;

2.4.1 Lack of digital repositories and software

Alkhofani, et al. (2019) argues that the lack of a universal Electronic Records Management Systems (ERM) that can be effective for all fields was a major challenge in managing electronic records. This is because each ERM is designed with a specific framework and parameter that is suitable to fulfil a specific need. For example, the Electronic Health Records (EHR) developed for managing medical records based on specific health frameworks hence it cannot be suitably or alternatively applied in other fields such as financial or government records. The implication in this instance is that different functional departments need a more specifically tailored ERM for managing their digital records and archives which makes its implementation totally difficult to undertake. However, this still remains a subject for debate as different fields have certain policies that must be applied when dealing with management systems. Archives and libraries too have their own policies that need to be followed when creating and managing digital records which may not apply in other fields.

Jaswal, (2016) gives a comprehensive discussion of the digitisation process in Pakistan Libraries highlighting, its issues, challenges and constraints The study reports that libraries in Pakistan together hold enormous number of archival information in analogue print formats which are deteriorating and destroying with time. Digitisation of these resources is an essential process to publish them online and facilitate remote access to users. However, there is a danger of loss of all the efforts of scanning if at the time of building an online repository in the future, the quality and types of formats of digital images, does not comply with the standards of online storage and display. The study recommended that the development of a digital repository software and Optical Character Recognition (OCR) software in local languages should be developed to digitise local information and to provide search and retrieval services.

2.4.2 Lack of adequate funding and infrastructure

Alkhofani, etal. (2019) observed that most countries in the developing world especially those in the Arab world typically lack behind in the effective implementation of digital archives administration. The most prominent challenges faced by these countries are mainly financial as reported, and technical limitations. In addition to setbacks to effective digital records management such as the lack of digital records management policy, lack of funding directed towards proper digital records management, staff lack of prerequisite knowledge and skills in records management, and inability to keep up with constantly evolving technology. However, Katherine (2017) argued that records management professionals overwhelmingly feel requirements, organizational culture and behavior form a barrier to implementing successful records management programs.

Similarly, Domrzalski (2018) in the Midwest, observed that digital preservation was more likely to be supported using various funding sources as opposed to sole reliance on the library operation budget. The study concluded that a uniform solution, achievable across the spectrum of actual repositories is unlikely to materialise. This was attributed to the fact that digital preservation infrastructure and workflow depend upon available resources. The study did not recommend specific tools and infrastructure but their emphasis was on the different institutional contexts which archivists work as well as appropriate solutions to these contexts.

In Kenya, Ddhlambo, (2018) assessed the readiness of the United States International University-Africa (USIU-A) to manage digital archives at the institution. It was established that the infrastructure required for digital archives management was not up to standard. In conclusion it was established that although USIU-A had taken steps towards digital archives management, more still needed to be done to for the institution to effectively manage its digital archives.

2.4.3 Difficulty in maintaining the original value of primary sources

Davis-Perkins etal (2005) examined the effects of digitization on the primary sources, their digitized surrogates and the relationship between the two in terms of selection, authenticity and representation. The findings of the study revealed that digitization was not living up to its

expectations, and was adding yet more stress into the management of historic collections. Evidence from this study show that there are inherent problems with keeping the same level of value in a digital surrogate, in that the processes of reproduction always changes the materiality of the object that has been reproduced. Although the use of digital editing is widespread amongst technology practitioners there is not always a record kept of the changes made and the extent to which manipulation is acceptable. Some of the challenges faced by archivists when digitizing objects were, lack of adequate funding, authenticity and representation. Although digitization projects were seen to be mostly hindered by lack of funding, evidence strongly suggested that it was the artificiality of deadlines and outcomes imposed by short term projects that caused the problems more than lack of resources. Therefore, the study recommended that in order to successfully merge public access and commercial expediency with promoting heritage collections, there is need to be less techno-centric. And more worrying about what stake holders actually needed, and how technology could be made to meet those needs.

Similarly, Helsp, Davis and Wilson (2002) adds to the challenges of digital archives administration and state that while preserving the source of digital content is possible, preserving the process of administration is unrealistic because of the dynamic nature of the IT industry. This is attributed to the fact the industry has been rapidly expanding and developing over several decades, coupled with huge changes in hardware and software capabilities and the infiltration of computers into work and home life. They note that technology cycles are short, therefore, product lifetime also tend to be short. The implication of this largely market driven instability are twofold: rapid decay and technological obsolescence. Storage media such as disks, tapes, and cartridges decay relatively rapidly compared to other media as they are not designed for long term use and are therefore extremely susceptible to short and medium term decay.

2.4.4 Complex nature of digital archives

Anbu and Chibambo (2009) took stock of various preservation problems and challenges faced by different types of digital materials to ensure permanent accessibility of resources by present and future generations. According to the findings revealed by the study, digital preservation possesses challenges fundamentally different from the traditional materials mainly due to varied and complex nature of digital resources. The study concluded that there is need to develop a national

digital preservation framework to protect the current digital information resources for future access and use.

2.4.5 Lack of training in handling digital archives

Nechakuma (2018) revealed that the ANC archivists were not trained on digitised archives systems. Instead they relied on donor assistance from Multi-Choice and Africa media online in developing the digitisation infrastructure. The study concluded that archival institutions should collaborate and form partnerships, and the exchange programme should be encouraged among archival institutions.

2.4.7 Lack of awareness about digital archives

Hamooya, Mulauzi and Njobvu (2012) assessed the utilisation of digitised archival information by researchers at the National Archives of Zambia. Findings showed that all while the researchers were able to access digitized information at the National Archives of Zambia, they did not know initially that most of the historical information was digitised. The study concluded that the provision of digitised archival information was important as it allowed access to required information effectively and efficiently. As such, it was recommended that National Archives staff should guide researches by providing a comprehensive list of digitised content and is available to researchers to access. In addition, a guide or manual on digital information should be availed to researchers especially those using the National Archives for the first time.

Although a study by Hamooya, Mulauzi and Njobvu (2012) was done at the National Archives to assess the utilisation of digitised archives, it did not highlight the challenges of administration of digital archives as the focus was different from this study. Hence there was need for deliberate efforts to undertake a study to look into the challenges of digital archives administration.

2.4 Strategies for effective administration of Digital Archives

2.4.1 Activism through the Auditor Generals Office

In another Report by Cunningham (2008), one of the strategies that has worked for the National Archives of Australia is a single factor in getting the Australian government agencies to take recordkeeping seriously has been the activism of the Auditor-General. Auditors are natural allies

for archivists, because they understand the importance of good records. As such heads of state agencies pay attention to published audit reports much more than they will ever pay to the messages coming out of the National Archives. As such, the combination of agency readiness to transform record keeping systems from paper to digital and the heightened administrative attention being given to record keeping has now made record keeping one of the major topics of bureaucratic discussions in Australian Public Service.

2.4.2 Factors for implementing a successful digitization project

Bigirimana, et al. (2015) on the other hand pointed to a number of important aspects to consider in order to effectively administer digital archives. They include classification and indexing of electronic documents for easier retrieval, disaster preparedness and recovery, and effective electronic backup systems. In addition to existing policies and procedures for access.

Smith (2007) also adds that archives administration should be implemented in line with certain principles to achieve the desired objectives. As such, ten (10) significant factors paramount for ensuring success in the implementation of Digital Records Management (DRM) have been identified according to Alkhofani, Yusof, et al. (2019), i.e. top management support, implementation team and user involvement, policy and procedures, training, adequate budget, communication and willingness, ease of use, IT infrastructure and technical support. The factors are further grouped into four main categories; project management factors, organizational factors, human resource factors and technology factors as summarized in the table below:

Table 2.1: Categories of factors influencing successful implementation of Digital Records Management

Categories	Factors
Project management	• Management support • Implementation team • User involvement
Organizational factors	• Policy • Procedures • Adequate budget
Human resource	• Training • Communication • Willingness
IT infrastructure	• Ease of use

The assumption is that proper coordination of these factors identified would lead to successful and effective implementation of DRM. However, the limitation in this study is that the research design used was purely based on secondary sources of data, this could limit the extent and context in which the generalization of findings can be established. The study could have included primary data as well to validate the findings. Nevertheless, the articles reviewed were adequate enough to give value to the study and to guide professionals in the implementation of digital archives and records management and be able to compare and make conclusive statements.

2.4.3 Developing Strategic Plans

Alkhofani, et al. (2019) also emphasizes the need to develop strategic plans to overcome barriers in order to be applicable in the field of Digital Records and Archives Management (DRM). More consideration should be given to funding DRM projects as well as the provision of adequate information and technology (IT) infrastructure and training in order to ensure effective DRM implementation. This however, may call for innovativeness and creativity in mobilizing of resources in order to ensure that the digitalization projects are successful.

Moreover, Mulauzi, Wamundila, Mtanga, and Hamooya (2012), emphasized the need for organizations to invest in skilled e-records and archives managers for effectiveness. This is in line with Cunningham (2008) who argued that traditional skills and training on their own do not provide adequate preparation for the challenges of digital archiving. The skills set required for effective e-records management include, records and information management skills, managerial skills, and project management skills. These need to be complemented by knowledge of the e-records environment; knowledge of e-records management practices and trends; knowledge of the types of electronic records including web pages; and knowledge of IT applications to records and archives management.

Records managers and archivists need to be strategic to ensure that they devise strategies to harmonies the two systems. Finally, records managers in Zambia should consider adopting contemporary records management practices in order to effectively manage organizational records in various forms. This study is in agreement with the findings as presented by, Mulauzi, Wamundila, Mtanga, and Hamooya (2012), who noted that there is need to change the culture of records managers and archivists who are more inclined to managing traditional print documents so that they can embrace the evolving trends that now demand for management of e-records and digital archives.

Although studies reviewed show the need for culture change and adoption of new skills set for records and information officers, there is still a gap at implementation stage which needs to be addressed in terms of management of digital records and archives.

2.5 Summary

This chapter reviewed literatures from across the world which was organized under given themes. It was evident that there is a gap in information regarding the effective implementation of digital archives administration more especially in Zambia. Where very few studies on digital archives administration have been undertaken. Although the Zambian government has embarked on the implementation of e-governance systems with some sections of the public sector already implementing e-records management systems. However, not much documentation has been done to establish the framework under which digital archives are currently administered in Zambia. This has prompted the need for this study to be undertaken to establish how the National Archives of

Zambia which is statutory body mandated with the responsibility of managing public records and administering archives has aligned itself in implementing digitization systems and structures to support government initiatives. This therefore, justified the need for a study to be conducted and inform records managers and archivists including other information management professionals of the current trends in managing digital archives.

CHAPTER 3: METHODOLOGY

3.1 Introduction

The previous chapter explored different related empirical studies conducted globally on the subject administration digital archives with a focus on the current practices, procedures and prospects.' This chapter covers the following sub sections; research design, study population, study sample, sampling techniques, data collection instruments data collection procedure and data analysis instruments procedures and ethical considerations.

3.2 Research Design

Research designs are plans and procedures for research that span the decisions from broad assumptions to detailed methods of data collection and analysis (Creswell, 2009). The study was underpinned on the ontological worldview adopting the pragmatism world view because pragmatism is primarily empiricist and inductive, testing hypothesis, prioritising experience although not assuming that facts exist and are waiting to be discovered (Goddard & Melville, 2004).

A case study design using concurrent mixed research methods adopting both quantitative and qualitative research methods were used in this study because both types of data were collected during the same stage. The purpose of combining qualitative and quantitative research components was to expand and strengthen the study's conclusions. This was in order to gain an objective insight into the factors influencing action and also gather in depth understanding on the process that guide action.

3.3 Target Population

A population of a study is a target group from which the researcher intends to draw responses from. The aim of this study was to establish the framework for digital archives administration. To achieve this, the study targeted 19 archivists and 50 users who were recorded in the register at the time of data collection at the National Archives of Zambia.

3.4 Sampling Technique

Survey, and simple random sampling techniques was used to select archivists and users respectively.

The study adopted the census survey method to select archivists. According to Crawshaw. and Chambers (2015), in a census, every member of the population is surveyed. This method is suitable for a study of this because the population was small. Simple random sampling on the other hand was used to select users. Simple random technique without replacement was used to select users because it provides a chance for every member of the population, of being included in the sample (Kasonde-Ng'andu, 2013). A simple random sample is meant to be an unbiased representation of a group. In this regard, this method was used because it provided each member of the population an equal chance of being selected.

3.5 Sample Size

A sample size of 13 archivists from a total population of 19 archivists working at the National Archives of Zambia in the archives department were selected from all the nine (9) provinces of Zambia: Lusaka (5) Kabwe (1), Choma (1), Mansa (1), Kasama (1), Ndola (1), Mongu (1), Solwezi (1), and Chipata (1) from a total number of 19 members of staff working in the archives administration department. The sample selected was representative based on the fact that it included all the key staff involved in archives administration at National Archives.

Thirty (30) users of archives were selected from a total population of 40 users as recorded in the library register at the time of data collection. Only the 30 users were willing to participate in the study. Generally, it was observed that due to Covid 19, most users shunned the use of the library at the time, as the turnout was very low.

3.6 Data collection

Data collection refers to the process of organizing information that will be used to solve the research problem. It may involve administering a questionnaire, conducting an interview or observe what is occurring among the subjects of study (Kombo and Tromp, 2006). Self-administered semi- structured and unstructured questionnaires and in-depth- interview guides were

used to collect empirical data for the study. The semi- structured online questionnaire contained open and closed ended questions, while the interview guide contained open ended questions.

3.7 Procedure for data collection and timeline

Respondents were grouped into two main groups during data collection. Group 1 included archivists (i.e. Chief archivist, and Senior Archivist, Archivists Assistants based at the National Archives of Zambia head office and 9 Provincial Archivists and Assistant Archivists) and the second group comprised of archives users. Prior permission and clearance was sought from the Directorate of Research Graduate Studies (DRGS) Ethical Committee and from the Chief Archivists at the National Archives of Zambia before the commencement of data collection. Transcriptions of open-ended interviews, open-ended questions and questionnaires were generated. One-on-one interviews were conducted for the key respondents, while an online questionnaire coupled with phone interviews was used to collect data from archivists and assistant archivists in provincial centers.

Open ended questionnaires were sent via email using google forms to the respondents in the provincial followed by phone interviews due to internet challenges experienced as a result of their geographical location. A period of three weeks was used for distribution and collection of the research instruments from the respondents located outside Lusaka.

3.8 Data analysis

Data collected from the field was first transcribed in order to obtain a general sense of the material. After which data were coded into SPSS version 26 for analysis descriptive statistics. Content analysis using themes was used to analyze the outcome from in-depth interviews. The findings where then imported into Excel for generation of frequencies, graphs and tables for easy data presentation and interpretation.

3.9 Ethical Considerations

The researcher sought ethical clearance from the university ethics committee before proceeding with the process of data collection. In order to obtain accurate data from the in-depth interview, the study ensured to get the trust and confidence from the respondents by explaining to them the purpose of the study, and assuring them that their identity and information provided would remain private and confidential. To ensure that this was achieved, the responds were guided not to include their names on the protocols. A checklist on ethical issues was prepared beforehand and the responds were made aware of this list and adherence to its contents was observed. The study also ensured that the participation of the respondents in the study was voluntary. Consent was obtained from the respondents with the intension to record the interview. The study was fully aware of the limitations that recording had regards obtaining adequate information from the respondents on certain sensitive questions, for this reason, once the participant showed unwillingness to be recorded, the researcher ensured that an adequate written record was generated.

3.10 Summary

In this Chapter presented the research design that was adopted in this study. A mixed research method approach was adopted due to provide a balanced basis on which conclusion were drawn for the study. The target population for the study included archivists and users at the National Archives of Zambia. The sampling techniques adopted included purposive sampling for archivists and simple random sampling for the users. A total of 13 archivists were selected and 30 users to participate in this study. The data was collected using closed and open ended questionnaires including interviews. The Data collected was analyzed using SPSS and content analysis. Ethical issues were taken into consideration during this procedure.

CHAPTER 4: PRESENTATION OF RESEARCH FINDINGS

4.1 Introduction

This chapter presents research findings. The chapter is organised under the main themes developed from the research objectives guiding the study: current practices and procedures for digital archives administration; legal and policy framework; challenges encountered in the process of administering digital archive; measures to address challenges of digital archives administration. Data were collected from the Archivists (Chief Archivist, Archivists, Assistant Archivists, Archives Assistants) and Users using face to face interviews, online and print questionnaires.

4.2 Respondents background information

4.2.1 Archivist position in the organization

Archivists were asked to state the position they held in the organisation. According to the findings, 5 Archivists, 3 Assistant Archivist, 3 Archives Assistants, 1 Senior Archivist; and 1 Chief Archivist participated in this study.

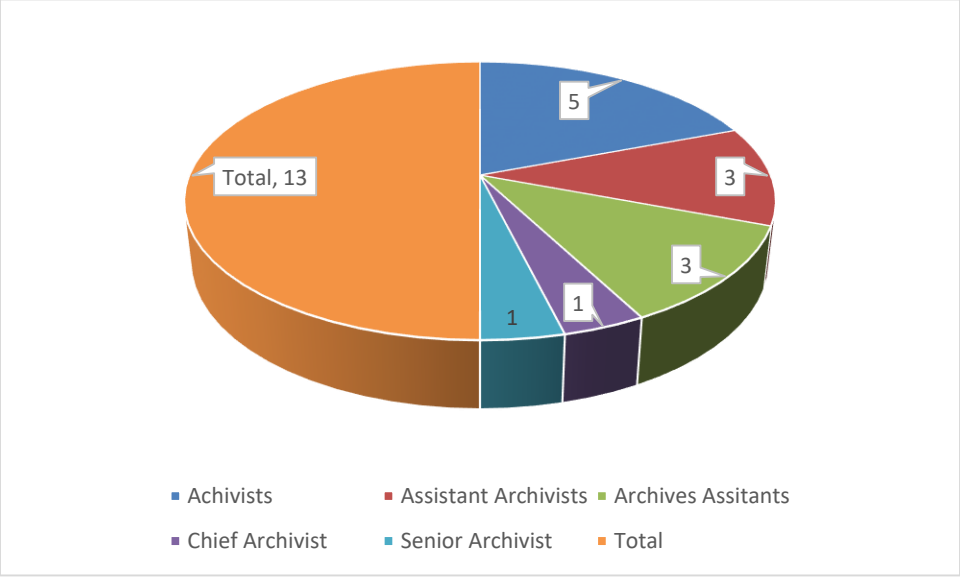


Figure 1: Position in the organisation

4.2.2 Qualifications

When the archivists were asked to indicate their qualifications, 1 had a master's degree, 7 had a bachelor's degree and 5 had a diploma. As such, from the indication from these findings, all the archivists that participated in the study had some basic level of expertise in archives management.

Users were also asked to state their qualifications to ascertain their skills proficiency in accessing digital archives systems. In the order of ranking, the findings show that only 1 respondent had a PhD, 9 had master's degrees, 7 had diplomas and 3 had certificates.

Table 1: Respondents Qualifications

Category	**Qualification**	**Frequency**
Users	PhD	1
	Masters	9
	Degree	7
	Diploma	10
	Certificate	3
Archivists	Masters	1
	Degree	7
	Diploma	5

4.3 Current Practices in Administration of Digital Archives

4.3.1 Digital Archive

Archivists were asked to state what digital archives are, the findings obtained showed that 8 archivists said a digital archive is a converted analogue document into computer readable document, while 3 referred to digital archives as documents that are born digital, 2 said that these are electronic resources either born digital or converted and 1 added that digital archives can also be referred to as use of ICTs to manage archives and electronic resources as shown in Figure 2 below;

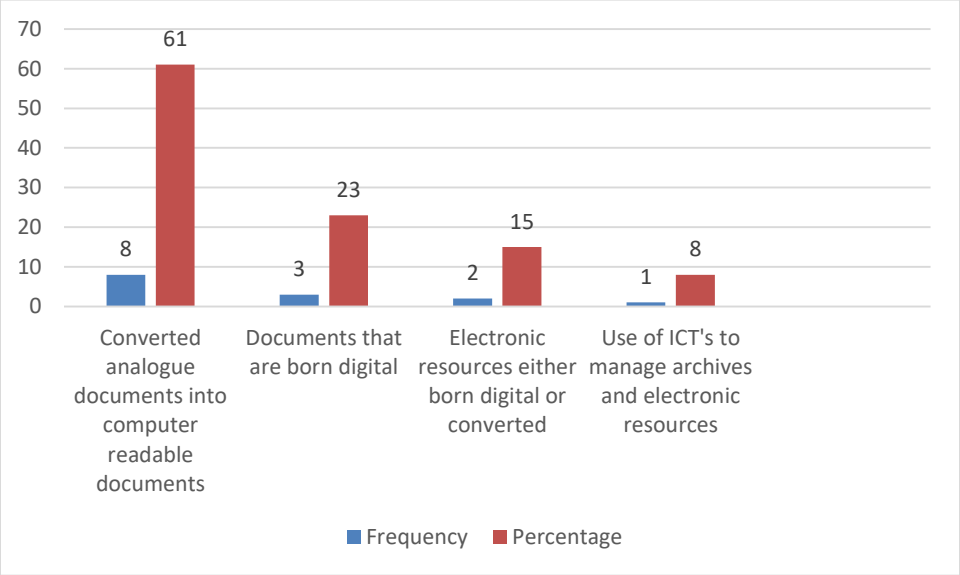


Figure 2: Archivists definition of digital archives

When users of archives were asked to give their understanding of what digital archives are, 18 (60%) said that digital archives are documents that have been converted from analogue to computer readable documents, 9(30%) said digital archives are electronic resources, 5(16.7%) referred to digital archives as those documents that are born digital and 5(16.7%) said paper documents, as shown in the figure 4.3 below;

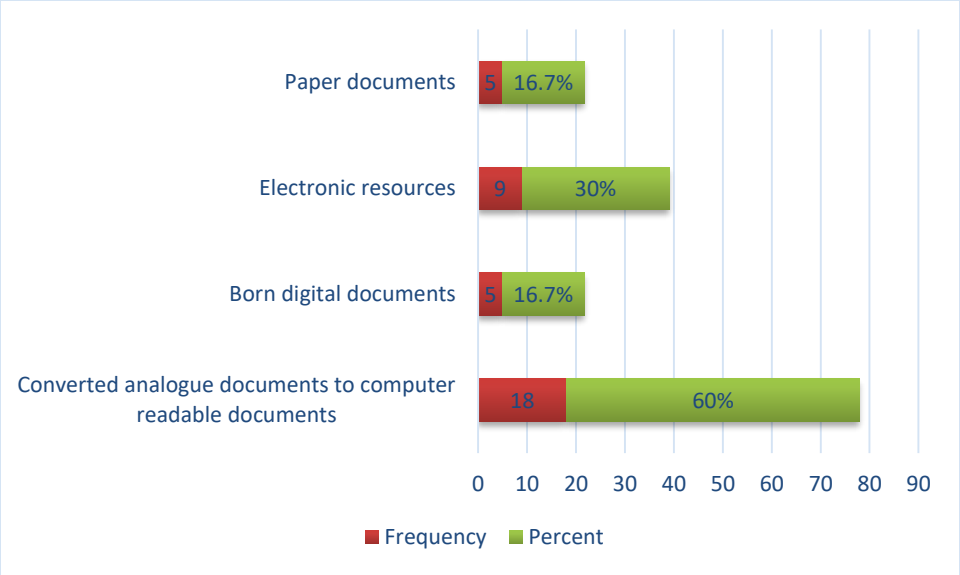


Figure 1: Users definition of digital archives

From the findings indicated in Figure 2 and 3 it was therefore, established that digital archives are converted analogue documents into computer readable documents including those that are born digital and requires the use of ICT's to manage them.

4.3.2 Digitised archives

Archivists were asked to indicate the type of archives that have been digitised at NAZ. According to the findings; 5 archivists said, newspapers, district note books and photographs/pictures, 4 archivists said, BSA company collection, 2 archivists said, rare books, and 2 archivists said microfilms, audio, and stamps. Table 2 below is a summary of the findings;

Table: 2 Digitised archives at NAZ

SN	Digital Archives at NAZ	Frequency
1	Newspapers, district note books, and photographs/pictures	5
2	BSA company collection	2
3	Rare books	2
4	Microfilms, audio and stamps	2

From the findings presented, it was there established digitised archives at National Archives of Zambia included, newspapers, district note books, photographs or pictures, BSA company collection and rare books.

In the same regard, users were asked to indicate the forms of digital archives available at NAZ, 15(50%) said images, 12(40%) multimedia, 12(40%) audio, and 5(16.7%)text. Figure 4.4 is a summary of the findings;

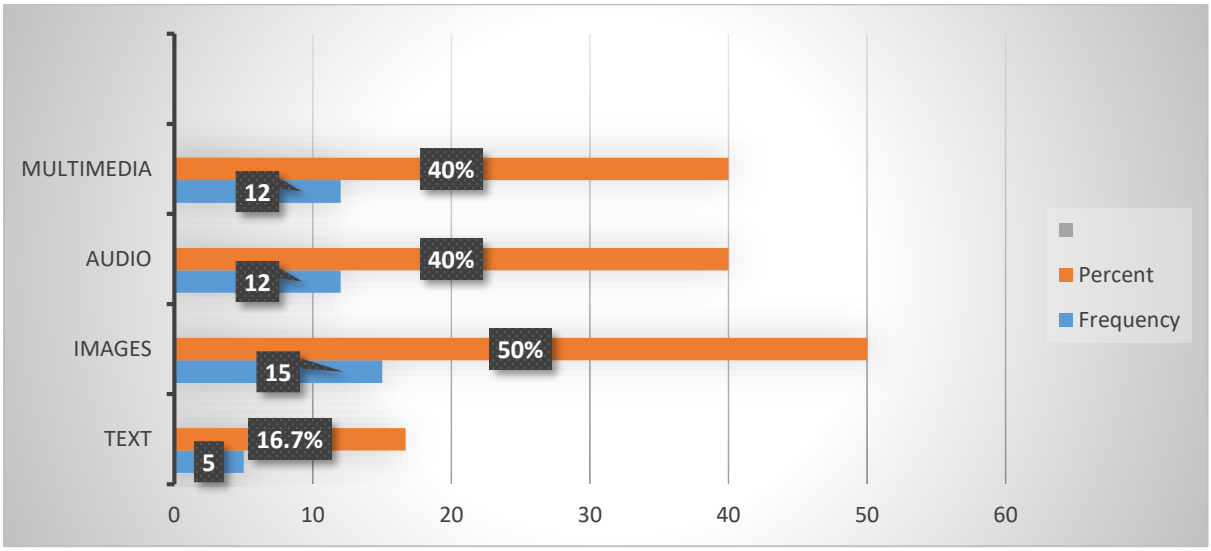


Figure 4: Forms of digital archives at NAZ

As such, the study established that the digitised archives at NAZ are preserved in the form of images, audio and multimedia.

4.3.3 Preferred form of archives

Archivists were asked to indicate the users most preferred form of archives. Majority (10) archivists said users preferred traditional print documents, while 3 archivists said users preferred digital documents.

Further, when users were asked to state their preferred form of archives, 15(25%) said traditional print documents, and 15(25%) said digital documents.

The study therefore established that both traditional print documents and digital documents were preferred by the users. Although, mostly traditional print documents were more preferred.

Users were, asked to state the reasons for their preference. Some responses obtained from user's whose preference was for digital format were as follows; the responses were coded from U1 to U30 to represent key findings that were obtained from users;

> U1 said, digital *archives are easier to access at a click of a button you are able to find the information you are looking for*,
>
> U2 said, it *is cheaper to store digital archives; you do not need a lot of space just for storag*e;
>
> U3 said, s*torage of a record can be done on the cloud and be accessed from different locations across the world*, and
>
> U12 said, I *prefer digital archives because they can easily be stored on a flash and microfilm, this makes it easier for me to access the digital archives*.

Responses were also obtained from the Users whose preference were traditional print archives;

> U5 said, *accessing digital archives requires a lot of resources such as data to access internet which affects accessibility*;

U6 said, *as a historian reading traditional paper records helps me with context and visualisation;*

U10 said, *I feel that it directly connects one to the past and it proves the truth beyond reasonable doubts because it is physical*.

Based on the foregoing statements it was therefore established that both forms of archives were preferred by the Users. Digital archives were preferred because of easy retrieval, quick access, and cheap storage. While traditional print archives were preferred because of their originality in providing context and visualisation.

4.3.4 Users qualification and preferred form of archives

A further analysis to compare the user's qualifications with their preference for digital archives to establish whether qualifications had any influence on their preference between traditional print archives and digital archives was conducted. Findings obtained revealed that the users who participated in this study had the following qualifications matched with their preference; 3(10%) users with certificates preferred digital archives, 5(16.6%) with diplomas preferred both digital and traditional print archives, 4(13%) with degrees preferred traditional paper archives, 6(20%) with master's degrees preferred traditional print archives and 1(3%) user with a PhD qualification indicated that they preferred digital archives as shown in Table 4.4 below;

Table 3: Cross tabulation for Users qualification and preferred form of archives.

		Preferred format of archives		
		Traditional paper archives	Digital archives	Total
highest qualification	Certificate	0	3	3
	Diploma	5	5	10
	Degree	4	3	7
	Masters	6	3	9
	PhD	0	1	1
Total		15	15	30

Based on the findings presented in Table 3, it was established that qualifications had little or no influence regarding the users preferred form of archives.

4.3.5 Electronic equipment used to access digital archives

When users were asked to state the type of electronic equipment used to access digital archives, 22(73.3%) said computers, 14(46.7%) said cameras, 6(20%) stated scanners and 5(16.7%) said printers as summarised in the figure 5 below;

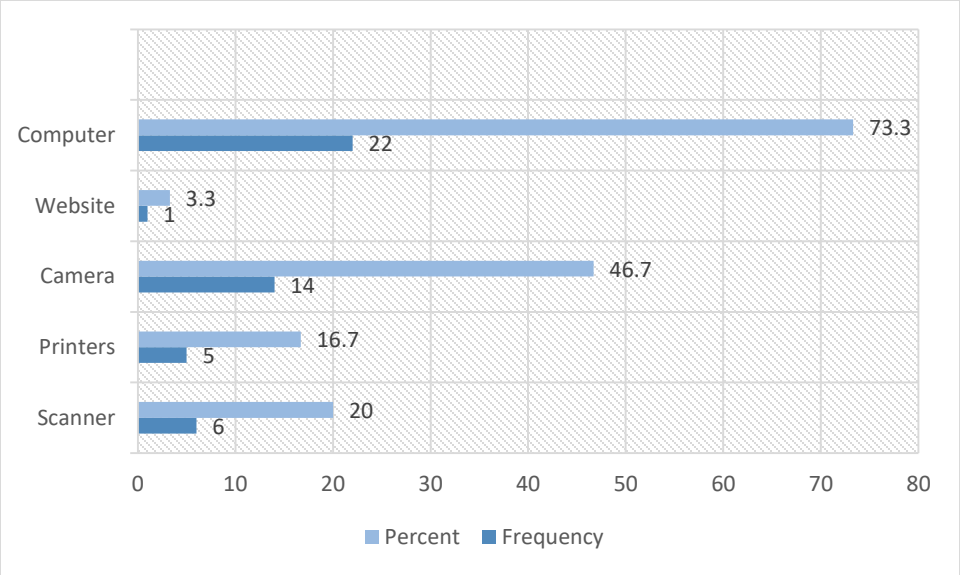


Figure 5: Electronic equipment used to access digital archives

As such it was therefore established that users used computers to access digital archives at the National Archives of Zambia.

4.3.6 Frequency of access

Archivists were asked to state the frequency of accessing digital archives by the users. According to the findings, 4 Archivists said not frequently, 3 said once a while, 3, and 3 did not respond as shown in Figure: 6 below:

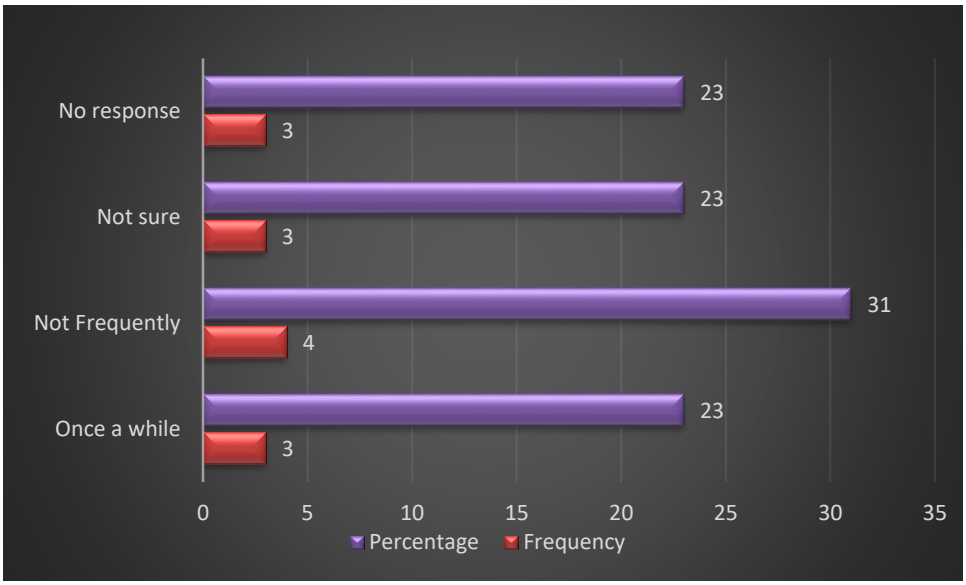


Figure 2: Archivists responses on user's frequency of accessing digital archives

When users were asked to state their frequency of accessing digital archives from NAZ, 5 (16.7%) said, frequently, while 9(30%) said, not frequently, 1(3.3%) said, very frequently and 14(46.7%) said once in a while as shown in Figure 7 below;

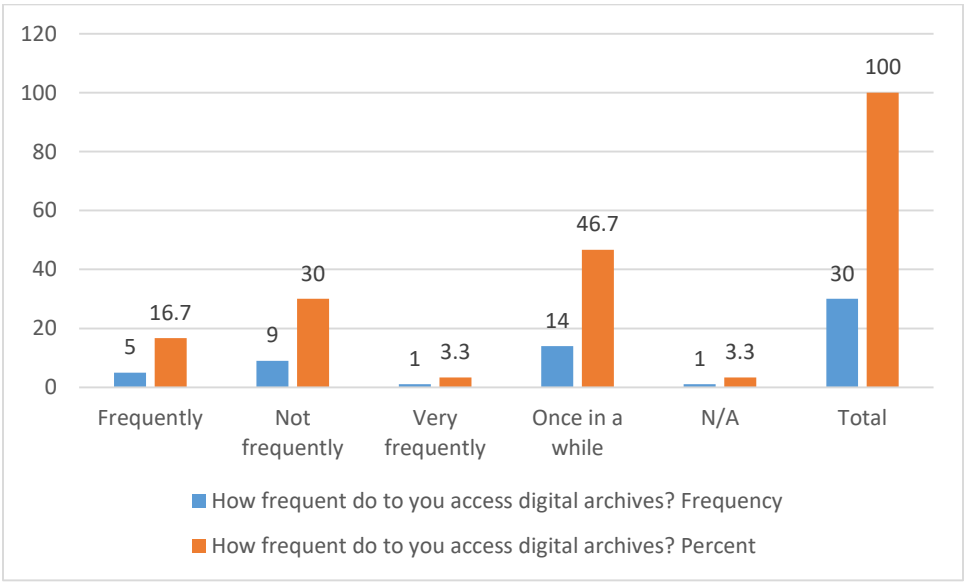


Figure 3: Frequency of accessing digital archives

From the findings presented in Figure 7, the study therefore established that digital archives were rarely accessed by users at NAZ. This finding is similar with the findings obtained from Archivists who also indicated that digital archives were not frequently used.

4.3.7 Factors affecting effective access to digital archives

When users were asked to state some of the factors that affect effective access to digital archives, 19(63.3%) said inadequate infrastructure, 17(56.7%) said lack of adequate skills, 17(56.7) said lack of IT equipment, 10(33.3%) said user friendly software, 9(30%) said digital system are not easy to manipulate and 7(23.3) said lack of training as summarised in Figure 8 below;

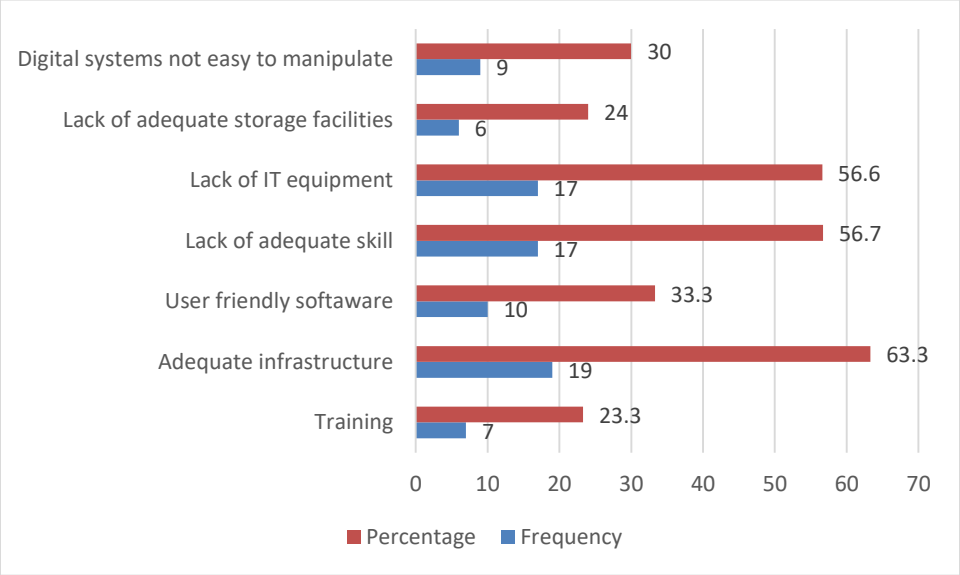


Figure 4: Factors affecting digital archives

From the findings as presented in Figure 8, the study established that inadequate infrastructure and lack of IT equipment mainly were factors hindering effective access to digital archives at NAZ.

4.3.8 Creation and storage of digital archives

Archivists were asked to indicate how the digital archives were created. The study established that all the 13 archivists said that the digital archives were converted from print documents to digital documents.

Archivists were further asked to indicate the type of electronic equipment used to create digital archives, findings from archivists were coded from A1 to A13, to represent archivists key responses as follows;

> *A1 said, "the Bookeye scanner (Book drive DIY), image photograph scanner, canon drive and electronic storage device for photographs was used to scan the images."*

> *A4 indicated that, "All scanned documents were put on a database using Alchemy software to index and to record the digital information onto the digital repository."*

> *While A2 said, "two terminals were put in the search room for users to access the digitalised documents."*

Therefore, the study established that the type of equipment used to digitalise the archives at National Archives of Zambia included a book scanner called Bookeye (Book drive DIY), and image photograph scanner.

4.3.9 Digital software application systems used to digitalise archives

Archivists were asked to indicate the digital application systems that were used to digitise archives. The findings established showed that all (13) the archivists said that the digitised archives were stored on a database using Alchemy software.

4.3.10 Archivists involvement in the processing of digital archives

Archivists were asked to indicate if they were responsible for processing digital archives from creation to storage stage. From the findings, 5 archivists said they were not involved, 7 said that they were involved in the process of digital archives but only at the point of dissemination and 1 did not give an answer as shown in the Figure 9 below;

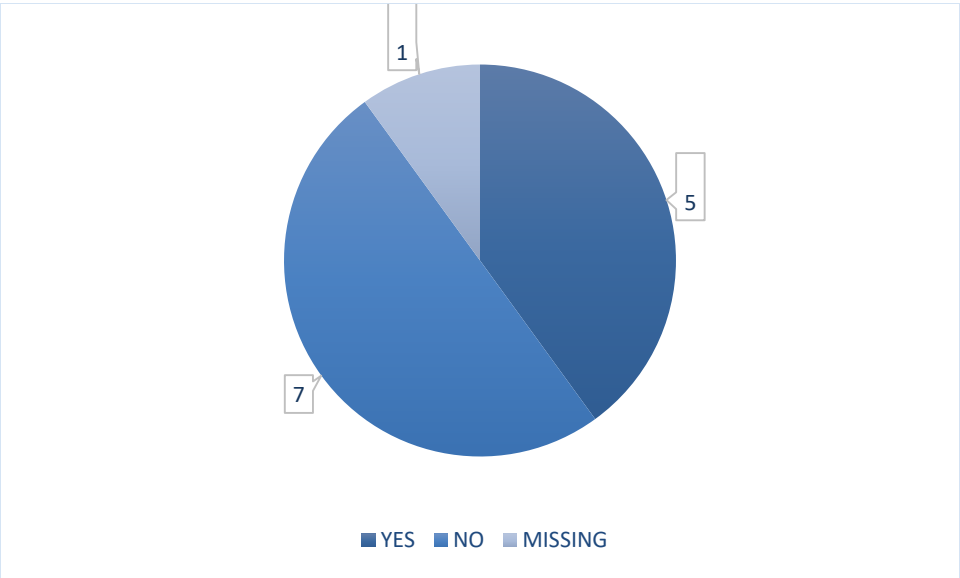


Figure 5: Involvement in processing of digital archives

Further, archivists were asked to state who was responsible for the creation of digital archives. In response to this question, most (10) of the archivist said that;

> A project team was constituted to handle the digitalisation project under the office of the Director. Among them was a Historian and an IT specialist. Unfortunately, the team members who were trained and involved in the project left National Archives of Zambia as soon as the project was completed thereby creating a gap in terms of required skills for handling digital records.

From the foregoing statements, it was therefore established that archivists were not involved in the digitalisation project, but rather the department had engaged consultants.

4.3.11 Standard format for processing digital archives

Archivists were asked to state whether there was a standard format for processing digital archives at NAZ. It was revealed that the department was yet to establish standard procedures for processing digital archives including retention schedules, for instance one archivists

A 3 said;

> *For digital archives, standard procedures are yet to be established*

including the retention period for born digital documents for appraising them..

4.4 Policy and Legal framework

4.4.1 Policy framework

Archivists were asked to indicate the policy and standard procedures guiding the administration of digital archives at NAZ. All (13) archivists indicated that;

> Currently there was no institutional policy to govern digital archives adminstration.

Therefore, it was established that there was no policy guidelines to govern the adminstration of digital archives at the National Archives of Zambia.

4.4.2 Legal Framework

Archivists were further asked to state the legal framework guiding NAZ in the administration of digital archives, all the (13) archivists said that the institution by mandate was guided by CAP 175 of 1995 of the Laws of Zambia.

4.5 Challenges

4.5.1 Challenges affecting effective digital archives administration

Archivists were asked to state the challenges affecting effective digital archives administration at National Archives of Zambia, the following responses emerged;

> A 13 said, there *was a skills gap which was created because the people who were trained on the project had since left and these were IT specialists instead of records officers,*
>
> A 3 said, *lack of a standard software to ensure uniformity and application of common standards for retention of borndigital archives across all government minstries,*
>
> ` A1 said *the Alchamy software was a commercial softaware which was very expensive to maintain which led to the discontinuity of service provision by the servivce provider*

A5 said, *inadeqaute funding to procure and maintain softaware; inadequate ICT infrastructure, staff lacking technical skills required to administer digital archives effectively and lack of digital management policies and procedures:*

Therefore, it was established that there was a skills gap in handling digital archives. This was because staff in the archives department lacked technical skills required to administer digital archives effectively. However, other challenges identified included the lack of a standard software to ensure uniformity and application of common standards for retention of borndigital archives across all government minstries, expensive maintence costs for the softaware for managing digital archives, inadeqaute funding to procure and maintain softaware and inadequate ICT infrastructure and, lack of digital management policies and procedures.

4.5.2 Challenges affecting access to digital archives

Users were asked to state the challenges encountered when accessing digital archives. Accordingly, 21(70%) said that the major challenge they faced when accessing digital archives was inadequate IT infrastructure, 11(36.7%) of the respondents who indicated inadequate ICT skills while, 10(33.3 percent) said poor network connectivity and 2(6.7 percent) said lack of training. Figure 4.10 below shows a summary of the findings;

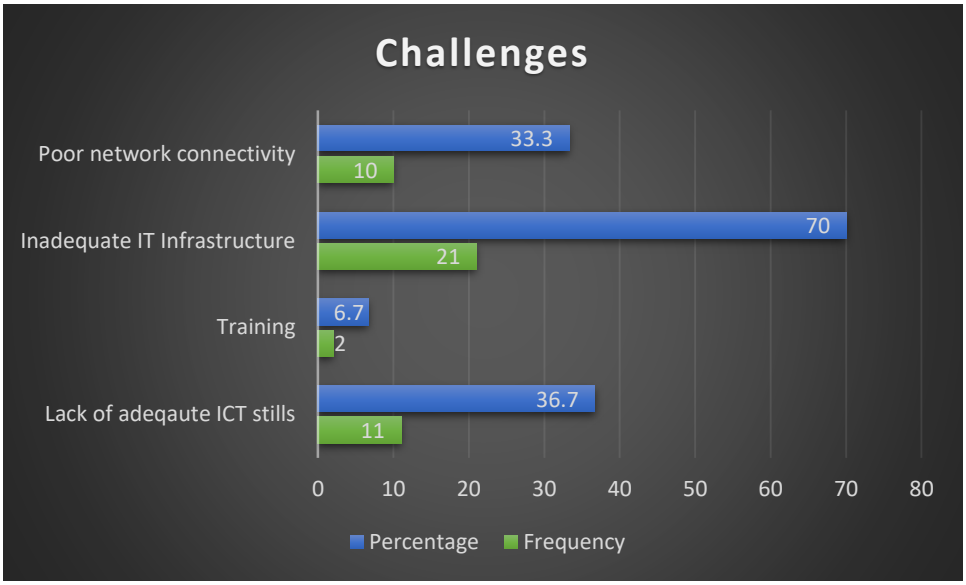


Figure 6: Challenges affecting access to digital archives

Therefore, the main challenges affecting users access to digital archives were inadequate IT infrastructure, inadequate ICT skills, poor network connectivity and lack of training.

4.6 Measure to address the challenges of digital archives administration

Archivists were asked to suggest measures to address the challenges affecting digital archives administration at NAZ.

The following statements emerged;

> A1 said, *Improving IT infrastructure for storage of digital archives;*
>
> A2 suggested that, *there is need to develop policies and procedures to guide the process of digital archives administration at NAZ;*
>
> A3 indicated, *training of key members of staff in handling of digital archives*
>
> *A5* said, *the funding towards digitisation projects must be increased to enable the institution procure more IT equipment; The institution needs to develop a website that will be linked to a database for online access based on subscription.*
>
> A9 in addition proposed that *all public institutions should use a uniform tailor made software for born digital archives for easy transmission and uniformity;* and

As such, it can be stated therefore that some of the measures suggested by archivists mainly included training of key members of staff in handling of digital archives, improving IT infrastructure for storage of digital archives, developing policies and procedures to guide the process of digital archives administration at NAZ and increasing the funding towards digitisation projects to enable the institution procure more IT equipment among others.

Users were also asked to state some measures for addressing the challenges affecting access to digital archives. Responses obtained showed that, 14(46.7 %) users said there was need to have proper IT infrastructure at NAZ, 9(30%) users indicated the need to train users, and 3(10%) said

users should be allowed to access computers and enforce security measures on the system. Further responses were obtained from some users who indicated that;

> U1 said *there was need to provide a step by step guide to accessing digital information on the website*
>
> U2 said *there is need for more funding to buy equipment,*
>
> U3 indicated the need for *preservation of new forms of digital archives to include interactive narratives and e-books,*

Therefore, the study established that management at NAZ needs to provide proper IT infrastructure to improve access to digital archives. In addition, a step by step finding aid to digital resources and preservation of new forms of digital archives that include interactive narratives and e-books.

4.7 Summary

This chapter presented research findings obtained from the archivists, and users. The study established a number of issues regarding the framework for digital archives administration at National Archives of Zambia. Digital archives in this study were referred to as converted analogue documents into computer readable documents including those that are born digital and requires the use of ICT's to manage them. The types of digitised archives at NAZ include district note books, photographs, rare books, newspapers, maps, stamps, and the BSA company collection. These documents are preserved in the form of images, multimedia, audio, and electronic text. Both traditional print documents and digital documents are preferred by the users.

In addition, the institution is guided by CAP 175 of 1995 of the Laws of Zambia. However, currently the institution does not have policies and procedure to guide the processing of digital archive. The challenges identified affecting effective digital archives administration were lack of skills in the administration of digital archives, lack of IT infrastructure and a software for admistration of digital archives, lack of policies and procedures, high cost of software maintenance and inadequate funding, poor network connectivity. The measures proposed for addressing the challenges to effective administration of digital archives included training, acquisition of IT infrastructure, decentralisation of the IT department, training of both creators of records and

archivists, acquisition of a common software, creation of finding aids and development of institutional policies and procedure for processing of digital archives.

CHAPTER 5: DISCUSSION OF FINDINGS

5.1 Introduction

This chapter discusses the findings established in chapter four. The chapter has been organised under main themes generated from the objectives guiding the study, current practices and procedures for digital archives administration; challenges affecting effective digital archives administration; measures for addressing challenges to digital archives administration.

5.1.1 Background to the study

The study sought to establish archivists level of proficiency in handling digital archives at the National Archives of Zambia. The study established that 7(53%) archivists had a bachelor's degree at National Archives of Zambia. Having right qualifications is key to enhanced performance in an organisation. In a similar study, Mulauzi, Wamundila, Mtanga, and Hamooya (2012), emphasized the need for organizations to invest in skilled e-records and archives managers for effectiveness. Although the level of proficiency in handling Information Technology was not assessed, it was however, expected that with their current qualifications, they would be in position to handle digital archives with minimal difficulties. However, it can also be argued that information is dynamic and as such the need to continuously upskill is necessary despite the initial training that formal education provides. The subject on digital archives is a relatively new phenomenon especially in developing countries. Therefore, it calls for more continuous development for the archivists to be effective at managing e-records.

6.2 Current practices procedures and prospects for digital archives administration

The point of departure was to establish the meaning of digital archives in the context of the study. Archivists were asked to state what digital archives were. The major findings established showed that 8(61%) archivists said digital archives are converted analogue documents into computer readable documents that requires the use of ICT's to manage them. Similarly, Helsp, Davis and Wilson (2002) pointed out that digital archives are mediated by technology and to experience digital records a person must have a right combination of hardware and software. Both studies point to the need for organisations to develop their technological infrastructure to be able to convert

the analogue collection and make them accessible using computer applications. This seems to limit the extent to which the administration of digital archives can be managed effectively.

Archivists were further asked to indicate the types of digitised archives at the National Archives of Zambia. It was established that the types of digitised archives at National Archives of Zambia were newspapers, district note books, photographs or pictures, rare books and the BSA company collection among others. In the same regard, users were asked to indicate the forms of digital archives available at NAZ, 15(50%) users said images, multimedia, audio, and text. This is similar to the findings established by Tsvuura & Ngulube (2020) who noted that the digitalised content can be in form of text, images, audio or multimedia. The digitised archives at NAZ is preserved mainly in the forms such as images, texts and multimedia. The form in which documents are preserved is important as it promotes access to the digitised content. If the form is preferred and accepted, users should be able access the collection with minimal challenges.

As such, the study further investigated user's preference in terms of forms of archives. Archivist and users were asked to indicate the most preferred format of archives by the users. Accordingly, 10(77%) archivists, said users preferred traditional print documents, while 15(50%) users said they preferred traditional print documents and 15(50%) said that they preferred digital documents. In this regard both forms of archives were preferred based on different reasons. Those whose preference were traditional documents explained that some of them lacked resources required to access digital archives, and others said they preferred print documents because of their originality in terms of visualisation and contextualisation among other reasons. This finding is similar to findings established by Davis-Perkins et al. (2005) who revealed that there are inherent problems with keeping the same level of value in a digital surrogate, in that the processes of reproduction always changes the materiality of the object that has been reproduced. Although the use of digital editing is widespread amongst technology practitioners there is not always a record kept of the changes made and the extent to which manipulation is acceptable. Photographs especially may be altered and the originality lost in the process of editing.

Other reasons obtained from users whose preference were digital archives include, ease of access, cheaper storage using online media and convenience to access documents from anywhere regardless of someone's location and time. Similarly, a study by Tsvuura & Ngulube, (2020),

established that the inclusion of digital archives into an institutions collection carries with it a number of benefits addressing some of the challenges archivists and users face in their daily activities such as access to information, handling of documents, wear and tear including storage space. Coupled with technological advancement that seem to dictate new trends in information management. Both forms of archives in this context are preferred, however, it should also be stated that the challenges faced by most information providers is that due to the advancements in technology, the world has evolved. Digital information seems to be taking centre stage, information can now be accessed at a click of a button. Yet most national archives still lag behind in providing digital content and moving at the pace of the evolution. There is need therefore, for archivists to strike a balance between digital and print collections in order to cater for the information needs of both types of users adequately. Systems must be put in place to ensure that these efforts are supported effectively and access is enhanced.

The study went ffurther to compare the user's preference of form of archives and their qualifications. It was established that qualifications had little or no influence regarding the users preferred form of archives. Although there was an indication that some users lacked the necessary ICT skills needed to access digital archives effectively. This could be attributed to the preference of documents in print format. Deliberate efforts by archivists in this case therefore, is required to effectively orient the users in accessing the digital content, as much as traditional print documents. As such, the purpose of undertaking a digitisation project should not be based on replacing print or traditional archives but rather should be centred on enhancing access, storage and service provision.

In determining the frequency of access to digital archives, archivists and users were asked to indicate the rate at which the users accessed digital archives. From the findings, 4(31%) archivist said that digital archives were not frequently accessed, while 14(46.7%) users said they accessed digital archives once in a while. In another study, Hamooya, Mulauzi and Njobvu (2012) reported that in as much as researchers were able to access digitized information at the National Archives of Zambia, they did not know initially that most of the historical information was digitised. An indication that digital archives were rarely accessed and utilised by users at the National Archives of Zambia at the time the study was undertaken. This could be associated with lack of awareness about the digital collection stored in the archives among the factors hindering access.

Moreover, users were asked to state factors affecting access to digital archives at National Archives of Zambia. The findings showed 19(63.3%) inadequate IT infrastructure and lack of training. In a similar study, Alkhofani, et al. (2019), emphasised the need for IT infrastructure to effectively administer digital archives in an organisation, they identified key factors to include, top management support, implementation team and user involvement, policy and procedures, training, adequate budget, communication and willingness, ease of use, IT infrastructure and technical support. Although the study established that efforts were made by National Archives of Zambia to digitise the archives in 2005, the institution only had two computer terminals for users to access the digitised archives. It was reported that when a user requested for a digital record, the conservators would retrieve the information on behalf of the users. This is an indication of clear inadequacy of the IT equipment available. Otherwise, the ideal situation would require users to access the digital content independently. To greater extent, this may have affected access to the digital archival collection negatively. Notwithstanding, other factors that could be at play that may be affecting effective access to digital archives.

In addition, archivists were asked to indicate the type of electronic equipment which was used to create, store and access digital archives. Archivists 13(100%) said that computers and scanners, mainly were used to digitalise the collection. Specifically, some of the respondents said the Bookeye (Book drive DIY) scanner, and image photograph scanner were used. The digitalised archives were stored on a database using Alchemy software. Although the findings also revealed that the digitalised content are now stored on a computer databases following the withdraw of the Alchemy Software by the vendors as a result of failure to maintain the subscription by NAZ which was considered as costly venture to maintain. This was attributed to the fact that the institution mainly depended on commercial or proprietary software for the management of digitised archives. However, National Archives of Zambia should take advantage of the presence of Free Open Source Software(FOSS) information management systems. Most information providers have now turned to the use of FOSS to offer information solutions to their clientele. With the adoption of Open Source Software to administer digital collections, the only cost the institutional may have to bear is the cost of configuration and installation as no subscription maybe required.

The study further wanted to establish if the archivists were involved in the digitisation project at the National Archives of Zambia. In this regard, archivists were asked to state if they were involved

in processing of digital archives from the creation to storage stage. The findings established that, 7(53%) archivists were not involved in the process of digital archives, except at the point of dissemination. Instead, a project team was constituted to handle the digitalisation project under the office of the Director. Somehow, this can be used as a basis to explain the reason why most archivists indicated that they were not well vexed in handling digital archives. Although the OAIS model puts the archivists at the centre of managing the digitisation process from ingestions, preservation and administration of the systems etc. The model in this regard can be used to benchmark standard practice. It recommends six components providing a common understanding of what it is that archives do when they preserve digital records. Institutions however, use different strategies to implement certain agendas such as digitisation project. Outsourcing seemingly is the quickest and one of the most effective way to achieve the goals of a project. However, an institution must strive to achieve ownership of the project by its members for the project to succeed. It is said that the only constant is change, resistance to change in organisation as such is inevitable. However, employee involvement on the other hand is seen as one of the strategies to overcoming resistance to change. The case of the National Archives of Zambia and the challenges to effectively implement the digitisation project could as such be associated to resistance and lack of employee ownership of the digitisation project.

Archivists were asked to state whether there is a standard format for processing digital archives at National Archives of Zambia. Majority 11(84.6%) of the archivists said standard procedures are yet to be established including the retention period for born digital documents for appraising them. However, Raivo, (2005) established that the National Archives of Canada was probably the first to issue clear requirements for electronic documents and records management system used in the government agencies. While the National Archives of Australia maintained an online manual on designing and implementing a records keeping system (DIRKS). On the other hand, Ahmed and Sharma (2021) revealed that none of the archives National Archives of India (NA) and Delhi Archives(DA) uses any protocols for search and retrieval of records of re-use digital records at the client level which is similar to the Zambian (National Archives of Zambia) context. This was associated to the lack of legal systems designed to ensure that the management of digital archives is guided by standard practices that are internationally recognised world over. This is why DCC life cycle model also places emphasis on planning for preservation in line with the established policies and standards as a key component in the curation cycle. However, the absence of standards

and procedures greatly affects performance of an organisation in the manner in which service is delivered. Mostly, employees are not compelled to adhere to standards as may be required by management.

5.3 Policy and Legal Framework

The study wanted to find to out if the National Archives of Zambia is supported by policy and legal framework for the administration of digital archives. Archivists were asked to state the legal framework guiding NAZ in the administration of digital archives. The findings established from 13(100%)archivists that the institution by mandate was guided by CAP 175 of 1995 of the Laws of Zambia. However, it was also pointed out that the institution does not have an institutional digitisation policy for managingof digital archives. Similarly, in another study, Hamooya, (2009) noted that initially, the department was established under the National Archives Act of 1969 Cap 268 of the Laws of Zambia. The National Archives Act was further revised under Cap 175 of 1995 of the laws of Zambia. However, Hamooya (2011) further noted that despite the Act being revised 1995, it had not kept pace with the trends in the information industry as it does not reflect the administration of digital archives adequately. This is because the mandate of NAZ as stipulated in the laws of Zambia, does not provide a specific framework for archives administration in electronic format. This is seen as a limitation because NAZ has a mandate to the preserve archives mainly in print format. However, the OAIS model somehow addresses this challenge by giving important impulses to move towards greater standardisation in the field of digital archiving, including the development of criteria and procedures to analyse and asses digital archival and dissemination practices. These provisions are important for preparedness towards digital archives management. Although the adoption of the OAIS model, might partly solve the problem of institutional policy issues, the model still may not adequately cover the gap in the legal framework for digital archives administration in Zambia. An affective legal framework, provides ground for implementers to compel submitters of information to adhere to the laws of the country. As it is, the current law does not compel creators of records to electronically submit records for permanent preservation.

5.4 Challenges affecting effective administration of digital archives

The study investigated the challenges affecting effective administration to digital archives. Archivists were asked to state some of the challenges affecting effective digital archives

administration at the National Archives of Zambia. The findings from archivists 8(61.5%) revealed that there was a skills gap which was created because they were not trained to manage digital archives during the implementation of the project. The archivists indicated that they were lacking IT skills necessary to handle digital archives. Similarly, Alkhofani, Yusof, et al. (2019), identified training as key factor that influences effective digital archives administration. Hpwever, the failure to administer digital archives effectively at the National Archives of Zambia was attributed to the fact that archivists and their assistants were not trained in handling digital collections. In as much as most of them indicated that they had qualifications at degree level, this was not surprising as effective manipulation of a software requires adequate training and orientation for both the user and the staff. This is besides the basic computer skills that one possesses.

5.5 Measures to address challenges of digital archives administration.

Archivists and users were asked to recommend measures to address challenges affecting digital archives administration at National Archives of Zambia. The findings established showed that most 11(84.6%) of the archivists recommended training of key members of staff in handling of digital archives, while users 14(46.7 %) indicated the need to have proper IT infrastructure. A similar study by Mulauzi, Wamundila, Mtanga, and Hamooya (2012), emphasized the need for organizations to invest in skilled e-records and archives managers for effectiveness. The skills set required for effective e-records management include, records and information management skills, managerial skills, and project management skills. While, Alkhofani, et al., (2019) proposed measures to enhance electronic records management to include organisational factors such as project management, organizational factors, human resources, and IT infrastructure. The four categories outline a holistic approach to the successful implementation of digital archives. Training of archivists in handling of digital archives is cardinal to effective implementation of the digitization project. However, the digitized content needs to be made available to the users through various IT infrastructure and application which must be adequate for the all the users to access them.

5.6 Summary

The chapter discussed several issues in line with the themes generated from the objectives of the study. The section under current practices, procedures and prospects brought out issues on the status of digital archives including standards, procedures, accessibility and storage. The chapter went further to discuss findings on policy and legal framework and challenges of digital archives administration. The study established that the National Archives of Zambia was yet to develop standards and policy guidelines to guide the administration of digital archives. The major challenges faced by the archivists that affect effective implementation of digital archives included lack of training, and inadequate IT infrastructure as proposed by the users. Finally, the chapter discussed measures to address the challenges. Some of the measures recommended to address the challenges affecting digital archives administration were training of archivists and the need to improve the IT infrastructure at the National Archives of Zambia.

CHAPTER 6: CONCLUSION AND RECOMMENDATION

6.1 Introduction

This chapter concludes the study "A *framework for digital archives administration in Zambia: current practices, procedures and prospects*" and makes recommendations for possible consideration and implementation by management at NAZ and policy makers. The study was guided by the following research objectives:

i. To find out the current practices and procedures employed in the administration of digital archives at the National Archives of Zambia.
ii. To explore the legal and policy framework underpinning digital archives administration.
iii. To establish challenges that affect the effectiveness of digital archives administration at the National Archives of Zambia.
iv. To determine measures for effective digital archives administration at the National Archives of Zambia.

A conclusion on each objective was made as follows:

6.2 Conclusion

The National Archives of Zambia has a preserve of both print and digital archives in its collection. However, the department has not yet developed standard procedures and manuals to guide the administration of digitised archives. Although the department has the necessary digitisation equipment including Bookeye and photograph image scanners that are adequate to handle the digitisation of the entire archival collection, the National Archives of Zambia does not have a software to manage digital archives.

While National Archives of Zambia draws its mandate according to CAP 175 of the Laws of Zambia, the National Archive Act of 1995 does not provide adequate legal ground to manage digital archives adequately. Further, the National Archives of Zambia does not have an institutional policy to govern the administration of digital archives and electronic records.

The study concluded that archivists were lacking skills required to adminster digital archives effectively. In addition, it was also concluded that the lack of adeqaute IT infrastructure hindered effective access and usage of digital archives.

Strategies for enhancing effectiveness of digital archives administration at the National Archives of Zambia proposed, were training of archivists and acquisition of adequate IT infrastructure among others. The IT infrastructure development should not only address hardware components but software applications for processing and accessing digital archives.

6.3 Recommendations

The study recommended the following measures for effectiveness in digital archives administration at the National Archives of Zambia:

i. The institution should build capacity of its key staff who are involved in handling digital archives. Orientations for creators of records and users should also be scheduled especially once the new systems are place to promote usage and access.
ii. National Archives of Zambia should prioritise the acquisition IT infrastructure including hardware and software to support the administration of digital archives.
iii. The Ministry of Home Affairs should decentralise the IT department so that National Archives of Zambia can address some of its IT issues effectively.
iv. The institution should develop policies, manuals and procedures for the successful administration of digital archives.
v. There is need to develop a flexible cost effective system for processing digital archives. The institution should consider developing an Open Source Software (OSS) instead of a commercial software for project sustainability. The system should have standard features that can be used across different departments and managed locally by qualified staff with IT skills.
vi. The study recommends a model "*Framework for Digital Archives Administration in Zambia"* developed from the study for adoption by National Archives of Zambia.

Model /Framework for Digital Archives Administration in Zambia

The following model was developed to guide the process of planning creation, storage and preservation of digital archives at the National Archives of Zambia. This model provides a context in which the digitisation project in an organisation can be undertaken.

Basically, the model comprises of five procedural steps; information needs assessment, planning, resource mobilisation, systems design and implementation and monitoring and control through which the process of planning and implementing a digital preservation project can be effectively managed. The model puts into consideration key factors that are key for effective digital archives administration such as assessment of information needs, planning, funding, human resources, IT infrastructure development, policies procedures and manuals, training, systems design, implementation and control.

Figure 6.1: Digital Archives Administration Process Model

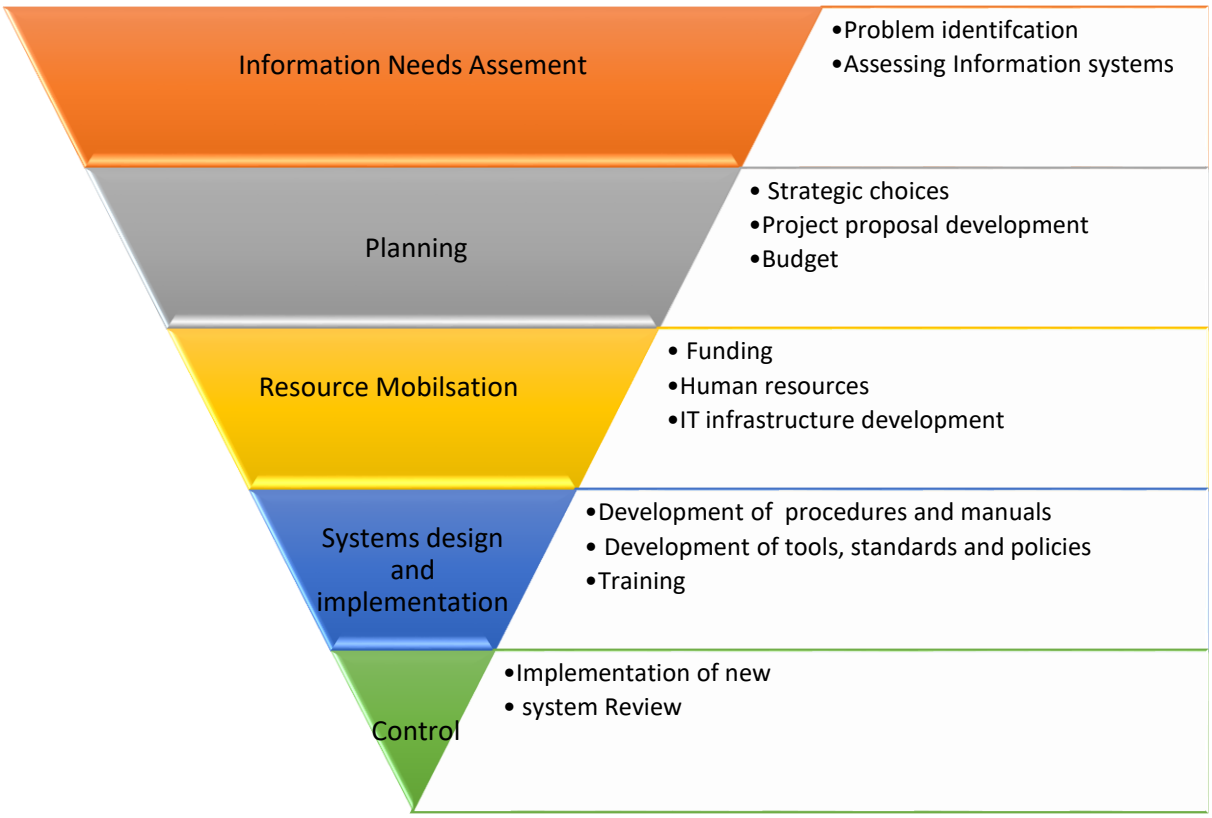


Figure 6.1 presents an outline of five key stages that must be considered for successful implementation of an institutions digital records and archives system. The stages are explained below:

Step 1: Information Needs assessment

This element entails an organisation taking stock of its internal as well as external environment factors in order to assess the needs gap in service provision. The gap could arise from changes in perception and meaning including social and economic trends. For an organisation to remain relevant, it must remain aware of its environment at all times and ensure that it continues to provide relevant services regardless of the changes. Once the information gap has been established, information managers need to critically analyse and assess the extent to which the gaps or weakness identified will affect service provision negatively or positively. If the weaknesses identified maybe detrimental to the wellbeing of the organisation, then deliberate plans must be developed to forecast the future course of action to address them.

Further evaluation of the library facility or information centre in relation to the current systems available should be conducted. This will help to determine if the department or organisation really does need a new system and the type of system that should be implemented to meet the needs of the organisations.

Step 2: Strategic choices

Making strategic choices depends on the establishment that a problem exists and that needs intervention**.** Sometimes, organisations may undertake strategic planning as a means to introduce new products and services or expand the existing product lines**.** Information managers may from time to time adopt new practices and introduces new products and services to their clients for improved service delivery**.** To archive this**,** this stage requires the development of a project proposal with focus on key areas such as the organisational overall vision, goals and objectives of the project, timeframe, resources required, skills needed for implementation, infrastructure development, and a budget**.**

A well-crafted project plan will help to attain management support and attract possible funding for the project because all the necessary information needed for consideration before embarking on a project are brought before management for consideration. The organisation should consider alternatives available for addressing the problem identified. This will entail coming up with strategies that will drive the institution from its current status to the desired position**.**

Step 3: Resource mobilisation

Among the resources required for successful implementation include, finance, IT infrastructure and skills. Information managers need to establish the main source of funding for the institution and its adequacy in undertaking the project at hand. Other sources of financing can be considered, resources can be mobilised through private partnerships agreements, collaborations and networks. However, it is always much easier firstly to plan within what the institution can afford, while considering other sources.

Implementing a digitisation project is a costly venture for an institution to undertake. As such, all possible options for financing available must be explored for such undertakings to be successful. In addition, there is need to identify the human skills that are needed for the success of the project. If the skills can be tapped from the organisations pool, or if the skills should be tapped from external sources should be determined by a skills audit. However, depending on which option is suitable, it is important that the key stake holders in the organisation are involved from the initiation stage so that they own the project and for continuity sake.

Step 4 : Systems design and implementation

Having established the problem that need to be addressed, information managers at this point need to have a system designed tailored to meet the organisational needs. To achieve this, there is need to develop tools that will help in describing resources, enhance access and retrieval of digital information. The tools required include, Meta data, manuals and procedures for ingesting digital objects onto a system.

The information manager also needs to decide the type of hardware and software components required to put in place to address the information needs adequately. Issues regarding user interface and access too should have addressed at this stage. It is also important to be aware of the different

Integrated Library Management Systems (ILMS) available of the market. Careful evaluation of different software's should be taken as these should be designed to meet the current informational and organisational needs. Managers can choose to either invest in a commercial software that maybe a once off purchase or subscription based. Other software options available include Free Open Source Software's that can be downloaded and configured locally.

Once this is completed, the system will need to be launched and put to use. However, effective usage will depend on training of the users and orientation of creators of records and archives.

Step 5: Control

Continuous monitoring and control measures of the digital archives and records management system will need to be put place. Effective control will help to minimise deviations that can affect achievement of the project goals. Usage of the new systems also should be constantly monitored. At this point security measures needs to be put in check to make sure that only the rightful intended audience access the digital information on the system. Back up measures are also important at this stage because digital information is fragile and may need external storage facilities to prevent loss of information. The usage of the informational resources will also need to be checked regularly through formal reports. The policy will act as a benchmark for guiding the monitoring of the implementation phase. Diversions from standard practice should be controlled immediately they are identified.

Therefore, it is recommended that the National Archives of Zambia should review the proposed models and procedure for possible implementation or further enhancement in line with its organisational goals and values. This framework once developed can be used as a standard for digital archives administration in Zambia by all organisations that handle information and work in collaboration with the National Archives of Zambia for permanent preservation of their records.

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APPENDICES

Appendix 1: Questionaire for Archivists

"**A Framework for Administration of Digital Archives in Zambia: Current Practices, Procedures and Prospects.**"

INSTRUCTIONS

1. Please answer all questions and if you are in doubt, seek clarification from the researcher/ research assistant.
2. Tick the answer that express your view as shown
3. Only one response is required for each question

SECTION A: BACKGROUND INFORMATION

4. Position ……
5. Indicate your highest qualification?
    a. Certificate
    b. Diploma
    c. Degree
    d. Masters Degree
    e. PhD

SECTION B: CURRENT PRACTICES IN ADMINSTRATION OF DIGITAL ARCHIVES?

6. Digital archives include;
    a) Analogue documents converted into computer readeable documents [ ]
    b) Born digital archives [ ]
    c) Electronic resources [ ]
    d) Paper documents [ ]

7. Indicate the type of digital archives you are familiar with in your organisation?

   ……

   ……

   …….

8. Which format of archives are prefered and used mostly by the users

   a. Traditional paper records [ ]

   b. Digital archives [ ]

9. How frequent do users access digital archives?

   a. Frequently [ ]

   b. Not Frequent [ ]

   c. Very Frequent [ ]

   d. Once in a while [ ]

10. How are these digital archives created?

    ……

    ……

    ……

11. Indicate the type of electronic equipment used to create digital archhives?

    ……

    ……

    …….

12. What digital applications systems do you use to store the digital archives ?

    ……

    ……

    ……

13. Are you responsible for the capturing, creation, storage, and disssemination of digital records?

    a. YES [ ]

    b. NO [ ]

14. If NO to Q 13 above, indicate who is responsible for capturing, creating and storing digital records in your institution?

    ……
    ……
    ……
    ……

15. Is there a standard format that has been set on how digital archives should be created,stored and disseminated in your institution?

    a. YES [ ]
    b. NO [ ]

SECTION C : <u>FRAMEWORK FOR ARCHIVES ADMINSTRATION</u>

16. Are there policy guidelines and standard procedures or manuals for digital archives adminstration in your institution?

    ……
    ……
    ……

17. What Legal Act currently governs digital archives adminstration by the National Archives of Zambia?

    ……
    ……
    …….

SECTION D: <u>CHALLENGES OF ADMINSTERING DIGITAL RECORDS</u>?

18. Challenges to effective digital archives adminstration include the following:

    a. Lack of adequate skill [ ]
    b. Lack of IT equipment [ ]
    c. Lack of adequate storage facilities [ ]
    d. Digital systems not easy to manipulate [ ]
    e. Lack of records management policy [ ]

f. Other

specifify……

……

……

……

……

19. Suggest any measures for addressing the challenges highlighted above when managing digital records?

……

……

……

……

THANK YOU FOR YOUR COOPERATION

Appendix 2: Online Questionaire for Users

"**A Framework for Administration of Digital Archives in Zambia: Current Practices, Procedures and Prospects."**

INSTRUCTIONS

1. Please answer all questions and if you are in doubt, seek clarification from the researcher/ research assistant.
2. Tick the answer that express your view as shown
3. Only one response is required for each question

SECTION A: BACKGROUND INFORMATION

4. Indicate your highest qualification?
    a. Certificate [ ]
    b. Diploma [ ]
    c. Degree [ ]
    d. Masters Degree [ ]
    e. PhD [ ]

SECTION B: CURRENT PRACTICES IN ADMINSTRATION OF DIGITAL ARCHIVES?

5. Digital archives include;
    e) Analogue documents converted into computer readeable documents [ ]
    f) Born digital archives [ ]
    g) Electronic resources [ ]
    h) Paper documents [ ]

6. Do you access digital records from the National Archives of Zambia?
    a. YES [ ]
    b. NO [ ]
7. If the answer to Q6 is YES, indicate the format of digital archives you are familiar with?
    a) Text []
    b) Images []
    c) Audio []
    d) Multimedia. [ ]
8. Which format of archives do you prefer?
    a. Traditional paper records [ ]
    b. Digital archives [ ]

9. How frequent do you access digital archives?
    a. Frequently [ ]
    b. Not Frequent [ ]
    c. Very Frequent [ ]
    d. Once in a while [ ]

10. Indicate the type of electronic equipment used to access digital archhives at the National Archives of Zambia?
    a) Scanner [ ]
    b) Computer [ ]
    c) Printers [ ]
    d) Camera [ ]
    e) Other
    specify……..

11. In your view what factors affect effective access to digital archives?
    a) Lack of adequate ICT skills [ ]
    b) Training [ ]

c) Inadequate ICT Infrustructure [ ]

d) Poor network connectivity [ ]

e) Other

specify……

……..

12. Challenges to effective usage of digital archives include the following:

a. Lack of adequate skill [ ]

b. Lack of IT equipment [ ]

c. Lack of adequate storage facilities [ ]

d. Digital systems not easy to manipulate [ ]

e. Other

specifify……

……

……..

13. Suggest any measures for addressing the challenges highlighted above when managing digital records?

……

……

……

THANK YOU FOR YOUR COOPERATION